THE COMMON GOOD AND ACCESS TO REMOTE SENSING DATA

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DEDICATION

To my family.

ABSTRACT

The thesis represents a search for the appropriate regime for protecting remote sensing data and information. Based on the technical and societal characteristics of this type of data, it argues in favour of the necessity to secure access to it. Using the regulatory examples of the USA and Europe, the research compares the effectiveness of such relevant legal regimes as intellectual property protection, in particular, copyright on the one hand, and the regulation of public sector information on the other. On the basis of this analysis the argument is made, that the unnecessary commodification of remote sensing data through private property-like protection regime will adversely influence their use and diminish their value. The principle of sharing, based on the theories of common property and the common good, is proposed as the best and most appropriate solution to avoid development of such a scenario. Its viability and effectiveness lies in the emphasis on the balance between the private and the public in the achievement of the common good of a better life that today manifests itself *inter alia* in being information rich. The principle of sharing has survived centuries of philosophical thought and is relevant today, particularly with regard to the establishment of the protection and distribution regime for remote sensing data, as the highlighted examples of geographic information infrastructures and the Geographic Earth Observation System of Systems show. The metaphor of information as a waterway rounds up the discussion regarding the relevance of the principle of sharing and emphasises the indispensability of the access-to-data oriented approach to the regulation of relationships over the generation, distribution and use of remote sensing data and information.

RÉSUMÉ

Cette thèse se veut une recherche du régime adéquat de protection des données de télédétections et de l'information. Son argument, en faveur de la nécessité d'en sécuriser l'accès, se base sur leurs caractéristiques techniques et sociétales. En prenant comme exemples les États-Unis et l'Europe, cette recherche compare l'efficacité de régimes légaux pertinents telle que la protection de la propriété intellectuelle, en particulier celle du droit d'auteur d'une part, et la régulation du secteur public de l'information, de l'autre. Sur la base de cette analyse, ce travail soutient qu'une marchandisation non nécessaire des données de télédétections par des régimes de protection, telle que celui de la propriété privée, vont influencer défavorablement leurs utilités ainsi que leurs valeurs. Le principe du partage, basé sur les théories de la propriété commune et du bien commun, est proposé comme étant la solution pour éviter de tels scénarios. Sa viabilité et son efficacité résident dans l'accent mis entre l'équilibre public et privé dans l'accomplissement du bien commun d'une vie meilleure, qui se manifeste aujourd'hui notamment par l'abondance de l'information. Le principe de partage, qui a survécu à des siècles de pensée philosophique, est toujours pertinent aujourd'hui, particulièrement en ce qui concerne l'implantation de régime de protection et de distribution des données de télédétections, tel que les exemples donnés sur l'infrastructure de l'information géographique et le ''Geographic Earth Observation System of Systems'' le montrent. La métaphore qui présente l'information comme une voie navigable reprend la discussion relative à la pertinence du principe de partage et accentue l'aspect indispensable d'une approche orientée vers l'accès aux données, préférable à la régulation des relations sur la génération, la distribution et l'utilisation de données de télédétections et de l'information.

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Contents

Introduction

Using remote sensing satellite data as an example, this thesis is about the treatment of information. More precisely, it is about the modern society being information rich and the possibility of extracting the best of accessible information. This research is driven by the necessity to find a balance between treating information as a commodity and as a resource contributing to the achievement of the common good. Its main objective is to find the most appropriate way to reconcile the private interest to protect data and information on the one hand and the public need to have access to them on the other. Approaches to setting up the framework of access to and use of remote sensing data and information are the primary focus of the analysis, but the issues it addresses may be relevant to other types of information, provided that they have similar characteristics to those of remote sensing data.[1]

Data and information become more important for the operations carried out by various economic actors, consumers, governments and other users. For this reason, today the issue of access to them is of utmost importance. If appropriate conditions of acquiring or using data and information are absent, are not articulated enough or differ substantially across jurisdictions the decision-making processes regarding different activities that involve utilisation of data and information, and their outcomes can be hampered. Without going into the details of the debate as to whether the contemporary international community or at least some of its members have entered the new phase of development, the so-called information society,[2] it can hardly be disputable that information plays a vital role in our lives. The "information age", which at least societies of the developed countries entered in the late twentieth century together with the digital revolution, is marked by a very important economic factor –

[1] Like e.g. geographic information or scientific data and information in general.

[2] For a general and interesting discussion of the different views as to the foundations and elements of an information society *see* Webster, F. *Theories of Information Society* (London: Routledge, 1995).

information processing became one of the most significant business activities.[3] The collection, arrangement and presentation of information are indispensable to all market players, end consumers, and states themselves.[4] These activities form now a new industry or a market niche at the very least.

Digital technology, as one of the elements of the information society, has also greatly facilitated collection, storage, presentation, dissemination and use of comprehensive collections of information, and has changed the pattern of its arrangement to render searchability as the main principle of set-up and functioning of such collections.[5] The ease at which data and information can be stored, found, transferred and used contributes to their status as indispensable components of economic and practical decision-making in various areas of activities. Information is more extensively used as an application: to support and make more efficient such activities as construction, road planning, expansion of business and even farming,[6] to name just a few. The wide range of data and information use diversifies their types and the sources of their generation, and leads to the development of more highly processed and sophisticated products tailored to meet the needs of specific users or to satisfy the narrow purpose of their application. As the result information becomes a valuable asset and is treated as a commodity subject to treatment according to market conditions, just like any other traditional good and service.

At the same time, due to the technological development on the one hand, and to the promotion of the values and principles, upon which democratic societies are based on the other, more information is generated to support planning of activities and to shape policies that governments and their bodies carry out and adopt. Such information is also

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[3] Russell, P. *The Global Brain Awakens: Our Next Evolutionary Leap* (Miles River Press, 1999) Chapter 8.

[4] Colston, C. "Sui Generis Database Right: Ripe for Review?" (2001) 3 *J. Info. L. & T.* 4. Online: <http://elj.warwick.ac.uk/jilt/01-3/colston.html> (last accessed 01.02.2011).

[5] Lloyd, I. *Information Technology Law* 2nd ed. (London: Butterworths, 2004).

[6] "Multi-Satellite Imaging Helps Farmers Control Costs and Boost Yields" *EOMag* (January, 2009). Online: <http://www.eomag.eu/articles/800/multi-satellite-imaging-helps-farmers-control-costs-and-boost-yields> (last accessed 01.02.2011).

used to help societies develop and prosper, as well as to prevent events that may negatively affect them or mitigate losses from them. Disaster management[7] is one of the most vivid examples of using data and information for such purposes. It is worth noting that often the same data and information can be used to achieve private business goals and meet humanitarian needs. The public or humanitarian aspect of information use serves as evidence that information, even if treated as a commercial good, is at the same time an indispensable resource for the well-being and development of the society at large.

As mentioned earlier, remote sensing data and information are the type of information on which this research focuses in particular. These data contain information about the Earth and are gathered by satellites from outer space. Advancement of space technologies, increased capacity of satellites to generate data, as well as the improvement of remote sensing techniques and of the quality of remote sensing data have contributed to the fact that often they are an indispensable part of overall geographic information utilised today. It goes without saying that remote sensing is an important space tool for observing the Earth – "for monitoring, measuring and understanding the Earth's terrestrial, aquatic and climatic environments, as well as how they are changing and how each reacts to human influence".[8]

Satellites can generate views of the entire planet, without the constraints imposed by political or geographical frontiers, thereby leading to the growth of new markets in data and data distribution.[9] The resolution of modern satellites that generate remote sensing data accessible on the market is as high as fifty centimetres,[10] which means that objects of this size are identifiable on the processed images. Such precision provides more

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[7] Lewis, S. "Remote Sensing for Natural Disasters: Facts and Figures" *Science and Development Network* (November 11, 2009). Online: <http://www.scidev.net/en/features/remote-sensing-for-natural-disasters-facts-and-figures.html> (last accessed 01.02.2011).

[8] Tatem, A.J., Goetz, S.J. & Hay, S.I. "Fifty Years of Earth-Observation Satellites" (2008) 96:5 *American Scientist* 390.

[9] *The Cambridge Encyclopaedia of Space: Missions, Applications and Exploration* (Cambridge, New York: Cambridge University Press, 2003) at 4.

[10] Resolution of the data generated by civilian satellites. Military satellites probably are capable of generating data of even better spatial resolution.

details and dramatically increases the value of remote sensing data and information derived from them. The market for remote sensing data is evolving and expanding its services from, among other activities, online mapping, forestry, agricultural and environmental studies, to support for news-making, shipping, and real-estate. The increasing market value of remote sensing data on the one hand, and their significance as a resource access to which has to be secured for the societal purposes on the other, necessitate the determination of their legal status: both generators of data and their users need to know the scope of their rights and obligations with regard to the data in question.

The overall increase in the use of data and information, as well as of the variety of sources of their production (in terms of sensors, devices and ownership) bring forward the "dualistic" attitude towards them – or a twofold status – as was emphasised earlier: on the one hand remote sensing data and information are a valuable commodity and on the other are often an essential source of information for making decisions affecting functioning of societies. As this research shows, the legal framework of treating remote sensing data and information in particular and other types of geographic and scientific data in general is driven by these two viewpoints that are often presented as opposite to each other, and is manifested in the regime of tight intellectual property protection and public sector information accordingly. It is the main argument of this research that a proper balance between the two should be found for further successful generation and use of remote sensing data, as well as for the development of the relevant market. Importance of remote sensing data for different users[11] must be taken into account when deciding what regime suits best to protect them, notwithstanding that such a step most certainly will add complications to the regulatory regime chosen. For this purpose the research analyses whether the right to access remote sensing data should be recognised, and if yes what its scope should be – whether this right should encompass

[11] Such as the research community, decision-makers or businesses.

all types of data, only certain types, or only primary data.[12] The reason to search for the new regime is explained by the fact that the current situation with the proper protection of remote sensing data and information is far from being clear and suitable for all players involved.

The main reason for this is that the increasing demand for data and information of various kinds coupled with their digitisation has resulted in strengthening proprietary rights of their owners by virtue of technological protection measures and other mechanisms available in the digital environment. Such a stretch in fact led to granting monopoly rights or at least certain proprietary rights, in factual information.[13] This trend lacks a legitimate foundation because the substantive provisions of intellectual property regulations, especially those regarding copyright protection – unconditional prohibition to protect content of and ideas underlying works – remain in principle unchanged.[14] Even the exception of the technological protection measures cannot be seen as the justification to protect facts, as they refer and are designed to protect copyrighted works in accordance with the principles that make the core of the regime and thereby deny such protection.

The growth of different forms and the expansion of the scope of intellectual property rights seem unstoppable,[15] and these rights cover new subject-matter. The importance of this body of law lies in the fact that the rules of intellectual property law in general and copyright law in particular have the greatest impact on the handling of remote

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12 As per the United Nations (UN) *Principles Relating to Remote Sensing of the Earth from Outer Space* G.A. Res. 41/65 Annex. U.N. Doc A/RES/41/65 (1986) [Remote Sensing Principles]. They are discussed in the next chapter.

13 This practice, most vividly manifested in the Member States of the European Union (EU) through introduction of the *sui generis* database right. *See* EC, *European Parliament and the Council Directive 96/9/EC of 11 March 1996 on the legal protection of databases* [1996] *O.J. L* 77/20-28 [Database Directive].

14 Although the details of e.g. copyright protection continue to evolve and are modified to properly addressed the technological and other developments.

15 Hugenholtz, B.P. "Copyright and Freedom of Expression in Europe" in Dreyfuss, R.C., Leenheer Zimmerman. D. & First, H. eds., *Expanding the Boundaries of Intellectual Property. Innovation Policy for the Knowledge Society* (Oxford: Oxford University Press, 2001) 343. Online: <www.ivir.nl/publications/hugenholtz/> (last accessed 01.02.2011).

sensing data and information by both private and public actors. Therefore, these norms should answer questions regarding data ownership and status: whether primary data are copyrightable, whether the deployment of computer programmes provides enough creativity to render the processed data copyrightable and finally, whether archiving can create copyright database protection rights. But due to certain specificities of remote sensing activities, as well as of remote sensing data themselves,[16] traditional intellectual property and copyright law is incapable of addressing all the issues related to their generation, use and distribution. This inability results in the legal uncertainty regarding protection of remote sensing data that in its turn leads to an over-reliance on various other protection mechanisms ranging from copyright and *sui generis* database right (where applicable), through to know-how and contract. One of the main premises of this research is that such "protective overload" is not an appropriate tool to shape the regime governing the generation, use and distribution of remote sensing data and information.

The greatest problem regarding the applicability of copyright rules to remote sensing data is that it is questionable whether these data as such, or at least some of their types, meet the creativity/originality criterion. This criterion is universally recognised through the Berne Convention for the Protection of Literary and Artistic Works[17] as the basis for the copyright protection: only "literary and artistic works" that are created with a certain degree of skill and novelty fulfil the criterion of being a creative work and are thus subject to protection. Hence, ideas, processes, methods of operation, including data, do not fall within the ambit of copyright protection.[18] Remote sensing data contain factual information and are generated automatically by satellites and special computer programmes. After initial acquisition they are subjected to processing. Consequently, it is very well possible that they are not eligible for copyright protection at all.

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16 They are referred to in detail later on in this research and for this reason are not addressed here.

17 Paris Act of July 24, 1971, as amended on September 28, 1979. 1161 *U.N.T.S.* 3, Article 2 [Berne Convention].

18 Arts. 2, 5 *World Intellectual Property Organisation (WIPO) Copyright Treaty*, December 20, 1996, 36 *I.L.M.* 65 [WIPO Copyright Treaty].

These characteristics of remote sensing data make them an information "guinea-pig" for the analysis of the applicability of intellectual property law to assets, the mode of creation of which does not necessarily fit the traditional framework of the regime. The "grey-zone" intellectual assets sharply demarcate the problem with the creativity criterion that copyright sets as one of the indispensable conditions for protection. The technical or automated nature of remote sensing data generation and subsequent analysis require the assessment of the level of creativity that these assets possess for the determination of the intellectual property availability to protect them. The current stage of remote sensing activities makes pertinent the search for the best-suited legal regime of protection of remote sensing data and information in the more general context of protection and conditions of use and distribution of factual data and information.

The non-appropriateness or non-applicability of copyright protection for certain types of remote sensing data explains the efforts to protect them through other regimes such as licensing and the *sui generis* database protection in Europe. These efforts often result in the aforementioned overprotection, as the data are claimed to be encompassed by the copyright laws and regulations, by the norms concerning trade secrets and confidential information, as well as falling in every individual case under protection provided by data distribution contracts, which often extend the level of protection that would be available under the current copyright regime as it is.[19] It is important to assess whether such ways of appropriating factual data and information are legitimate, as there may be better alternatives to address the issue of the distribution and use of remote sensing data and information. Although this research is limited to the analysis of remote sensing data and their status, it touches upon the issue of copyrightability of factual data and information in general, taking into account the broader effect of the new technologies on understanding traditional paradigm regarding intellectual property rights in general and copyright in particular.

[19] On the treatment of data by remote sensing data generating and distributing companies, *see infra* Chapter 2.

Intellectual property protection is not the only regime that governs the issues around remote sensing. Laws and regulations governing the status and conditions of access to and use of public sector information have a significant impact on handling remote sensing data and information, as most of the sources of their generation today are public in nature. States and their bodies are funding, launching and operating most of remote sensing satellites on the one hand, and are the biggest purchasers of remote sensing data generated by purely private satellites on the other. Unlike copyright and other intellectual property protection regimes, regulations regarding access to and use of public sector information are largely based on the principle of free and unrestricted access to and use of data and information that have such status. The analysis within this research shows that there are differences in the details of the regulations among different jurisdictions, like for instance the methods of defining public sector information or public bodies that produce or hold it, as well as the restrictions on access to it. Nevertheless, it is characteristic that the principle of free and unrestricted access to information remains the underlying basis of treating public sector information. As the result, this legal regime considers information a resource open to sharing rather than a purely proprietary asset.

Intellectual property protection and the regime of access to and use of public sector information are two very distinct regimes that may be applicable to the same data sets and information, including remote sensing data. Which one is more appropriate? Are they mutually exclusive? Exploring the differences in approaches helps this research to elaborate upon the positive and negative sides of each regime and point out aspects that can be complimentary to each other in achievement of the overall goal of balanced protection of proprietary interests and the necessity to secure access to remote sensing data and information for their optimal use and increase of their value.

It is the premise of this thesis that the balance can be achieved if the unjustified tightening and stretching of intellectual property protection is terminated and more consideration is given to the notion of sharing, particularly taking into account the fact

that extensive use and exchange of remote sensing data and information increase their value and contribute to the development of the market for geographic information products. The research argues in favour of turning to the principle of sharing based on the theory of the common good and common aspects of use of private property that initially was developed by Aristotle.[20] The analysis of the milestones of the theories of the common good and common property (and their impact on the content of private property rights and the modes of their use) as elaborated by Aquinas, Grotius, Hobbes, Pufendorf and Boyle is conducted in order to retrieve the similarities among thinkers of different time periods and underline the continuity of the idea of the necessity to share to achieve the common good of prosperity and better life within a society.

The purpose of sketching major property theories that justify the existence, legitimacy and even primacy of common property, and their application to such intellectual property assets as data and information is to draw common notions and approaches to the treatment of data and information that each thinker brings forward. In this regard the idea of common ownership as a foundation of property, together with its influence on the establishment and enforcement of private property rights, receives special attention. Most of the authors support the existence of the concept of the common ownership, or even something to which any notion of ownership is not applicable, and view such a state of affairs as necessary. Following this premise the philosophers bring forward the notion of the common good, which should guide the establishment of the private property regimes and the exercise of private property rights. The explanation for this lies in the argument that for a proper functioning of a society, private and public interests have to be balanced as the achievement of private happiness is impossible without the good of the society as a whole.

[20] Aristotle, *Politics*. trans. Jowett, B.(New York: Cosimo Inc., 2008). *See* also Keys, M.M. *Aquinas, Aristotle, and the Promise of the Common Good* (Cambridge: Cambridge University Press, 2006); Lametti, D. "The Objects of Virtue" in Alexander, G. & Peñalver, E. eds. *Property and Community* (New York: Oxford University Press, 2010) 1-37 [Lametti, "The Objects of Virtue"].

The work of James Boyle is used to bridge the theory of the common good and common property with the regime of protection of intellectual property objects in general and remote sensing data and information in particular. Boyle turns his attention to the concept of the commons that is central to the process of the creation of copyrighted works and other objects protected by virtue of intellectual property regulations. This brings his scholarship closer to that conducted by the philosophers of the past. His arguments reinforce the premise that no one creates works of authorship from scratch; that it is inherent to an intellectual property protection regime that all intellectual property assets eventually and inevitably go to the realm of the public domain, and that the use of ideas, which requires access to works, cannot be restricted in accordance with the traditional interpretation of and philosophy behind intellectual property regulations. It is therefore important to keep in mind the use-aspect of intellectual property assets. If nobody uses data and information, unless they represent a trade secret or information of the similar sort, their value will diminish and their owners will not be able to get return from the creativity, time and effort they spent to produce them in the first place. For this reason the interests of the user community have to be taken into account when shaping the regime of access to and use of remote sensing data and information.

One of the main incentives to turn the discussion to the issue of the common good and of sharing as instrumental to it is to show that – humanitarian by nature – such reasoning constitutes an appropriate basis for adopting regulations regarding data and information protection, and may produce viable economic results as well as or may be even better than the foundations of an economic and proprietary character that are aimed exclusively at protecting the ownership interests of data generators. The applicability of the theories of the common good, common property and of the principle of sharing to remote sensing data and information is assessed based on the discussion regarding their nature, technical characteristics and potential societal value that their use may have.

The notion of the common good emphasises the importance of the principle of sharing that can affect the modes of distribution of data and factual information. Facts, and thereby remote sensing data,[21] as well as other types of information comparable to them, are expressly not within the ambit of copyright protection in virtually all international copyright protection instruments and national statutes. Privatisation of remote sensing data and information may well become a hurdle to both the development of the remote sensing activities and of the market for remote sensing data and information. Therefore, recognition of the right to access remote sensing data and information is the way to ensure that they are not being appropriated through the unjustified claim of copyright or other intellectual property protection regimes or "locked" by restrictive licensing mechanisms and technical protection measures.

Application of the principle of sharing based on the idea of the common good to the use of remote sensing data and information is not a purely theoretical exercise, as sharing is in fact the best way to utilise information in practice. Sharing enables the existence and is an element of the successful functioning of geographic information systems (GIS) that have revolutionised the approach to visualisation of geographic data, their processing, storage and exchange. The practical impact of the integration of the principle of sharing based on the theory of the common good into the functioning of such systems is shown on two examples: that of GIS themselves and of the Geographic Earth Observation System of Systems (GEOSS). Their success can be hampered if the goal to protect the private interests involved alone shapes the legal regimes governing their implementation and existence. The analysis of GIS and GEOSS highlights the argument that private property is not the only and sometimes not the best form of protecting certain assets, in particular those that contribute to the greater good of the society as such.

The examples of GIS and GEOSS are of particular relevance to this research for several reasons. Firstly, they integrate remote sensing data and information. Secondly, he

[21] At the very least primary and initially processed.

existence and availability of such infrastructures and systems encourage production of information and its timely provision, on which many different players heavily depend nowadays. Thirdly, the effort is underway to adopt the rules of data exchange within GEOSS based on the principle of free and unrestricted access to and use of data and information within the created system. The analysis of both GIS and GEOSS allows the development of the argument in favour of treating information infrastructures as the waterways for the modern society. Therefore, parallels to the regime of access to waterways are considered when reflecting upon the right to access remote sensing data.

The waterway metaphor, that in application to allocation of property rights utilises the concept of the common good, rounds up the discussion of the necessity to provide access to remote sensing data, in particular when integrated into the GIS on the premise that they, in the mode very similar to waterways, connect the members within a society and societies to each other. The connectivity purpose presupposes ensured access to the resources within a GIS. Taking into account the fact that remote sensing data are extensively used today as a building block of information and knowledge the research concludes with the necessity to make the case for introducing the principle of sharing into the legal mechanisms of handling remote sensing data.

Chapter 1: The context

Proper and effective application of the law requires understanding of the object that it regulates and its characteristics. The first section of this chapter sketches the most important aspects of the nature of remote sensing data that influence the appropriateness of application for instance such legal protection regimes as, among others, copyright, other forms of intellectual property protection and framework of access to and use of public sector information. Other chapters and sections of this research will refer to this introduction to remote sensing data and expand it with information and analysis relevant to individual arguments and discussions. Some of the most important features of remote sensing data include their factuality, automated process of generation, necessity of data analysis to produce information suitable for or complimentary to specific applications, as well as usefulness for society at large. These and other characteristics of remote sensing data are discussed below.

The analysis of the relevant legal regimes undertaken within this research had to be narrowed down in two instances. Firstly, the issues regarding classified data and their release into circulation fall outside the scope of the analysis that is based on the presumption that the data are already made available for civil and commercial use. Secondly, taking into account the number of countries that have launched remote sensing satellites, it is impossible to provide a thorough discussion of the relevant legal norms and regimes adopted and functioning in all the jurisdictions. For reasons outlined in section two of this chapter the research only focuses on the legislation of the United States of America (US) and of the European Union (EU), including examples of national approaches within the Member States (France, Germany and the United Kingdom, UK), in particular when there is no harmonisation regarding a specific issue on the EU level.

Both parts of the chapter seek to provide the context of the research and are equally relevant to the discussion regarding current protection mechanisms of remote sensing data, and the philosophical theories of the common good and common property

developed later on within the thesis. The argument in favour of broader access to remote sensing data would not have been possible to make without referring to the data themselves, their legal treatment and the assessment of the interrelation of the two.

1. Nature and characteristics of remote sensing data

Remote sensing data are the primary focus of this research. Although they are part of data and information in general, they possess some specific features that make the proposition to recognise the right of access to them more acute. Moreover, focusing on one particular type of data – remote sensing data – enables one to elaborate and present a clearer argument as to why a regime that is based on the principle of sharing and that recognises the right of access is the most appropriate regime for treating factual information.

The specific features of remote sensing data include, above all, methods of their generation, production of information and knowledge from them, and the societal benefits from their use. Discussion of technical characteristics of remote sensing data and of the range of their possible applications is indispensable for a deeper analysis of how they fit into the concept of the public good, and why there is a public interest to access them, even if they are initially privately owned, that can be ensured through the application of the principle of sharing to the regulatory framework of their use and distribution.

Remote sensing data are generated by special satellites and represent data pertaining to the surface of the Earth and its depths, oceans and other natural and man-made objects. Remote sensing satellites use two types of sensors to generate the data: active and passive.[22] Passive sensors operate like a photographic camera – they sense what is

[22] Many thanks to Dr. Bob Ryerson for explaining some critical technical aspects of remote sensing activities.

below – be it the reflected light that yields apparent colours or heat that is emitted from the features being sensed. Active sensors carry their own source of illumination – for example a radar sensor sends out a pulse and measures what is reflected back to it from the earth. Active sensors can thus be used in the dark and can penetrate all but the densest clouds.

Normally, the process of data generation is initiated when there is some demand for data about a certain area or phenomenon. The satellite operator sends a command to the satellite, which transmits the coordinates of the place to be sensed. When this geographic area is in the range of the satellite's vision, remote sensing is done and primary data are acquired.[23] Upon completion of this task the satellite sends the acquired data, usually as a binary code, to a ground station, where the initial processing takes place. It is only after this that remote sensing data may be made available to the customers, archived, or further processed. This "staged" method of generating remote sensing data means that there are at least three types of remote sensing data – primary, processed and analysed, as recognised by the UN Remote Sensing Principles.[24] Primary data refer to the data "acquired by remote sensors borne by a space object and that are transmitted or delivered to the ground from space by telemetry". Processed data are "the products resulting from the processing of the primary data, needed to make such data usable". Analysed information is the result of the "interpretation of processed data, inputs of data and knowledge from other sources". These definitions are the basis for the analysis of the applicability of copyright protection to this type of assets. However, the research also highlights in section 2 of chapter 2 that there are differences in national interpretation of these concepts or definitions. These choices and practices may lead to differing outcomes in applying copyright protection to remote sensing primary and processed data, and information.

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[23] The terminology is used in accordance to that adopted in the Remote Sensing Principles, *supra* note 12. In the industry the term "raw data" is used frequently, but it usually means the same as "primary data".

[24] *Ibid*.

Unfortunately, the UN Principles are not a binding source of international law. Moreover, other (although similar) definitions of remote sensing data and information exist both in international and national regulatory frameworks and documents.[25] Nevertheless this categorisation effort undertaken when drafting the Remote Sensing Principles is significant, in particular for this research and governs the assessment of qualities and features of each of the types of data for the purpose of determining what legal regime can best reflect and accommodate them. The differentiation among the three types of data also poses an important question to answer in the first place: should data as such (primary data), information products (processed or analysed data) and knowledge be treated in the same way and render the literal difference between them insignificant? A question that leads to another, even more pertinent today: how can knowledge and information really be protected?[26]

Primary remote sensing data are objects that cannot fall under copyright protection: both the methods of their generation and the factual nature of their content substantiate this claim. Firstly, primary remote sensing data are generated automatically, by using special computer programmes, which send signals to the satellites and order them to sense certain regions of the Earth in a particular mode.[27] They are not "created" by human beings. Secondly, nowadays most of the remote sensing satellite signals are sent to the Earth as a binary code, which means that the ground stations do not receive "images" of the Earth, but rather encrypted messages that have to be decoded to become understandable for human mind. Thirdly and very

[25] E.g. definitions provided in the Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters, April 25, 2000. Online: <http://www.disasterscharter.org/charter>; in the Global Monitoring for Environment and Security (GMES) Initiative documents (that mention data, information and knowledge, *see* "Final Report for the GMES Initial Period (2001-2003)" European Space Agency (10.02.2004). Online: <http://ec.europa.eu/enterprise/newsroom/cf/document.cfm?action=display&doc_id=2379&userservice_id=1> (last accessed 01.02.2011); *see* also Canadian *Remote Sensing Space Systems Act* S.C. 2005, c. 45, sec.2.

[26] Answer to this question is attempted to be formulated in this research, but remains an important issue in the entire chain of generation of data, their processing and the production of useful information and knowledge using them.

[27] Although of course human beings are involved in operating the satellites.

importantly, content-wise remote sensing data are factual information (the look of the Earth's surface, the depth of oceans, the contents of the Earth's depths, etc.). They merely are a description of what satellites "see" on the surface of the earth or underneath it. It is impossible for a satellite to "create" something that does not already exist in reality, although it may provide a unique view of a certain spot on the surface of the Earth.

There is, therefore, no human "creative spark" involved in the generation of primary and processed remote sensing data because they are acquired by virtue of application of computer programmes (although operated by specialists). Furthermore, data and factual information, together with ideas, certain processes and methods of operation, are expressly excluded from the scope of copyright in virtually all international copyright protection instruments and national statutes.[28] The lack of creativity is also coupled with the importance of remote sensing data for decision-making processes in different spheres[29] as well as their other various applications – an issue that is addressed throughout this research and that is seen as one of the factors contributing to the recognition of the need to base the regime of treatment of remote sensing data on the principle of sharing.

In sum, the highlighted characteristics of primary remote sensing data not only lead to the denial of copyright protection, but reinforce the applicability of the principle of the common good and of sharing to their distribution and use – notwithstanding the basis on which they are owned, as this research aims to show. Granting copyright protection to primary remote sensing data is hard to reconcile with the constitutive principle of the legal regime that prohibits the protection of facts. Another finding that indirectly supports the claim in favour of non-copyrightability of primary remote sensing data and

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[28] *See* e.g. Art. 2 Berne Convention, *supra* note 17; Arts. 2, 5 WIPO Copyright Treaty, *supra* note17.

[29] *See e.g.* EC, *the European Parliament and of the Council Directive 2007/2/EC of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) OJ L* 108/1-14 (25.04.2007), which stipulates that "spatial information, is needed for the formulation and implementation" of different Community policies [INSPIRE Directive].

reinforces the need to adhere to the principle of sharing for their distribution and use, is the necessity to process them to make them usable.[30]

The next question is whether and how the initially processed data are different, in particular for the purpose of determining the appropriate legal regime governing their use, from the primary data acquired by a satellite. As was mentioned earlier, initial processing is required to make any type of primary remote sensing data usable. Such processing involves remote sensing data corrections, as well as their classification and interpretation. To make corrections some *in situ* data[31] must be manually inputted into the computer algorithm. For example, exact geographic coordinates that are already available are essential for the correction of the received primary remote sensing data to match the exact geographic location of the sensed territory, and they are used as a model on which remote sensing data are layered. Often for practical and economic reasons, remote sensing data classification and interpretation involves use of computer algorithms.[32]

In addition to the above characteristics, initial processing has little value in itself, but is auxiliary for subsequent data processing and analysis that will provide end-users with purpose-tailored geographic information products. Therefore, it can be said that initially-processed remote sensing data do not differ substantially from the primary data and their treatment, distribution and use should be subject to the same legal regime. Quite to the contrary, highly-processed remote sensing data, or better to say information and knowledge derived from them may be subject to copyright protection due to the fulfilment of the criterion of creativity.

A sufficient (but largely unspecified) degree of processing transforms remote sensing data into analysed information. Processing at this stage is made by virtue of

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30 Remote Sensing Principles, *supra* note 12.

31 Collected by terrestrial or aerial sensors.

32 Raber, G., Tullis, J. & Jensen, J. "Remote Sensing Data Acquisition and Initial Processing" (2005) XIV *Earth Observation Magazine* at 5. Online: <http://www.eomonline.com/EOM_Jul05/article.php?Article=department3> (last accessed 01.02.2011).

"interpretation of processed data, inputs of data and knowledge from other sources,"[33] which usually requires a specialist with expertise in the field of analysis that depends on the application for which information product is used. As a result, analysis requires the use of knowledge from other fields of expertise than processing itself, and the methods or techniques involved depend very much on the anticipated results, as the same primary and processed remote sensing data can often be used to produce information, often in the form of images or interactive maps, serving different purposes. Taking into account that the threshold of creativity stipulated by the copyright protection regime is quite low, involvement of specialists as well as process of combining together different types of data for the purposes of data analysis may be seen as sufficient manifestations of creativity and trigger copyright protection of analysed remote sensing data and information.

There is one issue that may disrupt the coherence of the applicability of copyright protection to a particular set of analysed data or geographic information products. As remote sensing data can be utilised for multiple applications and purposes, it is hard to determine what degree of processing transforms mere data into useful and usable information: the same dataset may constitute useful information for a scientist to contribute to the understanding of a certain natural phenomenon, but be far from a ready-to-use product for a government official to make a decision regarding the same subject-matter. Copyright may or may not protect any particular set of analysed data or information, but what remains clear is that primary and initially processed remote sensing data in no way represent information, but rather building blocks for its production, and therefore should not be treated as the same equal subject-matter by relevant regulations. Remote Sensing Principles set the example of differentiating among at least three types of remote sensing data and represent a compromise that nations within the UN Committee on the Peaceful Uses of Outer Space (COPUOS) managed to achieve by virtue of consensus. This work should not be ignored, but adhered to by states across the globe for the purpose of consistency and harmonisation

[33] Principle I(d) Remote Sensing Principles, *supra* note 12.

of approaches to treating remote sensing data. Use of satellites to generate this type of factual data and of computer programmes to process and interpret them precludes application of copyright protection to primary and processed remote sensing data. To do otherwise goes against the foundational principles of intellectual property protection and is therefore unjustified.

Another extremely important feature of remote sensing data that should be taken into account, when a decision is made as to the legal regime governing their use and distribution, is the range of their possible uses and applications. Their diversity and particularly relevance to societal and humanitarian matters and activities[34] complements the requirement to balance out the interests of the data users with those of data generators by virtue of application of the principle of sharing to the distribution and use of data within any such regime. It is worth mentioning that for certain uses or applications remote sensing satellites represent a unique source of information that cannot be substituted by information gathered by any other means.

The fact that remote sensing data are the sole-source of information is nowadays particularly true for environmental and climate change research that is aimed at understanding the Earth's environment and maintaining its health, which is "probably the greatest "public good game" played by humans."[35] In this field remote sensing data have the following important advantages in comparison to *in situ*[36] data regarding climate change and patterns: coverage, continuity and quality. Only satellites can capture an exhaustive view of vast areas that is not limited by political or administrative restrictions. Data for the same area can be acquired at a high rate of repetition without

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[34] For an overview of some of the uses *see* e.g. Doldirina, C. "Case for Space" Report (European Space Policy Institute, 2008). Online: <http://www.espi.or.at/images/stories/dokumente/studies/report_case_for_space.pdf> (last accessed 01.02.2011) [Doldirina, C. "Case for Space"].

[35] Milinski, M. *et al*. "Stabilizing the Earth's Climate is not a Losing Game: Supporting Evidence from Public Goods Experiments" (2006) 103:11 *Proceedings of the National Academy of Sciences of the United States of America* at 3994.

[36] Terrestrial, aerial.

weather-related restraints,[37] which means that comparison of the data acquired at different time of the day or even year will reveal changes that might have occurred in the observed area. In addition, remote sensing data can be recorded in various wavelengths – visible and non-visible – and thereby provide the opportunity to assess the same natural phenomena using different parameters and make the research conducted more accurate. This example alone is significant for the realisation of the general societal need to have secured access to remote sensing data in order to conduct such research and contribute to the achievement of the common good. And this example is by far not the only one.

Other applications include use of remote sensing data for the purposes of disaster relief and damage mitigation, where information regarding damage caused by a disaster derived from remote sensing data delivered using satellite telecommunication systems is sometimes the sole reliable source for those involved in rescue operations. Remote sensing data and information are also beneficial for different spheres of health care,[38] in the use of sustainable energy resources,[39] as well as part of geographic information systems (GIS)[40] for the purposes of decision-making at all government levels, cadastre maintenance, geographic engineering, sustainable agriculture, and even business or commercial purposes such as marketing.

The mixture of technical and applicational features of remote sensing data highlighted in this section forms the main factual support for the argument in favour of a broader access to this resource, as their use benefits society in general and thereby serves the achievement of the common good, which is an important justification factor to be taken into account by any regulation that a society decides to adopt to govern their utilisation. Unfortunately, the value that remote sensing data may have gained through their use and applications is not always seen as an incentive to open up access to them even

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37 When the active radar sensors are used.

38 For example, remote sensing satellite capabilities have been proven effective for mapping vectors of the spreading of infectious diseases.

39 One of the common uses in this sphere is to determine in which spots to place windmills.

40 These will be discussed separately in a Chapter 5.

more, but on the contrary leads to their commodification and to the commercialisation of the channels of their distribution. The latter option nevertheless remains a choice that a given society is entitled to make. The two jurisdictions, the rules of which regarding generation, use and distribution of remote sensing data and information are assessed in this research illustrate the different outcomes that the decision in favour or against sharing remote sensing data leads to.

2. The reasons to compare relevant regulations in the US and Europe

The discussion of the nature of remote sensing data and information and its implications with regard to the choice of the appropriate legal regimes, as well as the difficulties related to it, is not a mere theoretical exercise. Different understanding of what remote sensing data and information are, of whether the distinction between their different types is important and of how to address their value results in different decisions as to their legal treatment. Approaches to the legal regime with regard to remote sensing data that are quite distinct from each other are adopted in the two jurisdictions – the US and Europe.[41] This is one of the reasons why the two are chosen – to substantiate the argument of this research in favour of making the principle of sharing the basis of the legal framework governing distribution and use of remote sensing data and information. Apart from the main reason that these two jurisdictions adopted differing legal norms regarding the access to and use of remote sensing data that enables their comparative analysis, some important factual circumstance are taken into account.

The factual reason is the place of the US and Europe in the field of space activities in general and satellite remote sensing activities in particular. The US, as a nation, and Europe, as a union of states, belong to the major space players on the international arena. The US Land Remote-Sensing Satellite System (Landsat) programme, launched as

[41] Europe, within this thesis includes the European Space Agency (ESA) as the organisation conducting space activities in general and remote sensing activities in particular, and the European Union (EU) as the primary legislator, and is referred to accordingly.

early as in 1972, is the first civilian remote sensing satellite observation programme that greatly contributed to the realisation of importance and usefulness of remote sensing data and their effective use for the society and its development.[42] Apart from that, the US has other remote sensing satellites, including Geostationary Operational Environmental Satellites (GOES) and Polar Operational Environmental Satellites (POES).[43] Moreover, the US National Oceanic and Atmospheric Administration (NOAA) has licensed two of the most successful truly commercial[44] operators of remote sensing satellites[45] – DigitalGlobe,[46] GeoEye[47] that compete and cooperate with their European counterpart RapidEye.[48] Europe also has its own remote sensing satellites, including the world's largest remote sensing satellite – ENVIronment SATellite (Envisat), as well as Gravity field and steady-state Ocean Circulation Explorer (GOCE) and the European Remote Sensing Satellites (ERS 1 and 2)[49] that provide a lot of data valuable not only within the boundaries of its member states. In addition to these primarily research remote sensing satellites, there is a number of satellites launched in individual member states of the European Space Agency (ESA), data from which are primarily aimed at commercial distribution. Such projects include, for instance the German TerraSAR-X[50]

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[42] Detailed information about the Landsat programme can be found on its official website. Online: <http://landsat.gsfc.nasa.gov/> (last accessed 01.10.2010).

[43] Information online: <http://goespoes.gsfc.nasa.gov/goes/> (last accessed 01.02.2011).

[44] In the sense of the nature of the initial investment to set up the system or launch a satellite: it has to be private. It has to be pointed out though, that the primary purchasers of the remote sensing data and information generated by these companies are governments, the US government in particular. This poses a question as to whether the status of remote sensing data, taking into account the range of customers, is affected.

[45] There are other licensees: <http://www.licensing.noaa.gov/licensees.html> (last accessed 01.10.2010).

[46] Homepage: <www.digitalglobe.com> (last accessed 01.10.2010).

[47] Homepage: <www.geoeye.com> (last accessed 01.10.2010).

[48] Information online: <http://www.rapideye.de/home/about-us/history/index.html> (last accessed 01.02.2011).

[49] Information about each satellite is accessible via ESA Earthnet portal. Online: <http://earth.esa.int> (last accessed 01.02.2011).

[50] Which is the result of a public-private partnership of the German space agency (DLR) and the company Astrium (a subsidiary of the EADS consortium). Homepage: <http://www.astrium.eads.net/> (last accessed 01.02.2011).

and, as well as the French Systeme Pour Observation de la Terre (SPOT) series,[51] both being public-private partnerships.

In this factual context the second – legal – reasoning becomes equally and even more important, as it helps to compare effectiveness of the approaches that are adopted, adhered to and enforced in these two different jurisdictions to protect remote sensing data and to regulate access to them and their subsequent use. The European choice is based on the principle of copyright protection of remote sensing data regardless of the source of their generation and the degree of their processing. The choice is declared to serve commercialisation of remote sensing activities by virtue of protectionist treatment of the generators of remote sensing data who, for instance, were granted an extra layer of protection by virtue of adopting the *sui generis* database protection within the EU. The approach adopted by the US is quite the opposite in that it is founded on the principle of free and unrestricted access to state records and information, which includes remote sensing data generated from or with the help of state resources.[52]

The European regime of tight protection that brings forward highly proprietary attitude towards remote sensing data as to a commercially valuable asset leads to its commodification. Moreover, the adopted regulatory and licensing practices narrow down the ways remote sensing data and information can be used. All this slows down development of the value-adding activities, through which most of remote sensing data and information are made useful and the distribution of information truly commercialised.[53] The US regime of open access, to at least primary and processed remote sensing data brings forward the notion that users' rights are as important, as the

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[51] Homepage: <http://www.spot.com> (last accessed 01.02.2011).

[52] This path is followed in countries like Brazil, where all remote sensing data, processed maps and image processing and GIS software, received by the *Instituto Nacional de Pesquisas Espaciais* (INPE) are made available via internet for free. *See* Ferreira, H. S. & Camara, G. "Current Status and Recent Developments in Brazilian Remote Sensing Law" (Paper presented at the 2nd International Conference on the Status of Remote Sensing Law, Oxford, MS, January 17-18, 2008).

[53] See e.g. findings in Keith, A. "Earth Observation Remote Sensing Trends" (Euroconsult presentation to the NOAA Advisory Committee on Commercial Remote Sensing, October 7, 2008), slide 20. Online: <http://www.nedi.gov/files/Euroconsult_Presentation_on_industry_trends.pdf> (last accessed 01.02.2011).

rights of the generators and owners of remote sensing data – the choice that in fact reflects their nature of potential objects of copyright or other intellectual property rights protection. Remote sensing data, alongside other types of information, are an intangible good and cannot be concealed unless kept absolutely secret. Once they are communicated no one can prevent their users from utilising the ideas they contain and making them part of their own works. Successful development of the market for remote sensing data is necessarily based on delivering information products useful to various customers. Therefore, the open access policies and regulations enable the development of the market of commercial applications more effectively than the proprietary regime.

Already preliminary research on the matter has shown that the range of differences is wide, and only the milestones are briefly mentioned here.[54] The US domestic information policy at the federal level[55] is based on the principle of freedom to access and re-use information. Its federal agencies are expressly forbidden from attaching any copyright to the materials they produce, can only impose the fees that are required to fulfil a user's request[56] and cannot impose restrictions on re-use of the information they release.[57] As a consequence, in accordance with the US Land Remote Sensing Policy Act remote sensing data from the Landsat system[58] are available to users at the same conditions as public sector information in general. Primary or pre-processed data from Landsat 4-6 satellites are available to US government agencies, global environmental

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[54] They are explored in far greater detailed throughout this research, in particular within the chapters devoted to copyright protection and regulations regarding public sector information.

[55] Analysis of state and federal legislation shows that the approach to information dissemination is inconsistent and as varied as the issues involved. *See e.g*. Dansby, H.B. "A Survey and Analysis of State GIS Legislation: (1992) 1:1 *GIS Law* at 7.

[56] Usually is referred to as "Cost Of Fulfilling User Request" (COFUR) and limits financial recovery to the reproduction and delivery costs. *See* Weiss, P.N. & Backlund, P. "International Information Policy in Conflict: 'Open and Unrestricted Access' versus 'Government Commercialization" in Kahin, B. & Nesson, C. eds. *Borders in Cyberspace* (Cambridge: MIT Press, 1997) [Weiss, P.N. & Backlund, P. "International Information Policy in Conflict"].

[57] Weiss, P.N. & Backlund, P. "International Information Policy in Conflict", *ibid*.

[58] US, *Land Remote Sensing Policy Act* Pub. L. of 1992 H.R.6133. [Land Remote Sensing Policy Act]. According to Sec. 3 "Landsat system" means Landsats 1, 2, 3, 4, 5, and 6, and any follow-on land remote sensing system operated and owned by the United States Government, along with any related ground equipment, systems, and facilities owned by the United States Government."

change researchers, and other researchers financially supported by the US government;[59] data from Landsat 7 are available to all users.[60]

Europe promotes an almost polar position, in that it does not forbid governmental entities/agencies from enforcing copyright on the data and information they generate,[61] as well as from charging the users the fees calculated on the basis of a cost-benefit approach that most of them in fact adopt.[62] In addition, the European legislator, being a unique but nevertheless an international organisation with jurisdiction limited or prescribed by its foundational treaty, up until 2010 could not lay down unified criteria for granting copyright protection: the (substantial) existence of the rights was the domestic matter of the Member States.[63] Therefore, there are still differences among the Member States that so far preclude the existence of the concept of the European copyright – a situation that may change in the future, as the EU has recently received the mandate to regulate the issues related to intellectual property protection.[64] For instance, the UK is in favour of a stronger copyright protection[65] with a lower set of requirements for objects to qualify for it, whereas France[66] tries to balance the need to protect government works and to access public sector information.[67] With its regulation

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59 *Ibid*., Sec. 103.

60 *Ibid*., Sec. 105.

61 A vivid example is the UK Ordnance Survey – a governmental entity producing geographic information – that administers the Crown copyright with regard to the products it makes. *See* information about Ordnance Survey copyright over data online: <http://www.ordnancesurvey.co.uk/oswebsite/aboutus/yourinforights/copyright/ip.html> (last accessed 01.02.2011).

62 Blakemore, M. & Craglia, M. "Access to Public-Sector Information in Europe: Policy, Rights, and Obligations" (2006) 22 *The Info. Soc.* at 13–24. *See* also *Wetterdatenbanken* OLG Koeln (Higher regional court of Cologne) [2006], where a German court rejected the reasoning that the government agencies should be precluded from marketing databases that they produce.

63 As a part of the entire property regime, Art. 295 *Treaty on the European Union and on the European Community*, Consolidated version *OJ C* 321 E/1 29.12.2006.

64 As per Article 118 *Consolidated Version of the Treaty on the Functioning of the European Union*, March 30, 2010,*OJ C* 83/47. [EU Treaty].

65 Through e.g. Crown copyright. *See* Sections 163-167 UK Copyright, Designs and Patents Act 1988 (c.48). [UK Copyright Act].

66 The right of authorship may be granted to a natural person only, Article L111-1 French Intellectual Property Code. Law No. 92-597 of July 1, 1992 as amended [French IP Code].

67 *See* e.g. Loi n°78-753 du 17 juillet 1978 portant diverses mesures d'amélioration des relations entre l'administration et le public et diverses dispositions d'ordre administratif, social et fiscal. On various measures for improved relations between the Civil Service and the public and on various arrangements of

regarding access to public sector information, Europe is close to adopting standards similar to the US regime,[68] but the progress is still ongoing and its results are yet to be seen.

Another issue that underlies one of the major differences between the two regulatory systems adopted in the US and Europe concerns additional or complimentary layers of protection that can be applied to remote sensing data. Both of the jurisdictions have adopted a set, of for example, competition law rules or rules applicable to licensing geographic and other types of information products.[69] The rules may differ, although the regulations are in place and have a similar pattern of functioning. There are some significant differences in adopting new types of intellectual property protection that may be applied to remote sensing data in particular and to geographic information in general.

The authority to protect remote sensing data by virtue of copyright, reinforced by contractual schemes governing access to them and their use, together with the modern technological means of information protection,[70] often gives remote sensing data owners power they would not have been granted with under traditional scope of intellectual property protection.[71] In Europe, the scope of access to and use of remote sensing data is further narrowed down by the Directive on the legal protection of

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administrative, social and fiscal nature). *See* also Onsrud, H.J. & Lopez, X. "Intellectual Property Rights in Disseminating Digital Geographic Data, Products, and Services: Conflicts and Commonalities among European Union and United States Approaches" in Masser, I. & Salge, F. eds*. European Geographic Information Infrastructures: Opportunities and Pitfalls* (London: Taylor and Francis, 1998) 153-167 [Onsrud, H.J. & Lopez, X. "Intellectual Property Rights"].

[68] Onsrud, H.J. "Geographic Information Legal Issues" in *Encyclopedia of Life Support Systems*. Developed under the auspices of the UNESCO (EOLSS Publishers: Oxford, 2004) [Onsrud, H.J. "Geographic Information Legal Issues"]. Although INSPIRE Directiove was due to have been implemented in the EU Member States in May 2009, not all of them have succeded till now. Germany, for instance is facing proceedings in front of the European Court of Justice (ECJ). *See* "Environment: Commission brings four Member States to Court for failing to implement EU laws" IP/10/830 (Brussels, June 24, 2010). Online: <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/830&type=HTML> (last accessed 01.02.2011).

[69] As discussed in Chapter 2.

[70] *E.g.* technological protection measures and rights management information under Arts. 11, 12 WIPO Copyright Treaty, *supra* note 17.

[71] For details *see* Chpater 2.

databases[72] that gives database makers the right to stop any extraction or re-utilisation of parts of protected databases, unless the conditions to the contrary of the Database Directive are fulfilled.[73] These statutory provisions regarding further use and distribution of licensed data and information facilitate locking them up, which may be detrimental to the interests of different groups of users, and ultimately to the generators of the data and producers of information as well. The US does not have a separate *sui generis* database protection regime that may cover both hard copy and digital collections of remote sensing data.[74]

In the globalising world, where many transactions, including the exchange of remote sensing data from different systems, are trans-national, the existence of data distribution regimes that are based on opposing principles represents an impediment to open data exchange and re-use. One practical example supports the argument that open access to government meteorological data[75] facilitates the development of the market for meteorological services. The value-adding meteorological information industry in the US generates revenues of US $500 million annually, whereas the private-sector meteorological information industry in the EU is very small.[76] Apart from this, the researchers, students, and various other public users in Europe face a lot of difficulties in obtaining expensive meteorological data. One of the major reasons for such situation is the European decision to treat remote sensing data as a valuable commodity and protect the interests of their generators to the greatest extent possible, which results in neglecting the interests of the user community and their deprivation from or limitation in access to data.

Within the framework and for the purposes of this research these regulatory differences are assessed with the special emphasis on the global character of market for remote

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72 Database Directive, *supra* note 13.

73 *Ibid*., Article 7.

74 The databases can be subject to copyright in both jurisdictions.

75 Meteorological data are produced using remote sensing data generated by special remote sensing weather satellites.

76 Arzberger P*. et al*. "Promoting Access to Public Research Data for Scientific, Economic, and Social Development" (2004) 3 *Data Science Journal* at 139.

sensing data and analysed information products. This market cannot properly function within the borders of a nation-state or even a single geographic region, as very often, the production of useful information using remote sensing data involves analysis of data sets from different sensors and satellites. The whole range of satellites and sensors is not available in its entirety to any state or region on their own. For this reason, it is important to analyse the implications of the existence of different regimes[77] on the accessibility of remote sensing data and the development of the secondary market of geographic information products.

The facts that this research highlights support the effectiveness of the US approach of open access to state generated remote sensing data with regard to availability of data for both commercial and not-for-profit purposes and uses. The advantages of the US weather data and forecast industry growth, emergence and successful activities of private remote sensing operators, as well as maintenance of the national archive of remote sensing data available for the US citizens with no regard as to the purpose of their use illustrate this.[78] The main argument of securing better and broader access to remote sensing data builds upon the US regulatory example, the legitimacy and appropriateness of which is supported by the analysis of the theories of the common good and common property and their application to remote sensing data. It serves to provide arguments in favour of making the regime based on extended/extensive access to remote sensing data a universal standard. The European choice often is brought forward as strategy that might be effective in the short-term but will unlikely produce any benefits in the long run. Based on the conducted research and analysis it is argued here that an approach that is harmonised across jurisdictions, at least as to the fundamental principles of the relevant regulations, is needed because of the global

[77] There are of course other regimes governing generation, distribution and use of remote sensing data, apart from those adopted in the US and Europe, but they are deliberately left outside the scope of this research, apart from occasional mentioning for the sake of highlighting e.g. international trends regarding the conduct of remote sensing activities.

[78] Commercial or non-commercial. With regard to the impact of legal regulations on the development of the commercial market of remote sensing data and information products *see* the overview and the analysis in Doldirina, C. "A Rightly Balanced Intellectual Property Rights Regime as a Mechanism to Enhance Commercial Earth Observation Activities" (2010) 67 *Acta Astronautica* 639–647.

character of both generation of data and their subsequent use. The unifying principle according to the findings of the research should not be the increased and tightened intellectual protection of remote sensing data, but the principle of sharing based on the theories of the common good and common property and their influence on modes of exercising private property rights in data.

Chapter 2: Intellectual property protection and remote sensing activities

There are several fields of law that shape the regime of access to, distribution and use of remote sensing data, including intellectual property law, law regarding freedom of public sector information and access to it, as well as norms regulating privacy and security issues.[79] The last one is not part of the current analysis due to the restricted focus of the thesis, but the norms of both intellectual property law and freedom of information are addressed in this and the next chapter.

The aim of chapters 2 and 3 is to discuss the current regimes that govern or are to a certain degree relevant for establishing conditions of access to and use of remote sensing data in order to assess the legitimacy of their application to these issues, as well effectiveness of such application. The basic premise of the analysis is that the current copyright law regime is not satisfactory for the purpose of protecting remote sensing data, both primary and processed, as its application poses a great risk of locking them up in the hands of their generators thereby preventing their extensive use for a wider range of purposes that increase their value. The analysis of the regime of access to public sector information in chapter 3 serves the purpose of illustrating a viable alternative to the property-like protection regime based on copyright regulations. Moreover, if the arguments based on the theories of common property and the common good brought up in chapter 4 are applied, the founding principles of the framework of access to public sector information may become relevant for access to and use of privately generated remote sensing data as well. The two regimes are separated into different chapters as the nature of the regulations varies in each case: it is civil law for the copyright protection regime, and public law for the regime governing access to public sector information. In some instances they do intersect, but

[79] Onsrud, H.J. "Geographic Information Legal Issues", *supra* note 68.

nevertheless the approaches to the regulation and its modes are different in each sphere.

The drawbacks and lacunae in the regulation of access to and use of remote sensing data that are pointed out throughout the following two chapters can be resolved through declaring remote sensing data as a common good, the theoretical framework for which is introduced in the chapter on the theories of common property and of the common good. Taking this into account, the analysis of the current legislation is not meant to be very extensive and by no means exhaustive, but rather concentrates on the major trends in the area and highlights the most problematic issues, for which in the following chapters a solution is introduced and developed.

1. Problems of application of copyright to remote sensing data

Copyright is the most "liberal" of the types of intellectual property rights, as it has basically just one criterion fulfilment of which will amount to the protection of the work – that of creativity (originality). The second, often non-compulsory criterion is that of fixation of the work in a certain medium. The lists of examples of protected works that a lot of copyright protection legal instruments contain[80] are long and encompassing, but never closed, as it is hard to imagine what creations worthy of protection may appear in the future. Copyright protection may be proper for geographic information in general and remote sensing data in particular for several reasons. Firstly, all geographic information products contain information and therefore are a category of immaterial goods that copyright traditionally protects. Secondly, a lot of geographic information products are ideational creations that fulfil the criterion of creativity and thereby fall under copyright protection. Thirdly, even in cases where there is a doubt with regard to the fulfilment of the criteria for protection, the flexibility of both the criteria of creativity

[80] The Berne Convention, *supra* note 17; the US *Copyright Act* of 1976 as amended Title 17 U.S.C. Title 17 U.S.C. [US Copyright Act]; German *Copyright Law* (Urheberrechtsgesetz) September 9, 1965. *BGBl. I S*. 1273 as amended [German Copyright Law]; UK Copyright Act, *supra* note 65, and French IP Code, *supra* note 66, serve as good illustrations.

and fixation may be interpreted in such a way as to grant protection to the owner of a particular information product.[81] Whether all types of geographic information can be protected by virtue of copyright and whether the protection offered by this regime satisfies the needs of producers of such information, as well as of its users, remains to be explored in the course of this chapter.

Copyright is an exclusive right to reproduce, disseminate and represent a work that is an author's personal creation. Along with these economic rights, it also has a moral aspect – the right to be recognised as the author of the work. Copyright protects culture and creativity, not innovation. Copyright concerns intellectual work which does not necessarily have a utilitarian function: this being one of the major features that make objects protected by it different from the industrial property like patents and trademarks. Copyright protects the subjective "originality" of literary and artistic works, while industrial property rights protect the objective "inventiveness" and "novelty". Literary and artistic works are regarded as not substitutable, hence not in direct competition with each other, unlike works and products covered by industrial property rights. Traditionally, according to both norms of international treaties and national law, only the form or expression of a work is protected by copyright, but not the ideas that underline it.

In sum, the key characteristics of objects that fall under the copyright protection are as follows. Firstly, they are works of authorship, in which author's ideas find an original (creative) expression. Secondly, there are no formalities for triggering the protection of works eligible to it. Thirdly, the structure of protection granted consists of exclusive economic rights enforceable for a limited time, with exemptions or limitations to them, and of moral rights. Below, the criteria for protection are discussed in greater detail, in order to then assess their applicability to primary and processed remote sensing data, as well as analysed information. The scope of the rights granted and the exceptions to them are addressed together with the issue of contractual practice in the field of

[81] Which is harder to do with e.g. interpreting much more objective criteria for patent protection.

licensing geographic information in order to see how these contracts that stipulate the licensed material to be protected by copyright adhere to the limitations to the rights of authors drawn by the legislators.

a. Object of and criteria for protection

Both the US and all the EU Member States being parties to the Berne Convention, adhere to copyright protection in "literary and artistic works."[82] It embodies the "creator doctrine" [83] by which a work, to be eligible for protection, should be an intellectual creation.[84] The only other criterion for protection is that the work should be fixed in some kind of material form.[85] The Berne Convention contains only a list of examples of objects that can be considered a literary and artistic work, but the WIPO Copyright Treaty of 1996,[86] alongside such an enumeration, explicitly states that ideas, processes, methods of operation, including data, are excluded from the ambit of copyright protection.[87]

Despite being the members of the Union set up by the Berne Convention, the legal systems of the US and of most of the EU Member States are quite different, especially in that the US is a common law country, whereas the majority of the EU states (apart from the UK and Ireland) belong to the civil law tradition. Apart from other conceptual and normative differences, these two systems have a somewhat different approach towards copyright issues. In the civil law system the threshold of originality or creativity reflects

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[82] Article 2 Berne Convention, *supra* note 17.

[83] Guibault, L. & Hugenholtz, B.P. "Study on the Conditions Applicable to Contracts Relating to Intellectual Property in the European Union" Final Report (Amsterdam: Institute for Information Law, May 2002) at 24. Online: <http://www.ivir.nl/publications/other/final-report2002.pdf> (last accessed 01.02.2011).

[84] Article 2(5) Berne Convention, *supra* note 17.

[85] *Ibid*., Article 2(2).

[86] The US and all the Member States of the European Union are parties to the WIPO Copyright Treaty that was adopted to update the provisions of the Berne Convention and to introduce new norms specifically related to the distribution of literary works in the digital environment.

[87] Articles 2 (in general), 5 (with regard to databases) WIPO Copyright Treaty, *supra* note 17.

the personality of the author, "original"[88] being a personal input of the author in creation of the work.[89] In the common law jurisdictions it is rather the investment of "skill, judgment and labour" or "selection, judgment and experience."[90] Nevertheless, it is necessary to note here, that this distinction is not always followed, and even in the US after the famous Feist case[91] labour is not being favoured as *the* originality criterion for a work – and particularly for a collection of factual material – to meet in order to be granted copyright protection, and creativity in the form of originality is given priority.

The EU does not have unified criteria for copyright protection due to the lack of jurisdiction to legislate in the domain of intellectual property rights.[92] Nevertheless, the creativity standard was upheld in the Directives that dealt with the new works of authorship.[93] For example, the Computer Programmes Directive stipulates that in order to be protected by copyright a computer programme has to be "own intellectual creation of the author."[94] Moreover, most of the Directives refer to the provisions of the Berne Convention and reinforce them or state that the laws of the EU Member States should be consistent with them.[95] The EU Member States follow the same approach: for instance, both Germany and the UK grant copyright protection only to original works that have to be intellectual creations of their authors.[96]

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88 Used in e.g. Section 1(1)(1) UK Copyright Act, *supra* note 65.

89 Not "original" like "novel" in patent law, but rather as something originating from the author, being his own personal creation.

90 "Original" being something that is not copied, but creating with an input of skill and labour. This standard was upheld in Canada and is considered to be slight lower than the US standard of originality as per *Feist Case*. *See CCH Canadian Ltd. v. Law Society of Upper Canada*, 2004 SCC 13.

91 *Feist Publications, Inc. v. Rural Tel. Servs. Co*., 499 U.S. 340 (1991).

92 Even the only horizontal the so-called Information Society Directive (EC, *the European Parliament and of the Council Directive 2001/29/EC of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society* [2001] *OJ L 167* 10-19) left out of its scope of regulations norms regarding the objects of protection, moral rights and the issues of the ownership and transfer of rights.

93 Apart from the Database Directive, *supra* note 13, *see* e.g. EC, *Council Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programs* [1991] *OJ L 122* 42-46 [Computer Programmes Directive].

94 Article 1 (3) Computer Programmes Directive, *ibid*.

95 *E.g.* Information Society Directive, *supra* note 92, with regard to the ability to increase the term of protection as an action that does not interfere with the provisions of the Berne Convention.

96 §2(2) German Copyright Law, *supra* note 80; Section 1(1)(1) UK Copyright Act, *supra* note 65.

According to the US Copyright Act the subject matter of the copyright protection encompasses original works of authorship fixed in any tangible medium of expression.[97] Furthermore, §102 (b) of the Act denies protection to ideas, procedures, processes, systems, methods of operation, concepts, principles, or discoveries. In this, the US Copyright Act reinforces almost verbatim the provisions regarding the subject matter of the copyright protection of both the Berne Convention and the WIPO Copyright Treaty.

Copyright protection can also be granted to databases if they fulfil the same criteria as eligible individual works, meaning that a database has to be an intellectual creation, and be fixed in a material form.[98] According to both international and national legal norms, separate materials, data-sets and works contained in a database do not have to be original works under the Berne Convention,[99] as the eligibility for protection of a database does not depend on whether its content as such is protected by copyright. Therefore, databases that contain factual information are not automatically precluded from copyright protection, and will be subject to it if the selection and arrangement of their content is done in a creative way. At the same time protection granted to the author of a database does not cover any parts of its content,[100] as an interpretation that allows such a stretch would exceed the traditional scope of copyright protection.

b. How do remote sensing data fit in?

The scope of copyright protection with regard to the subject matter it traditionally covers was briefly sketch above. Now, taking into account the subject-matter of the current research, it is not only reasonable, but also obligatory to analyse whether remote sensing data can be qualified as a "literary and artistic work" in the sense of

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97 § 102 (a) US Copyright Act, *supra* note 80.

98 Article 2(5) Berne Convention, *supra* note 17; Article 5 WIPO Copyright Treaty, *supra* note 17; §10 US Copyright Act; §4(1) German Copyright Law, *supra* note 80; Section 3A(2) UK Copyright Act, *supra* note 65.

99 Article 2(5) Berne Convention, *ibid*.

100 *I.e.* they are protected separately, as separate intellectual creations; database protection does not serve content or information protection.

both the Berne Convention and the relevant national or regional regulations on the matter. The examples of how the US and European legislators specifically address the term "remote sensing data"[101] and their protection are addressed first. This analysis is followed by the assessment of whether remote sensing data meet the criteria of copyrightability and takes into account information regarding the nature of remote sensing data provided in chapter 1.

i. Definition of "data" seems to pose problems

According to the US Land Remote Sensing Policy Act, remote sensing as an activity "means the collection of data which *can be processed into imagery* of surface features of the Earth".[102] This formulation suggests that before remote sensing data become images or maps, or integrated parts of GIS, or take any other form of comprehensible information, they have to undergo some degree of processing through which they can acquire copyright or other forms of intellectual property protection. The definition of the primary remote sensing data that the Act gives supports this interpretation: primary remote sensing data consist of "signals or imagery products that are unprocessed or subject only to data preprocessing."[103] In this definition the US law is very close to the Principle I(b) of the Remote Sensing Principles,[104] which though not a binding source of international law in its entirety, may serve at the very least as a guide to agreed uniform terminology in the field of remote sensing activities. Remote sensing data primarily consist of digital information or photographs,[105] although the latter is true mostly for the satellites of older generations equipped with analogue cameras.

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101 Or data in general and geographic data in particular, if there is no separate definition of remote sensing data, like in the case of EU legislation.

102 Sec. 2 Land Remote Sensing Policy Act, *supra* note 58, emphasis added.

103 *Ibid*., Sec. 2 (13).

104 *Supra* note 12.

105 West, J.R. "Copyright Protection for Data Obtained by Remote Sensing: how the Data Enhancement Industry Will Ensure Access for Developing Countries" (1990)11 *Nw. J. Int'l L. & Bus.* at 403, note 28 referring to Oosterlinck, R. "Legal Protection of Remote Sensing Data" *Proceedings of the 27th Colloquium on Law in Outer Space* (1985) at 113. *See* an example of a primary data image online:

The EU legislator has not come up with specific rules governing remote sensing activities. The INSPIRE Directive[106] that uses the term "spatial data" and defines them as "any data with a direct or indirect reference to a specific location or geographical area" is the most relevant document on the EU level today. On the national level, the German Satellite Data Security Law[107] serves as an example of a legislative act that contains a specific definition of remote sensing data. Its §2 lays down that "data" mean signals of satellite sensors and all products derived from them, notwithstanding the level of processing and the mode of their storage or presentation.[108]

It is clear from the US and the European approaches to the definition of data[109] that the European legislators,[110] unlike the US who closely follows the approach of the UN Remote Sensing Principles in this regard,[111] do not make a distinction between primary remote sensing data and processed data or information. Whether such definitional differences have any implications on the application of copyright law to data produced as a result of remote sensing activities these laws regulate is assessed below.

ii. Where has creativity gone?

Before turning to the analysis of the copyrightability of primary remote sensing data it is worth repeating some of their features discussed earlier that are decisive in answering the question regarding the applicability of copyright protection to them. Firstly, primary remote sensing data are generated by an automated process: special sensors built into satellites capture certain information about the Earth and send it to the receiving

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<http://earth.esa.int/applications/data_util/SARDOCS/spaceborne/Radar_Applications/SAR_Product_Series> (last accessed 01.02.2011).

106 *Supra* note 29.

107 *Satellitendatensicherheitsgesetz*, September 23, 2007 *BGBl. I* S. 2590 [German Law on the Security of Satellite Data].

108 Author's own translation.

109 Spatial data, to be more specific, but remember that there is no definition of remote sensing data on the European level.

110 Meaning both the EU and the Member States.

111 As discussed in Chapter 1.

stations on the ground by means of telemetry – a mechanism that enables wireless data transfer. Secondly, remote sensing data are a reflection of the reality: satellites cannot think up anything, but only record the reflection of the signals they send to the Earth surface. Thirdly, without any processing, primary remote sensing data are not comprehensible for the human mind.

As was mentioned earlier, the WIPO Copyright Treaty[112] explicitly excludes data from the scope of the copyright protection. The definitional distinction that both the US Remote Sensing Policy Act and the UN Remote Sensing Principles make between the primary and other types of remote sensing data may be interpreted as an implicit recognition of the obligation not to protect data under copyright rules.[113] Is the omission to do so on the part of the European legislators an indication of disregard for this duty? If not, how should, for instance, the German law provision laying down that concept of "data" includes any data regardless of the level of their processing be interpreted for the purpose of the copyright protection?[114] A possible answer to this is the rule of §3(3) of the German Satellite Data Security Law: it contains a *renvoi* to other laws potentially applicable to remote sensing data and states that their enforcement should not be affected by its provisions. Following this rule, copyright protection for primary remote sensing data should be denied, as §2(2) of the German Copyright Law is applicable in this case[115] and defines a copyrighted work as "author's personal intellectual creation."[116] Therefore, although taking different ways, both jurisdictions have adopted the rules application of which results in denial of copyright protection to primary remote sensing data.

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112 It is referred to here for the same reason as the Berne Convention: both the USA and European Community (in its own capacity) are parties to it.

113 Enshrined as a principle already in the Berne Convention, *supra* note 17.

114 The example of Germany is taken because there is no relevant harmonisation rules on the EU level, and the German legislation regarding remote sensing activities in general and access to remote sensing data and information in particular is one of the most detailed in Europe.

115 *Supra* note 80.

116 Author's own translation.

Analysed information[117] most certainly falls under the copyright protection, as it results from human and computerised analysis of the primary data.[118] The reasons for its eligibility for protection support the argument against copyrightability of primary remote sensing data, as they, due to the methods of their generation, inevitably lack the characteristics of analysed information. Firstly, production of analysed information requires knowledge of a number of different fields (like various sciences, programming, etc.), and its application to the production of information analysis may be interpreted as sufficiently creative activity, results of which should be covered by copyright protection. Secondly, this production is not an automated process, particularly with regard to highly processed data or sophisticated information products: the person in charge has to use the knowledge to produce the desired results.[119] Thirdly, the definition of a copyrightable work[120] includes maps[121] and images and thereby also analysed information generated through human creativity from primary remote sensing data.[122]

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[117] Terminology of the Remote Sensing Principles, *supra* note 12. Most of the national regulations do not use this wording.

[118] For a reference as to what may be covered under processed data and analysed information *see* § 4204(4) *Land Remote Sensing Commercialization Act* of 1984, 15 U.S.C. 4201 et seq. (1984). (15 U.S.C. repealed by Land Remote Sensing Policy Act, *supra* note 58): "conclusions, manipulations, or calculations derived from [unenhanced remote sensing] signals or film products or combination of the signals or film products with other data or information." *Cf*. Remote Sensing Principle I (c)(d) that bring forward the criterion of usability for processed data and the requirement of interpretation of remote sensing data with "inputs of data and knowledge from other sources" to reach the status of analysed information, *supra* note 12.

[119] It must be noted that according to some remote sensing analysts the production of some "highly processed data and sophisticated products" often does not involve human intervention, as it usually occurs while developing the tools that enable processing of data for particular applications (opinion of Dr. Bob Ryerson, president of KIM Geomatics Corporation. On file with the author).

[120] As discussed above: the definitions of the Berne Convention, *supra* note 17, the US Copyright Act, *supra* note 80, and the European approach examples.

[121] *See Stadtplanwerk* BGHZ (German Federal Court of Justice) [1998] *NJW* 1998, S. 3352 stating that the threshold of creativity for maps should not be set too high, even for single-sheet (einzelnes Kartenblatt) maps. The judgement was reconfirmed in another decision of the Court – *Karten-Grundsubstanz* BGHZ (German Federal Court of Justice) [2005] *GRUR* 2005, S. 854.

[122] West, J.R. *supra* note 105, referring to the United States' submission at the UN COPUOS stating that enhanced data being the product of the analyser should be considered his property. *See* UN COPUOS, "Report of the Scientific and Technical Sub-Committee on the Work of its 15th Session" (1978) U.N. Doc. A/AC.105/216 at 8.

Processed data may be seen as a transition phase from "no-protection" by copyright of primary remote sensing data and "yes-protection" of analysed information.[123] It is probably the most difficult category to assess for the purpose of application of copyright protection, because a lot will depend on the extent to which the processing is already done, as well as on whether processed data have value in themselves, which in the long run is closely linked to the particular user of such data. It seems quite clear though that the initial processing, that is mandatory or auxiliary in the sense that it enables further processing and analysis of the data, should be considered as not fulfilling the creativity criterion of copyright protection.

Another important issue is whether databases that contain remote sensing data and information can be protected by copyright. Its significance is logical, since nowadays most of the remote sensing data, being received from the satellites in the digital form, are from that very moment stored in huge electronic databases. In accordance with the principles of copyright protection databases that contain both primary and processed remote sensing data, as well as geographic information will only be eligible for protection if they fulfil the slightly higher copyrightability criterion of "originality-as-creativity". If not, the protection cannot be granted.[124] The latter is actually the case with a lot of spatial data databases, including those arranging remote sensing data: they are being set up following more utilitarian rather than creative principles.[125] Moreover, even if copyright protection covers a certain database that contains remote sensing data, this protection does not cover the data themselves, as it is outside the scope of copyright protection, as was highlighted above.

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123 *See* the relevant discussion in Chapter 1.

124 *Cf*. the opposite view in Salin, P.A. "Proprietary Aspects of Commercial Remote-Sensing Imagery" (1992) 13 *Nw. J. Int'l L. & Bus.* 349, note 45 referring to Faugérolas, L. L'Acces Internacional a des Banques de Donnees (1989) and arguing that as soon as primary remote sensing data is archived the copyright protection should be automatically granted.

125 Some of the key features of a geographic information database are expandability, comprehensibility and shareability. *See* Guo, S. & Guan, Y. "Data Standardisation for the Chiense resources and Environment Remote Sensing Database" *Proceedings of Geoscience and Remote Sensing Symposium* vol. 7 (IEEE International, 2004) 4428-4431.

Some authors, who agree with the inapplicability of copyright protection to primary remote sensing data, consider this as negative and an impediment to the development of the industry, since data-generating companies are forced to engage in value-adding activities in order not to lose control over their own data.[126] In order to improve the position of data generators it is suggested, despite the nature of primary remote sensing data, to nevertheless apply copyright protection to them. Another opinion of why primary remote sensing data should be protected by copyright rests on the belief that the requirement of the creative effort is fulfilled when the relevant computer programmes, that are used to operate and task satellites and generate the data, are written.[127] From the legal perspective both approaches are wrong, as they are incompatible with the traditional interpretation of the scope and criteria of copyright protection. Creation of computer programmes has nothing to do with the rights in products they are used to generate, as the two form different objects of protection, for the purpose of copyright or any other intellectual property rights. Computer programmes, if they fulfil the creativity criterion, without doubt represent protected subject-matter, but this creativity cannot substitute the lack of such in the process of generating remote sensing data with the help of using these computer programmes. By analogy, it would mean that if one makes a photocopy of a painting, this photocopy will be subject to copyright protection, since the painting itself is a product of creativity. Such an interpretation of the application of the creativity criterion is not compatible with the purpose and system of copyright protection regime.

Non-availability of copyright protection for primary remote sensing data alone cannot serve as a good enough reason to justify an artificial stretching of the traditional copyright protection, particularly since it will not necessarily have a positive effect on

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[126] *E.g.* Salin, P. A., *supra* note 124, referring to the practices set up by the SPOT IMAGE, and to Keesey, L. "Value-Added Firms Eye Geographic Sector Growth" Space News (December 3-9, 1990) at 8. It is interesting to note here that even though Salin emphasises the weak point of inability of remote sensing data to qualify for copyright protection, but nevertheless argues in favour unnatural stretch of the scope of copyright protection to include them in its scope.

[127] Raised in particular by people with no legal education.

the development of remote sensing activities.[128] Non-availability of copyright protection for primary remote sensing data gives a chance to companies, who would never be able to launch their own satellites, but have the capabilities and the knowledgeable personnel to produce value-added geographic information products, as for example in the weather forecast services sphere.[129] On the contrary, such situation enables them to enter the market of geographic information products and services, leads to their increased variety, and feeds competition, ultimately contributing to the development of remote sensing activities. Taking into account the trend of vertical integration of remote sensing market,[130] this status quo cannot be seen as negative. From the legal perspective, the process of extending and modifying copyright protection cannot be brought to the stage where it starts protecting the content of works, because this will change the very foundational principle of copyright protection of the original expression only. Since the protection of the actual content of remote sensing data is of the utmost importance for their generators – and usually this is the case – other forms of protection should be developed or adopted instead.

The analysis undertaken shows that primary remote sensing data fail to meet the creativity criterion set forth by the copyright legislation of both the US and the EU. Nevertheless, inapplicability of copyright protection regime does not signify that there are no other ways to protect them. Other regimes that are potentially applicable to this type of data include the European *sui generis* database protection, as well as existing

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128 *See* the discussion regarding the disparities in the development of the European and the US markets of remote sensing data, as well as the figures that reflect it in Loenen van, B. & Zevenbergen, J. "Assessing Geographic Information Enhancement" (2010) 5 *Int. J of Spatial Data Infrastructures* at 245.

129 *See* the comparison of the development of the market of meteorological data *infra*, at 122-123.

130 *See* e.g. forecasts made by Galant, S. "Can EO-based Businesses Expand Profitably in Europe?" (Paper presented at the European Association of Remote Sensing Companies workshop, April 2008).Online: <http://www.eomag.eu/file_download/1/Paper+EARSC+Galant+07+04+08.pdf>; "Business in Earth Observation" Report (May 2008). Online: <http://www.google.com/url?sa=t&source=web&cd=1&ved=0CBYQFjAA&url=http%3A%2F%2Fwww.earsc.eu%2Ffile_download%2F43%2FBusiness%2Bin%2BEarth%2BObservation%2BeoVOX080508.pdf&ei=2AVrTI_gFIL68AbGyPCKBQ&usg=AFQjCNFQPkgCV6Tt8e7D7Mr6GoYDjPlt7g> (last accessed 01.02.2011); Keith, A. & Bochinger, S. "The New Earth Observation Market: Expansion & Private Sector Development" *Satellite Finance* 111 (March 13, 2008) at 31-34.

information licensing practices. Their suitability for remote sensing data is assessed in the following sections.

2. Practical irrelevance of protection of unoriginal databases for remote sensing data

It is not always clear whether unoriginal databases, like yellow pages or other types of listings, can or should be considered as works under the Berne Convention and be protected by copyright. Apart from the fact that they are made for strictly utilitarian purposes, they are often a by-product of the main activity of a database maker. This also concerns databases that contain geographic data, including remote sensing data and information.[131] The inability to grant copyright protection to such databases leaves the legislators with the choice between two basic options. The first is to give database makers more protection[132] that in theory should reduce free-riding and piracy and thereby provide them with more incentives to produce databases in the future. The second is to agree on less protection,[133] in particular in the form of strong proprietary-like regime that will prevent unnecessary restrictions on use of pre-existing ideas and factual information,[134] and to open up more data that eventually will enable more actors to enter the database market.

The size of the information flow by itself, as well as the amount of information that is used today for various purposes, make the increased production of databases a logical market development. Databases are equally or even more so important for the development of science.[135] Collection of data that can be used to conduct research

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131 Onsrud, H.J. & Lopez, X. "Intellectual Property Rights", *supra* note 67.

132 *E.g.* in the form of extended licensing rights.

133 Through may be compulsory licensing with conditions laid down in special regulations.

134 Pluijmers, Y. & Onsrud, H.J. "Commercial Sector Perspectives Regarding Legal Methods for Protecting Spatial Datasets" (1997) *Proceedings of GIS/LIS* at 402-404.

135 "Preserving Scientific Data on Our Physical Universe: A New Strategy for Archiving the Nation's Scientific Information Resources" Steering Committee for the Study on the Long-term Retention of Selected Scientific and Technical Records of the Federal Government, Commission on Physical Sciences, Mathematics, and Applications & National Research Council (1995) at 16. Online: <http://books.nap.edu/openbook/030905186X/html/index.html> (last accessed 01.02.2011).

about the earth and for which remote sensing data are extensively used, is the first step in the creation of new knowledge. For this purpose, the initially compiled databases of geographic data and information are being continually updated and refined, and the data they contain are processed and interpreted to create new data sets, information and ultimately knowledge. Pretty much all remote sensing data received by the ground stations from the satellites are stored in electronic databases from the very moment of their reception. Sometimes, like in the case of the US Landsat programme, archiving is stipulated by national legislation.[136] After their initial processing, data still remain stored in the databases. Despite all the work done to collect, arrange and make data and information accessible, as well as taking into consideration high demand for their contents, a lot of such databases remain compilations of factual information,[137] arrangement of which aims at easy utilisation by the customer rather than creativity. The databases that clearly are not works – not intellectual creations – in the sense of the Berne Convention are as a result protected by other means, like contracts, licensing schemes, trade secrets, etc.

A property-like protection option is so far only adopted by the EU within the framework of the Database Directive that created a unique two-tier protection of databases: by virtue of traditional copyright as intellectual creations on the one hand, and through creation of a *sui generis*[138] database right to prevent unauthorized extraction or reutilisation of the *content* of a database on the other.[139] This section introduces this right and assesses what impact its existence within only one particular jurisdiction or region can have on the development of the database market. Since the issues of

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136 Sec. 5652 US *Remote Sensing Space Policy Act* Pub. L. of 1992 H.R.6133.

137 E.g. law databases like Westlaw, Quicklaw, yellow pages, geographic information systems, etc.

138 *Sui generis*, translated from Latin, means of its own kind or class. *See Black's Law Dictionary*, 9th ed. (St. Paul: West Group, 2009) 1434.

139 *Sui generis* protection is granted irrespective of its eligibility for copyright protection, and is without prejudice to the rights regarding the content of the database, as the ECJ stressed in its Judgement in ECJ, *British Horseracing Board Ltd and others v. William Hill Organisation Ltd*, C-203/02 [2004] OJ C 6 (08.01.2005), para. 4 [*BHB* Case].

copyright in general were discussed above, attention will be turned to the protection of unoriginal databases by virtue of the *sui generis* right.[140]

a. Obscurity of the criteria for protection of unoriginal databases

A database protected by the *sui generis* database right does not necessarily have to differ from those that fulfil the criterion of creativity and are thereby protected by virtue of copyright. According to Recital 17 of the Database Directive Preamble a "database" includes "literary, artistic, musical or other collections of works or collections of other material such as texts, sound, images, numbers, facts, and data" that are "arranged in a systematic or methodical way and individually accessible by electronic or other means."[141] The requirement of the individual accessibility was separately addressed by the European Court of Justice (ECJ) in its case law. The ECJ's comments explained that the single bits of data or information have to be "separable from one another without the value of their contents being affected, including a method or system of some sort for the retrieval of each of its constituent materials." [142] These criteria have to be fulfilled also by all copyrightable databases.

Unlike the copyright requirement of creativity, the *sui generis* protection brings forward the criterion of "substantial investment", this being the most crucial difference between the focus and rationale of the two regimes. The databases protected by the *sui generis* database right should constitute "a collection of independent works, data or other materials making which required substantial investment in terms of the skills, energy

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[140] A more extensive overview of the protection and its implications can be found in my Master's thesis: Doldirina, C. *European Protection of Unoriginal Databases* (Master's Thesis, Bremen University, 2005) [unpublished].

[141] Article 1(2) Database Directive, *supra* note 13.

[142] The latter part of the definition was additionally explained by the ECJ in its decision in Case C-444/02 Fixtures Marketing Ltd v Organismos prognostikon agonon podosfairou AE, 09.11.2004, OJ C 6, 08.01.2005, para. 32 [Fixtures Marketing Case].

and money,"[143] demonstrated either qualitatively or quantitatively.[144] The Database Directive gives little guidance regarding the extent of the substantiality of the investment, except that it must be "substantial enough,"[145] as well as that it must be an investment in the creation of the database as such, and not of its contents.[146] The latter restriction in the interpretation of the Database Directive provisions may be of very high importance for databases that contain remote sensing data and information, since the major part of investment is spent to actually generate remote sensing data themselves.[147]

"Substantial enough" explanation of the required investment is not an easy concept to interpret, which is vividly seen from the practice of the courts of the EU Member States.[148] In Holland, a court found that the cost of collecting and maintaining up-to-

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[143] Article 7(1) Database Directive, *supra* note 13. Surprisingly, the Advocate General (AG) stressed in para. 34 of her Opinion on Case C-302/02 (June 8, 2004). Online: <http://curia.europa.eu/jurisp/cgi-bin/form.pl?lang=en&newform=newform&Submit=Submit&alljur=alljur&jurcdj=jurcdj&jurtpi=jurtpi&jurtfp=jurtfp&alldocrec=alldocrec&docj=docj&docor=docor&docop=docop&docav=docav&docsom=docsom&docinf=docinf&alldocnorec=alldocnorec&docnoj=docnoj&docnoor=docnoor&radtypeord=on&typeord=ALL&docnodecision=docnodecision&allcommjo=allcommjo&affint=affint&affclose=affclose&numaff=C-203%2F02&ddatefs=&mdatefs=&ydatefs=&ddatefe=&mdatefe=&ydatefe=&nomusuel=&domaine=&mots=&resmax=100>(last accessed 01.02.2011), that the main goal of the Directive is the protection of the product, *i.e.* database, while at the same time *indirectly* protects the expenditure incurred in the process, in other words, the investment (with the reference to Grützmacher, M. *Urheber-, Leistungs- und Sui-generis-Schutz von Datenbanken: Eine Untersuching des Europaeischen, Deutschen und Britischen Rechts* (Baden-Baden: Nomos Verlag, 1999) at 329) [AG Opinion BHB Case].

[144] Recital 40 Database Directive, *supra* note 13.

[145] Recital 19 Database Directive, *ibid*.; *see* also AG Opinion Case C-444/02 (June 8, 2004). Online: <http://curia.europa.eu/jurisp/cgi-bin/form.pl?lang=en&jurcdj=jurcdj&numaff=C-444/02&nomusuel=&docnodecision=docnodecision&allcommjo=allcommjo&affint=affint&affclose=affclose&alldocrec=alldocrec&docor=docor&docav=docav&docsom=docsom&docinf=docinf&alldocnorec=alldocnorec&docnoor=docnoor&docppoag=docppoag&radtypeord=on&newform=newform&docj=docj&docop=docop&docnoj=docnoj&typeord=ALL&domaine=&mots=&resmax=100&Submit=Rechercher> (last accessed 01.02.2011), para 49 [AG Opinion Fixtures Marketing Case], with reference to Karnell, G. W. "The European Sui generis Protection of Databases" (2002) *J. Copyright Soc. of the USA* 994.

[146] Paras 31, 32 *BHB* Case, *supra* note 139, with reference to Recital 39 Database Directive; *see* also para. 36 *BHB* Case that explicitly denies inclusion of the costs of creating data into the concept of substantial investment for the purpose of Article 7 Database Directive. For the reasoning behind the norm *see* para. 3 Fixtures Marketing Case, *supra* note 142, referring to recitals 9, 10, 12 of the Database Directive, *supra* note 13.

[147] The investment includes the costs of developing, building and launching satellites, of maintaining the ground stations, as well as of operating them while in orbit.

[148] *See* "First Evaluation Report of Directive 96/6/EC on the legal protection of databases" DG Internal Market and Services Working Paper IP/05/1567 (Brussels, December 12, 2005) para. 4.1.2 and fn.

date information concerning several thousand real estate properties within a database was substantial enough.[149] In Germany, a website containing information on building construction was not proved to have required substantial investment,[150] unlike the weekly German "Top 10" hit chart of music titles.[151] According to the assessment by another German court, the initial investment of around €10 000 in creation of a database may be sufficient to grant its maker protection under the *sui generis* database right.[152]

The investment of a database maker has to be spent, alternatively, to obtain, verify or present the data or other content elements independently generated or created by third parties within the database.[153] Obtaining essentially means gathering data and information generated by *third parties*. It may include such activities as classification of the data and their handling from the moment of the receipt to the inclusion into a database.[154] If the substantial investment is spent to generate own data (to be included into a database), the protection to such a database may be denied.[155] The creator of the contents of a database may be granted protection only if it is proven that the substantial investment in obtaining, verification and presentation of these contents "was independent of the resources used to create those materials."[156] Accordingly, the *sui generis* right cannot be granted to database makers whose databases constitute nothing but a by-product of their main activities. The ECJ supported this interpretation following

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17. Online: <http://ec.europa.eu/internal_market/copyright/docs/databases/evaluation_report_en.pdf> (last accessed 01.02.2011) [First Evaluation Report].

149 *NVM v. De Telegraaf*, the District Court of The Hague [2000]. Cited in Hugenholtz, B. "The New Database Right: Early Case Law from Europe" (Paper at the Annual Conference on International IP Law & Policy, New York: Fordham University School of Law, 19-20 April 2001). Online: <http://www.ivir.nl/publications/hugenholtz/fordham2001.html#noot36> (last accessed 01.02.2011).

150 B*aumarkt.de* OLG Düsseldorf (Court of Appeal of Düsseldorf) [1999] *MMR* 1999, S. 729. *Stadtplanwerk*, *supra* note 150.

151 *Hit Bilanz* BGH (German Federal Court of Justice) [2005] *GRUR* 2005, 857.

152 *Wesentlichkeitsgrenze beim Datenbankschutz* OLG Koeln (Court of Appeal of Cologne) [2008] *MIR* 01/2009.

153 Article 7 Database Directive, *supra* note 13.

154 AG Opinion *Fixtures Marketing* Case, *supra* note 145, para. 48.

155 Para. 4.1.4. "First Evaluation Report", *supra* note 148.

156 Para. 35 ECJ BHB Case, *supra* note 139.

the argument of the Advocate General[157] that "the so-called 'spin-off theory' *cannot* apply."[158]

Such an interpretation of the substantial investment in obtaining data and contents of a database suggests that the owners or operators of remote sensing satellites and subsequently of the data these satellites generate will most likely not be considered as database makers, since their substantial investment is spent to actually generate the data, and not to gather them from third parties. It is rather the immediate users of remote sensing data, like distributing or value adding companies, who fulfil the criterion of the substantial investment in obtaining the contents of a database.[159]

In case of not fulfilling the first option of spending the substantial investment for obtaining the contents of a database, the database maker may still be granted the *sui generis* right: the two other activities substantial investment in which may trigger the protection are verification and presentation. Verification is limited to ensuring the veracity and accuracy of data within[160] a database, and includes such activities as monitoring the contents of a database in respect of completeness and actuality. This process may involve obtaining of new data, but this is not a requirement.[161] Presentation entails external presentation to users and the conceptual format of the contents' structure.

Further complications refer to the actual subject-matter of protection by the *sui generis* right. Article 7(1) of the Database Directive states that *sui generis* database right forbids

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157 Despite her overall position in favour of a very broad and encompassing *sui generis* database protection: the word "wide" is used seven times in this context, the phrase "not too strict," twice within the opinion delivered to the ECJ.

158 Para. 47 AG Opinion BHB Case, *supra* note 143, emphasis added. *See* also paras 24, 30 ECJ BHB Case, *supra* note 139 and paras 34, 39 *Fixtures Marketing* Case, *supra* note 142, that state that the *sui generis* right should promote the systems to store and process existing information, and not the creation of materials that can be combined in a database. National courts of the EU Member States follow this interpretation: according to a Dutch court a database containing newspaper headlines, due to their by-product of newspaper publishing nature could not be protected by *sui generis* database right. *See* Hugenholtz, B. "The New Database Right", *supra* note 149.

159 Which makes the support of satellite owners for such a regulation (or approach) quite ridiculous.

160 AG Opinion *BHB* Case, *supra* note 143, para. 51.

161 *Ibid*., para 52.

any database user to extract and/or re-utilise "the whole ... or a substantial part ... of the contents" of a protected database. The wording is not exactly clear with the regard to what the term "content" means. As some of the sources that deal with the interpretation of the Database Directive suggest, content of a database that is protected from extraction or re-utilisation is "information in the widest sense of that term,"[162] although at the same time it has been argued that the Database Directive does not protect information as such.[163] Due to the ambiguities in the interpretation of the Database Directive by the Advocate General, the actual object of the *sui generis* right's protection becomes even more difficult, as the definition of the database contents is given through the concept of "data" which is in its turn defined through "informative content".[164]

With these observations in mind, it is now time to assess in greater detail the applicability of the Database Directive's provisions to the databases containing remote sensing data or information, and to find out whether they fulfil the criteria of granting the *sui generis* right to their makers.

b. Problems of application to remote sensing data

Databases are the best means to manage and make easily accessible huge bulks of data that are currently being generated by remote sensing satellites across the globe.[165] These databases are constructed in a way that meets the purpose of efficient retrieval and access of data. As the analysis in the section of applicability of copyright protection to remote sensing databases has shown, very often they do not fulfil the criterion of

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[162] Explanatory Memorandum, in Hugenholtz, B. "The New Database Right", *supra* note 149.

[163] AG Opinion *BHB* Case, para 34, *supra* note 143.

[164] For the discussion regarding metadata and the scope of database protection, both by virtue of copyright and of the *sui generis* database right *see* Fuchs, T. "Die Gemeinfreiheit von amtlichen Datenbanken" (2008) 1*UFITA* 1.

[165] *See* e.g. the analysis of suitable databases for remote sensing data in Dong, S. & Hu Qiaoli "Building remote sensing database on Grid" in *Geoscience and Remote Sensing Symposium Proceedings* (2005) 257.

creativity and therefore are left outside its scope. The aim of this section is to analyse whether databases containing primary remote sensing data are eligible for the EU *sui generis* database protection. The eligibility of databases containing remote sensing data for this type of intellectual property protection depends on their fulfilment of Articles 1 and 7 of the Database Directive's provisions. This analysis should in essence answer two questions: whether they are databases, and whether there is substantial investment in obtaining, verification and presentation of the data that constitute their content. In order to accomplish this tasks the verbatim meaning of the relevant provisions of the Database Directive, as well as their interpretation by the courts of different jurisdictions are used.

i. Remote sensing data databases

A database containing remote sensing data can be a database in the sense of the Database Directive for a number of reasons. Firstly, it represents a collection of independent data that are not necessarily connected with each other content-wise. Moreover, with the course of time databases were chosen as a means to store remote sensing data due to the retrieval mechanisms inbuilt in them and they substituted other, less convenient file-storing systems, which are not as easy to operate and maintain. Secondly, data constituting contents of a database must be "arranged in a systematic or methodical way and individually accessible by electronic or other means."[166] This condition is met by databases containing remote sensing data and information, since they have to be searchable in order to extract the data that their users need and have requested. Moreover, the "searchability" of a database is crucial in order to retrieve different sets of data that either on their own or in combination with each other can serve a certain purpose or be used to make an information product with desired content characteristics. Even in cases where the data are not initially arranged in a systematic or

[166] Recital 17 Preamble and Article 1(2) Database Directive, *supra* note 13.

methodical way, but the database provides for a search mechanism[167] through which such arrangement eventually takes place, the conditions of Article 1 of the Database Directive are met.[168]

Taking these two main considerations together, the databases containing remote sensing data should be qualified as such. The issue may be more complicated if processed remote sensing data are involved, or the geographic information systems (GIS) or digital maps come into play. Even if from the first sight making of more complicated databases containing processed material and even information or knowledge seems to require more investment in both qualitative and quantitative terms, the question has not received a clear-cut answer. For instance, the Regional Court of Munich gave two opposite answers as to whether topographic maps or their selections are databases protected by the *sui generis* database right. In 2000 it ruled that a single topographic map was not a database in the sense of §87a German Copyright law that incorporates the Database Directive, and that the courts should be free to assess whether a collection of them would be qualified as one.[169] And in 2005 it said every map (page) of the topographic maps of the Free State Bavaria was a database eligible for protection.[170]

ii. Are investments made to do the right things?

In order to qualify for the *sui generis* database protection the databases containing remote sensing data and information should fulfil the second criterion: be made by virtue of qualitative or quantitative substantial investment. This assessment is more complicated due to the characteristics of the provisions of the Database Directive that

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[167] In the original "Abfragesystem", which can be also translated as "query system" or "retrieval system".

[168] *Wesentlichkeitsgrenze beim Datenbankschutz*, *supra* note 152, with reference to Directive 96/9/EG Preamble recital 21. It should be noted that such mechanism should not be a simple numbering of the elements of a collection.

[169] *Topographische Karten* I Landgericht München (District Court Munich)[2005] *GRUR* 2006, 225.

[170] *Ibid*.

were highlighted in the previous section, such as their vague and broad wording that leaves room for quite different interpretations.

In order for a database of remote sensing data to qualify for the *sui generis* database protection, the substantial investment has to be made to obtain, verify or present its contents. According to the *Wetterdatenbanken* case of the Cologne court mentioned above, the substantiality criterion should be interpreted taking into account the broad definition of the database, as to exclude only very insignificant and objectively minimal expenditures.[171] Despite the extensive amount of literature[172] that deals with the issue of remote sensing data and the means of their storage, dissemination and utilisation, the majority of authors, unfortunately, do not provide any information with regard to the costs of setting up and managing databases containing remote sensing data. Instead, their economic analysis of remote sensing data availability focuses either on the benefits for the development of the secondary market of remote sensing data and information, or on its economic impact on the industries where such data and information products are used.

For the correct assessment of the eligibility of a database that contains remote sensing data for the *sui generis* database protection, the investment made to generate the data has to be separated from the investment spent to set up the database. This issue is linked to the spin-off doctrine that was rejected by the ECJ, as illustrated in the previous section. It is indisputable that generation of remote sensing data is expensive:[173] the

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171 The logic behind such an interpretation is that small databases should not be excluded from the protection by the *sui generis* database right. Whether such a standpoint will become the rule of interpretation for the concept of „substantial investment" is not clear though.

172 *See* e.g. Harris, J. "New Technologies and Data Integration" (2000) 16 *Space Policy* 77-78; Harris, R. & Olby, N. "Pricing Policy and Legal Issues: 6th and 7th EOPOLE Workshops" (2000) 16 *Space Policy* 287; Harris, R. & Olby, N. "Earth Observation Data Archiving in the USA and Europe" (2001) 17 *Space Policy* 35; Tateishi, R. & Hastings, D. "For a Better Direction of the Development of Global Environmental Databases" in Frutsch, D. Englich, M & Sester, M. eds., *GIS – Between Visions and Applications IAPRS* vol. 32, part 4 (Stuttgart: ISPRS, 1998); Zell, E. *et al.* "Application of Satellite Sensor Data and Models for Energy Management" (2008) 1:1 *IEEE J. Selected Topics in Applied Earth Observations and Remote Sensing* 5.

173 As a part of overall remote sensing activities that include production of the satellite, its launch and operation, as well as management and maintenance of the ground facilities that are utilised to task the satellites, receive and store generated data.

cost of producing and launching a remote sensing satellite alone can amount to tens of millions of dollars[174] and exceed hundreds of millions of dollars.[175] Even the use of micro- or mini-satellites, production of which can be as low as US$3 million,[176] by far exceeds the expenditures that the European courts find substantial enough for a database to qualify for the *sui generis* protection.[177] Nevertheless, strict adherence to the provisions of the Database Directive and their interpretation as per ECJ and the national courts of the EU Member States will in fact favour those database makers who acquire remote sensing data from third party sources and then compile them in a database.

The European remote sensing data generators who also maintain relevant databases in order to qualify for protection should ensure that the substantial investment is made to verify or present the data. It is hard to imagine how the generators of remote sensing data would face the need to verify them in the sense of ensuring their reliability and of monitoring their accuracy.[178] Firstly, the reliability is not necessarily an issue for the entities who generate remote sensing data, as they are the initial recipients of the data. Secondly, remote sensing data are always accurate in the sense that they always reflect the reality, although they might not be of sufficient quality, resolution, or the sensor used to acquire a particular data-set might not be suitable for a specific application. The latter is more of a factor to take into account when processing data or making information products, both of which happen at the stage of value-adding activities, and

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174 The first two CBERS satellites cost together with the launch US$150 million. *See* information from the Brazilian National Institute for Space Research, online: <http://www.cbers.inpe.br/en/programas/faq.htm>. The German satellite TerraSAR-X was developed and launched for the total cost of US$160 million. *See* "TerraSAR-X – German Radar Satellite Launch Successful German Aerospace Centre" Press Release (June 15, 2007). Online: <http://www.dlr.de/en/desktopdefault.aspx/tabid-1/86_read-9475/> (last accessed 01.02.2011).

175 For instance a Venezuelan remote sensing satellite (including launching and ground station costs) required expenditure of around US$406 million. *See* Barbosa, R.C. "China Launch Venesat-1 – Debut bird for Venezuela" *NASA Spaceflight* (October 29, 2008). Online: <http://www.nasaspaceflight.com/2008/10/china-launch-venesat> (last accessed 01.02.2011).

176 Sweeting, M. & Fouquet, M. "Earth Observation Using Low Cost Micro/Minisatellites" (1996) 39 *Acta Astronautica* at 823-826.

177 *See* examples in the section above.

178 Recital 34 Preamble Database Directive, *supra* note 13.

not the initial incorporation of data into a database. The third qualifying activity – presentation – is not very well defined in the Database Directive or case-law. Taking into account, on the one hand, that the threshold of "substantial enough" can be quite low, and the bulkiness of the databases containing remote sensing data[179] on the other, the argument against substantiality of investment in the presentation of their contents does not seem to be strong.

As a result, despite the potential application of *sui generis* right to databases that contain remote sensing data, this type of protection is hardly effective enough for a number of reasons. The key provisions of the Database Directive are vague, which allows broad interpretation and cause disparities and inconsistencies among decisions of the national courts regarding the protected subject-matter and the scope of the right, as has been shown above. Furthermore, some of the producers of database do not even fully understand what the new right is about.[180] In addition, database *sui generis* protection does not prove to be truly effective in economic terms. In its assessment of the Database Directive the Internal Market and Services Directorate General (DG Market) has not found evidence of its positive impact on the development of the database industry in Europe.[181] Finally, the "regionality" of this instrument coupled with the reluctance of other countries, including the US, to adopt similar protection mechanisms, does not add to its effectiveness as a protection mechanism for the European databases, data from which can and are used all over the world, as in case with many databases that contain remote sensing data and information.

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[179] The essential conclusion from this fact is that if there is so much data, it will inevitably cost a lot to present it within a database, even if this database is the simplest of all regarding its structure and other characteristics.

[180] *See* the Terms and Conditions for the Utilisation of Data under the ESA Category-1 Scheme. V05/03/10 (March 3, 2010) Living Annex, 2, SPOT terms and conditions amendments: the *sui generis* protection is addressed as "database copyright" under the Directive on database copyright. Online: <http://eopi.esa.int/esa/esa?type=file&table=aotarget&cmd=image&id=122> (last accessed 01.02.2011) [ESA Category-1 Scheme].

[181] Moreover, the economic gap with the US industry was not reduced. *See* "First Evaluation Report", *supra* note 148, at 5, 23, 24.

3. Foreclosure of remote sensing data through current licensing practices

The most widely used mechanism to enforce regulations that set up the protection regimes for intellectual property assets, is a licence that transfers certain rights from the rightholder to a user. In the sphere of remote sensing activities many governmental agencies international organisations and private companies develop their own data policies and licensing conditions applicable to the generation, use and distribution of remote sensing data. The contracts that usually take the form of a licence are widely used at two different stages of remote sensing activities – the actual conduct of remote sensing activities, in particular by private entities,[182] including the issues of security, clearance, confidentiality on the one hand, and protection mechanisms that affect subsequent dissemination of remote sensing data on the other.[183]

The first type is the public law licence that allows a (private) remote sensing satellite operator to engage into remote sensing activities. It stipulates, *inter alia*, the requirements of data protection (security) and disposal, as well as certain norms regarding users to whom the acquired data may be licensed. These licences have nothing to do with the protection of remote sensing data and information as such, but are issued to secure compliance with the rules framing the remote sensing activity itself. Since they deal with the actual operation of remote sensing satellites or systems, they fall outside the scope of the current analysis and are not addressed.

The second type of licences is linked to the distribution of remote sensing data as an object of intellectual property protection. It is a mechanism that establishes the rights and obligations with regard to the licensed data. For the time being, most remote sensing activities are carried out by governments of different states themselves or in cooperation with the private sector. Therefore, relevant norms regarding the status of generated and distributed data are contained in the data policies and regulations

[182] These licences or licensing policies usually address the issues of security, clearance and confidentiality.

[183] Mann, B. "Drafting Legislation to Regulate Commercial Remote Sensing Satellites: a How-To Guide from Canada" in 49*th Colloquium on the Law of Outer Space* (2006) 3.

adopted by the governments or governmental organisations. Some remote sensing satellites are operated by private entities, or the latter are in charge of the distribution of remote sensing data acquired by publicly owned satellites. In this case, private law licensing mechanisms are used. Both such policies and licences are analysed below with the aim to see how the existing regulations regarding protection of intellectual property are reflected in the data policies and are transposed into the individual licensing mechanisms. A few examples of both data policies and licensing schemes used in the US and Europe are discussed to compare their premises and conditions.

a. Licensing policies of governmental entities

i. Myth of developing the remote sensing data market in Europe

In Europe, without doubt, the European Space Agency (ESA) is the most significant player in the field of remote sensing activities, both due to the missions it operates, and to the established cooperative network with the domestic and foreign generators of remote sensing data.[184] ESA has adopted several data policies that determine ownership and use of remote sensing data, and lay down the principles of their protection and distribution. They have to be implemented by the ESA member states within their respective territories[185] to ensure continuity and consistency of the adopted policies in different jurisdictions.

ESA owns the results of its activities, including the data from the projects it runs.[186] More specifically, its remote sensing data policies[187] lay down that ESA maintains

[184] Basic information on ESA's remote sensing activities is available online: <http://earth.esa.int/object/index.cfm?fobjectid=5065> (last accessed 01.02.2011).

[185] 6.2. Envisat Data Policy (February 19, 1998). Online: <http://eopi.esa.int/doc/download/envisat_data.pdf> (last accessed 01.02.2011).

[186] Article V *Convention for the Establishment of a European Space Agency*, May 30, 1975 Ref. CSE CS(73)19, rev. 7. Online <http://www.esa.int/convention> (last accessed 01.02.2011).

[187] *See* e.g. Earth Explorer Data Policy (February 2, 2006). Online: <http://eopi.esa.int/esa/esa?type=file&ts=1173801698591&table=aotarget&cmd=image&id=1420> (last accessed 01.02.2011); Envisat Data Policy, *supra* note 185.

ownership[188] over both primary remote sensing data[189] and information products made for or by ESA or otherwise, if the contribution from its data is substantial and recognisable.[190] Ownership of ESA over the data has to be clearly marked.[191] The rules regarding ownership determine the characteristic feature of ESA's and European licensing schemes that are marked by extensive control over the activities of data licensees. This is also reaffirmed in the ESA Rules on Information, Data and Intellectual Property.[192]

Any licensed data may not be further distributed without a prior agreement with either ESA or specially designated distributing entities, who retain intellectual property rights in them.[193] Only a sufficient degree of processing resulting in the creation by the licensee of new products *may* give the licensee the right to claim the intellectual property rights and rights to freely distribute the created products.[194] The term "sufficient" is left for a case-by-case interpretation. As the data owner, ESA is entitled to protection provided for by copyright, *sui generis* database right, as well as other forms of intellectual property rights. Unfortunately, its data policies do not describe how exactly these mechanisms are applicable to remote sensing data, leaving the law to find its own way.

Distribution modes of and prices on ESA remote sensing data depend on the category of data use: research and application development uses in support of mission objectives,

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188 *See* e.g. 1.5. Envisat Data Policy, *ibid.*; Earth Explorer Data Policy, p. 1, *ibid.*

189 Also called "raw data" in Annex A to the Envisat Data Policy, *ibid*.

190 Annex A divides them into two levels of products: level 1b – "geolocated engineering calibrated product", and level 2 – "geolocated geophysical products". None of the terms is defined.

191 C.1. ESA Category-1 Scheme, *supra* note 180.

192 Chapter V "Ownership, Access, Use and Dissemination of Raw and Calibrated Data Resulting from a Programme or Activity of the Agency" ESA/C/CLV/Rules 5 (Final) (December 19, 2001). Note that the document is nowhere to find on the internet. Reference to it is available, for instance, in "Venus Express: A European Venus Orbiter" Science Management Plan (April, 2005). Online: <http://www.lpi.usra.edu/vexag/management_plan.pdf> (last accessed 01.02.2011). For the general overview *see* Eisermann, K. & Grafe C. "Intellectual Property Rights: a New Regime in ESA Contracts" 118 *ESA Bulletin* (May 2004). Online: <http://telecom.esa.int/telecom/media/document/Intellectual_property_rights.pdf> (last accessed 01.02.2011).

193 3.2.5. Envisat Data Policy, *supra* note 185.

194 *Ibid*. emphasis added.

as well as uses within ESA functions and for internal ESA purposes belong to Category-1 Use, and all other uses – to Category-2 Use.[195] Distribution of remote sensing data under both categories shall be carried out in accordance with the UN Remote Sensing Principles, which contributes to non-discrimination with regard to different categories of users but has no implications on the intellectual property issues associated with the use of data. ESA, not being a profit-oriented organisation,[196] is responsible solely for the distribution of data under Category-1 Use and provides them at or close to the cost of reproduction.[197]

As a trade-off to the low cost of the remote sensing data and information provided under Category-1 Use, the distribution of data is always linked to an approved project or a chosen institution. Furthermore, the users are not allowed to make profit from the licensed data, or distribute them to third parties. Specific norms that govern activities of the licensees under the Category-1 Use are contained, for example in Part B of the Terms and Conditions for the Utilisation of Data under the ESA Category-1 Scheme.[198] The licensee has the obligation to report to ESA any (potential) violations of rights over data by third parties within his area of activity.[199] If the licensee creates his own works directly using ESA data, he has to grant ESA a free of charge irrevocable and non-exclusive license to use them for space research and technology.[200] Finally distribution through Category -1 Scheme is said to be a lengthy process that sometimes renders data useless because of the time spent to meet the request.[201]

Alongside fostering research and not-for-profit useful activities, ESA's data policies aim to create "the conditions for the private sector to invest in new products and

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195 *Ibid*., 2.2. Rules to identify a Category-1 user are provided in Annex C.

196 *Ibid*., 1.2.

197 3.2. Envisat Data Policy, *ibid*. Details with regard to this for this type of data use are laid down in ESA Category-1 Scheme, *supra* note 180.

198 ESA Category-1 Scheme, i*bid*.

199 *Ibid*. C.3.

200 *Ibid*. C.5.

201 Personal interviews.

services,"[202] as well as to use remote sensing data and related information products more extensively.[203] This happens through the distribution of remote sensing data to Category-2 users by special distributing entities.[204] Appointed by ESA, they enjoy freedom of price-determination for their services and products that they acquire at marginal cost.[205] The distributing entities are required to guarantee access of value-adding companies and service providers to the remote sensing data they are in possession of,[206] but are also granted the right to sell products and services to users directly.[207] Apart from the general rules regarding distribution of ESA remote sensing data, ESA data policies contain very little detail on how the activities of the distributing entities should be set up and run. Since the two current Category-2 Use distributing entities are SPOT Image and Eurimage,[208] the licences they use to conduct their distribution activities are analysed in the next section of this chapter.

The European trend of privatising publicly generated remote sensing data is alarming and happens not only on the ESA level, but within EU Member States as well. For instance, the French SPOT remote sensing satellites are commercially operated by SPOT Image, which is also the exclusive distributor of remote sensing data from these satellites.[209] This means that a state programme – a constellation of remote sensing satellites – initiated and funded by the French government is, from its inception, run by a commercial entity under market conditions. Another example is the recently adopted German Law on the Security of Satellite Data that prescribes, even in cases of

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202 ESA Category-1 Scheme, *supra* note 180.

203 2.5. Envisat Data Policy, *supra* note 185.

204 A little later the difference of this approach from the US data policies will become visible when the latter are discussed in the next sub-section.

205 According to 3.1. Envisat Data Policy, *supra* note 185. Note that according to 3.3. Envisat Data Policy ESA reserves itself the right to set the highest market price for the data.

206 6.6. Envisat Data Policy, *ibid*. It is not clear who the "value-added operators and service providers" exactly are.

207 *Ibid*., 6.5.: "Distributing entities shall *ensure* the marketing of the Envisat data along with *the access* to the associated necessary services: *satellite programming*, acquisition of data, processing, archiving, cataloguing and dissemination."

208 *See* online: <http://envisat.esa.int/handbooks/aatsr/CNTR1-1.htm> (last accessed 01.02.2011).

209 *See* online: <http://www.spot.com/web/SICORP/456-sicorp-about-us.php> (last accessed 01.02.2011).

emergency situations. the German government to pay a normal market price for remote sensing data acquired by German satellites.[210] This is explained by the primary goal of the law – to foster the development of the commercial remote sensing industry with the prospects of world-wide sales.[211] The trends regarding data distribution policies adopted and enforced in the US, as well as their comparison with the European approach is discussed below.

ii. Reality of the remote sensing data market in the US

Remote sensing activities in the US in the first place are carried out by the National Aeronautics and Space Administration (NASA) responsible for the coordination and execution of the US civil space programme;[212] the National Oceanographic and Atmospheric Administration (NOAA) that operates some of the US remote sensing satellites[213] and licenses private remote sensing satellite systems,[214] and the US Geological Survey (USGS) – the central mapping agency in the US and a provider of scientific information about the Earth.[215] All these agencies, USGS being the lead, are also involved in the implementation and execution of the Civil Agency Implementation Plan of the US Commercial Remote Sensing Space Policy[216] that lays down the public law norms regarding licensing of remote sensing activities, the relationship of the US

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210 Article 23 German Law on the Security of Satellite Data, *supra* note 107.

211 Comments made in the German Federal Government's draft. Entwurf eines Gesetzes zum Schutz vor Gefährdung der Sicherheit der Bundesrepublik Deutschland durch das Verbreiten von hochwertigen Erdfernerkundungsdaten.Deutscher Bundestag, 16/4763 (March 21, 2007). Online: <http://dipbt.bundestag.de/dip21/btd/16/047/1604763.pdf> (last accessed 01.02.2011).

212 Sec. 203 and Title II in general, of the National Aeronautics and Space Act. Pub. L. of 1958. 72 Stat. 426 as amended.

213 Including weather satellites. *See* online: <http://www.nesdis.noaa.gov/SatInformation.html> (last accessed 01.02.2011).

214 *See* online: <http://www.licensing.noaa.gov/> (last accessed 01.02.2011).

215 *See* online: <http://www.usgs.gov/aboutusgs/> (last accessed 01.02.2011).

216 US, *Commercial Remote Sensing Space Policy: Civil Agency Implementation Plan* (December 12, 2003) at iv. Online: <http://crssp.usgs.gov/pdfs/CRSSPplan121203.pdf> (last accessed 01.02.2011).

government and private operators of remote sensing satellites, as well as access to remote sensing data by foreign entities.[217]

All these bodies are part of the US federal government structure, and therefore acquire no copyright over the data or information they generate.[218] Moreover, they have an obligation to place such data and information into the public domain[219] and make them available at the cost of fulfilling user-request[220] for not-for-profit and commercial uses equally. Such is the practice with unenhanced data[221] from the longest civilian remote sensing mission of all times Landsat.[222] This is the major difference in the treatment of data and information, including remote sensing data, in comparison to the regime established by ESA, as well as in a lot of the EU Member States. That is why websites of the US governmental agencies do not contain information about licences: one does not need an authorisation to use government-produced or held data and information, provided the user indicates the ownership of the data when using them. An illustration is NASA Earth Observatory project, image use policy of which supports the free use, with the only stipulation to credit the owner of the data or images.[223]

Nevertheless, the government agencies are authorised to control the release of the data and information they produce, which above all means that they are responsible for the data, access to them and their distribution. Also, if a work is produced under a contract with a non-governmental actor, a government agency retains rights in all the data that it licensed to the user, as well as in the data produced under the licence. It also remains in

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217 *See* e.g. Part I of the US Commercial Remote Sensing Policy Fact Sheet (April 15, 2003). Online: <http://crssp.usgs.gov/pdfs/factsheet.pdf> (last accessed 01.02.2011).

218 § 105 US Copyright Act, *supra* note 80.

219 Requirement for remote sensing data is laid down in Sec. 502 (d) Land Remote Sensing Policy Act, *supra* note 58.

220 *Ibid*., Sec. 105(a).

221 Equals primary.

222 *See* online: <http://landsat.gsfc.nasa.gov/> (last accessed 01.02.2011).

223 *See* online: <http://earthobservatory.nasa.gov/ImageUse/>. The same works for NASA in general: on its website it is explicitly stated that the contents of the website (including databases, publications, imagery etc.) are not copyrighted and do not require a licence for use. *See* online: <http://www.nasa.gov/audience/formedia/features/MP_Photo_Guidelines.html> (last accessed 01.02.2011).

the position to authorise their further use and distribution.[224] Such scenario is similar to the European one, where ESA, notwithstanding whether it gets the title over the new products under a Category-1 Use data license, retains the right to use them for its own purposes.[225]

The framework of the relationship between the US governmental agencies and the private sector is different from the one established within ESA. First of all, the US government, being the major purchaser of the remote sensing data, plays a role of the mediator between the private companies and their business interests and the potential users of their data and information, who are not able to pay market prices for them. Initially, the scenario may seem similar to the ESA Category-1 Use regime, except that ESA is in the first place distributing its own data, whereas the US facilitates access to privately-generated remote sensing data as well, which contributes to the development of the secondary market of value-adding activities. The US governmental agencies conclude contracts with the private generators of remote sensing data that are adapted, contain "customized product or delivery options, improve buying power,[226] and expand licensing provisions" in order "to immediately benefit the civil community."[227]

The milestones of data policies and regulations adopted in Europe and the US show that the very premises on which they are based differ substantially and pertain to the most important aspects of data distribution and use, like ownership, the price of data, and their overall availability. Analysis of the private licensing mechanisms with regard to distribution and use of remote sensing data is presented in the next section. It addresses the major issues of ownership and use-rights and serves the purpose of establishing how different the private practices can be from those of governmental

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224 *See* the general data rights provisions in the US Federal Acquisition Regulations (FAR 52.227-14).

225 *See* previous sub-section.

226 Operators of private remote sensing satellite systems may be required (within the granted licence) to make available unenhanced data from their satellites to US government and its affiliated users at reduced prices, Sec 202 (b)(3) *Land Remote Sensing Policy Act*, *supra* note 58. The conditions of the data provision are laid down in Sec. 501(b).

227 Commercial Remote Sensing Space Policy: Civil Agency Implementation Plan, *supra* note 216.

policies, as well as how they can go against the very essence of the protection mechanism they utilise.

b. Flaws of private data licences

All private companies that generate or distribute remote sensing data set up their relationships with the users through licensing agreements that have to be accepted by the licensees in order to get a set of remote sensing data or any other information product. Licensing practices of three companies are discussed in this section: French SPOT Image,[228] US GeoEye[229] and Italian/German Eurimage.[230] The first two operate their own satellites, the US GeoEye being one of the few purely private entities to operate remote sensing satellites and to distribute generated data. Eurimage distributes data and information products generated by other entities and together with SPOT Image is the official distributing entity of the data for ESA Category-2 Use.

The analysis of their end-user licensing agreements shows that despite the differences in wording and terms they are similar, especially when it comes to the most important

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[228] SPOT General Supply Conditions of Satellite Imagery Products (January, 2008). Online: <http://www.spotimage.fr/automne_modules_files/standard/public/p1547_12d17ab018286bc20294ba4d7a904989supply_conditions_2008.pdf> [SPOT General Supply Conditions]; SPOT general EULA, University Standard Licence (January, 2008). Online: <http://www.spotimage.fr/automne_modules_files/standard/public/p1427_7bdcbcd6a452342c08119950f12b0f96University_EULA.pdf>; Non-Exclusive License to Use SPOTmaps Products Between SPOT Image Corporation and the End-User (January, 2008). Online: <http://www.spotimage.fr/automne_modules_files/standard/public/p1427_0e1ff6b2ecdfea6195bb6011cd3ec4c4eula__SPOTMaps.pdf>; Non-Exclusive License to Use SPOT Satellite Products Between SPOT Image Corporation and the End-User (January, 2008). Online: <http://www.spotimage.fr/automne_modules_files/standard/public/p1427_9d709b1bd850b040110d9d66db425dd2multi-eulaSpot_010108.pdf>. [SPOT Standard Licence] (last accessed 01.02.2011).

[229] GeoEye Data Single or Multiple Organization Licence. Online: <http://www.americaview.org/docs/GeoEye_SingleOrganization_license.txt> (last accessed 01.02.2011) [GeoEye Licence]. Note that no licences are available from the Geoeye website a online <www.geoeye.com>.

[230] Eurimage Standard Terms and Conditions of Licence (March, 2009).Online: <http://www.eurimage.com/products/docs/standard_terms.pdf> [Eurimage Licence]; Addendum to the Eurimage Standard Terms and Conditions of Licence "Eurimage End Use Terms and Conditions of License for Quickbird and WorldView-1 Products" (March, 2009). Online: <http://www.eurimage.com/products/docs/Addendum_QB_WV-1.pdf> (last accessed 01.02.2011).

licensing clauses, such as permitted uses of the licensed products, the ownership and intellectual property clauses. Other provisions, in particular regarding categorisation and status of the derivative products made by the licensee, vary from one licence to the other and cause confusion as to the proper interpretation of the terms used. The assessment of the licensing conditions from the perspective of copyright protection, which all three companies claim is applicable to their data, shows that they are not always compatible with the spirit and traditional interpretation of its scope. The danger of locking-up the data and of their underuse that may result from such misinterpretation reinforces the argument that remote sensing data and information have to be shared more extensively and on principles different from those underlying the licensing mechanisms of the private companies. The main clauses that are analysed in this section pertain to the ownership, categorisation of data, modes of their protection and the permitted uses of the licensed material. The key findings are summarised in the comparative table in the end of this section.

i. Core licensing clauses tie up the data-user

The licences stress that the licensors retain the ownership over licensed remote sensing data or information products. All remote sensing data and information distributed by SPOT Image are owned by the French space agency Centre National d'Études Spatiales (CNES).[231] GeoEye is the owner of the data it distributes, whereas Eurimage, not operating any satellites of its own, shares the ownership over the distributed remote sensing data and information with satellite or ground station operators.[232] As a result, solely the non-transferable, non-exclusive limited rights to use the remote sensing data or information are granted to the licensee.[233] Such scheme resembles clauses of non-exclusive licences that retain certain rights with the owner of an intellectual property

[231] Centre National d'Etudes Spatiales. The ownership clause is contained in Article 3 SPOT Image Standard Licence, *supra* note 228.

[232] 2.4. Eurimage Standard Licence, *supra* note 230.

[233] 2.1. SPOT General Supply Conditions, *supra* note 228; 2.1. Eurimage Licence, *supra* note 230; 4 GeoEye Licence, *supra* note 229.

asset, and in itself is compatible with the relevant provisions of copyright protection regime.

What goes against the traditional interpretation of copyright rules is that each of the licences analysed, in addition to determining that the licensor remains the owner of the intellectual property rights vested in the remote sensing data and information, states that licensor also remains the *owner of the copies* of the products physically transferred to the licensee.[234] GeoEye licence goes on to explicitly specify that an end user license agreement is "NOT an agreement for sale." Such clause goes against two of the main aspects of copyright protection regime. Firstly, copyright law never associates rights in a protected work with the ownership of the actual physical copies of it.[235] Some of national laws, like in the US, expressly state that these two concepts – rights in a work and rights in the copy of the work – are distinct from each other.[236] Inserting licensing clauses that go against this fundamental principle of copyright protection that reflects its essence and one of the main characteristics, is against the spirit of the copyright law, and in such cases reference to the protection by virtue of copyright may not have a legitimate ground. Secondly, transfer of data under a licence is a form of enforcing the distribution right that is one of the recognised rights of authors. The WIPO Copyright Treaty explicitly states that such use of copyrighted works only occurs through *sale* or other *transfer of ownership*.[237] If the licensors claim copyright protection over the material they license they may not alter the essence and the pattern of use of the rights as laid down in the relevant legal rules if they wish to remain under their protection.

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234 SPOT General Supply Conditions, *supra* note 228: "No CLIENT shall be able to claim an exclusive right of use on the PRODUCT"; part 2.1 "License to Use" of the Eurimage Licence, *supra* note 230; para. 3 GeoEye Licence, *supra* note 229.

235 § 17 German Copyright Law, *supra* note 80, that authorises further distribution of the copies of works that were legitimately authorised for distribution without additional consent of the rightholder.

236 § 202 (Ownership of copyright as distinct from ownership of material object) of the US Copyright Act, *supra* note 80.

237 Article 6(1), emphasis added, *supra* note 18. In the EU the ECJ had a chance to interpret the distribution right under the Information Society Directive and confirmed transfer of ownership as its constitutive element. *See Peek & Cloppenburg v Cassina* C-456/06 [2008] *OJ C* 142/7 (07.06.2008).

The uncertainty as to whether remote sensing data can be effectively protected by virtue of the copyright regime is manifested in the attempt of the companies to safeguard the licensed data otherwise. For instance, under SPOT Image and Eurimage licences the data or products constitute trade secrets, and the licensee agrees to protect their status as such.[238] Both European companies emphasise that the *sui generis* database protection is also applicable to the materials made available through their licences.[239] Whether and to what extent these regimes are applicable to the licensed data should ideally be assessed on the case-by-case basis, which of course does not happen in practice. Apart from the ownership and protection regime clauses, another important feature – absence of differentiation between primary remote sensing data and analysed information – may negatively impact application of the protection regimes to remote sensing data and information that public laws and regulations establish.

The licences of all three companies do not make differentiation among the types of remote sensing data as per UN Remote Sensing Principles despite that some countries[240] recognised them within their national regulations. SPOT Image uses the term "product", Eurimage operates with the two-headed "Satellite Data/Product", and GeoEye calls all its materials (including both unprocessed data and imagery information products) "data". In practice this means, for instance, that both primary remote sensing data and analysed information are protected by copyright, which according to analysis of applicability of copyright protection to them is wrong. This claim, together with the stipulation that the licensee unconditionally agrees with the terms of the licence, leads to the recognition by the licensee of something that the law does not accept or even, quite to the contrary, forbids. Therefore, enforceability of such a licence becomes questionable, at least if copyright remedies are being invoked.

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238 2.2. SPOT General Supply Conditions, *supra* note 228; 2.4. Eurimage licence, *supra* note 230.

239 The situation mirrors practice of ESA to mention all mechanisms that theoretically protect information as applicable to remote sensing data. *See* previous section.

240 Like the US whose legal norms should in theory govern the licences of GeoEye.

"Permitted uses" that are contained in all the licences in the form of a closed list of actions the licensee is allowed to perform with regard to the licensed remote sensing data or information products represent another clause that is potentially incompatible with the copyright or other data and information protection regimes. In general, most of the uses are limited to the licensee's internal purposes.[241] This is, for instance, true for the installation and copying of the licensed products on different computers of the licensee,[242] as well as for the use of imagery contained in the licensed products.[243] Licences permit production and distribution[244] of derivative works, although the terminology used in different licences does not coincide. SPOT Image uses two terms: "Derivative Works" and "Value Added Products" (VAP), the difference being that the latter, despite significant modifications, actually contain the imagery from the licensed data or information, whereas the former are "irreversible and uncoupled from the source imagery data" of the products licensed.[245] GeoEye deploys only one term "Derived Works" that includes both "Derivative Works" and "VAP" of SPOT Image.[246] Eurimage operates with the term "Enhanced Products"[247] and is closer to the definition of the SPOT Image "VAP" rather than the "Derivative Work" (in that it recognises the right of the licensee to distribute without restrictions enhanced products that do not contain licensed imagery).[248] The content of the terms used differs too. For instance,

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241 4(b)(d) GeoEye License, *supra* note 229; 2.1(c)(e) SPOT General Supply Conditions, *supra* note 228; 2.1. Eurimage Licence, *supra* note 230.

242 4(b) GeoEye License, *ibid*.; 2.1 (a)(b)(c) SPOT Standard Licence, *supra* note 228; 1. "Definitions", "Use" (a)(b)(d) Eurimage Licence, *ibid*.

243 4(d) GeoEye License, *ibid*.; 2.1(g)(h) SPOT Standard Licence, *ibid*.; 1. "Definitions", "Use" (c) Eurimage Licence, *ibid*.

244 Limitations apply depending on how processed the licensed data in the derivative product is.

245 Article 1 SPOT Standard Licence, *supra* note 228.

246 4(e) GeoEye Licence, *supra* note.

247 1. "Definitions" of the Eurimage Licence, *supra* note 230, that also provides for alternative names "Derived Products" and "Value Added Products".

248 Any products developed by the User based on the original data contained in the SD/P such as a revision, modification, alteration, development, enhancement, translation, abridgment, condensation, expansion or any other form in which such pre-existing data may be recast, enhanced, transformed or adapted, whether or not by combining or incorporating in such data additional technology, imagery or image processing sufficient to give such data products benefits or features not available in the original data and regardless of whether the value or utility of the data is increased. But *see* 2.2. Eurimage Licence, *supra* note 230: "EP that do not contain any imagery data from the licensed SD/P are not subject to ad-hoc agreements with Eurimage".

SPOT Image Standard Licence[249] states that a digital elevation model or digital terrain model in any form is *always* a VAP containing source data, whereas Eurimage Licence[250] explicitly proclaims the opposite – that a digital elevation model or digital terrain model does *not* contain source imagery. It is hard to imagine, how the user should treat a product he made from the data licensed from both companies.

The right to distribute products that the licensee makes depends on whether they contain imagery from the licensed data. If it is the case, the licensee is not allowed to freely distribute the derivative works produced.[251] Eurimage licence, for instance, stipulates that external distribution of such "enhanced products" requires a prior ad-hoc agreement with it. GeoEye licence states that the distribution of "derivative works" containing pixels of the "source image data" will be dependent on the copyright and licence restrictions of the source data. SPOT Image licence forbids the licensee from distributing directly or indirectly any derivative works on the territory of Canada.[252] Distribution of the derivative works that do not contain imagery from the licensed data is not restricted by any of the licences. If one goes back to the terminology used by the UN Remote Sensing Principles, the derivative works should be regarded as either processed data or analysed information and therefore will most likely fall under the copyright protection. But following the terminology the licences use it is hard to understand, which products would be considered derivative and which not.

Apart from the confusion as to the true meaning of the terms, or the necessity to be always aware of the fact that they may have different meanings within licences of different companies, this situation may lead to misinterpretation of copyright regulations. Differing interpretations of derivative works by the licensors in practice means that they take over a task that the legislators themselves do not dare or do no

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249 Article 1, *supra* note 228.

250 Para 2.2, *supra* note 230.

251 2.1(e) SPOT General Supply Conditions, *supra* note 228; 2.2. Eurimage Licence, *ibid*.; 4(e) GeoEye License, *supra* note 229.

252 2.1(i) SPOT General Supply Conditions, *ibid*.

find necessary to administer – determine where the threshold of creativity leading to copyright protection lies. Legitimacy of such acts is in the very least questionable.

Most of the licences authorise the production of derivative works from the licensed remote sensing data and information, but at the same time prohibit the licensee from disseminating them to third parties. Such a clause may be incompatible with the current legislation regarding copyright protection, provided that the licensee creates his own products eligible for protection. According to the copyright rules,[253] derivative works are subject to copyright protection that is independent from the copyright on the original work provided that the authorisation to make derivative works was granted.[254] A derivative work, being an author's own creation, is always based on one or more pre-existing works, and may be created through different acts, such as translation, arrangement, reproduction or any other form in which a work may be transformed or adapted. Most of the information products based on the licensed remote sensing data and information will qualify as derivative works. This, at least in theory grants the licensee with the right of distribution independent from that of the licensor. But if this only happens in theory and is prohibited in practice by restrictive licence conditions, the value-adding activities, normally pursued by any licensee, become pointless.

[253] E.g. according to §§ 31-42 German Copyright Law, *supra* note 80, sections 90-96 UK Copyright Act, *supra* note 65.

[254] *See* e.g. definition of the "adaptation" in Section 20 UK Copyright Act, *ibid*.; of the "Bearbeitungen" in § 23 German Copyright Law, *ibid*.; as well as of the "derivative work" in § 101, 103 US Copyright Act, *supra* note 80 (note that there are differences in approaches to the definition in the jurisdictions cited).

Table 1. Comparison of the most important licensing clauses regarding distribution of remote sensing data on commercial basis

Company Licence clauses	SPOT Image	Eurimage	GeoEye
Type	Limited, non-exclusive, non transferable	*Sine die*, non-transferable and nonexclusive licence	Non-transferable, non-exclusive use of the data
Ownership	The licensed data remains property of SPOT and are provided on the confidential basis	Eurimage or satellite/ground station operators retain all IPRs. Licensed data are trade secrets	Exclusive ownership of GeoEye and its licensors of the data and their copies
Definitions	Product – the SPOT satellite product Derivative products – any derivative product or information developed by the end-user not containing imagery data from the product and is irreversible and uncoupled from it VAP – any product developed by the end-user, which contains imagery data from the product, and is the result of its significant modification through technical manipulations or addition of other data. Any Digital Elevation Model or Digital Terrain Model always is a VAP	Enhanced Products – any products developed by the user from the original licensed data (e.g. revision, modification, alteration, enhancement, etc.) that have benefits or features not available in the original data, regardless of whether the value or utility of the data is increased EP containing source imagery – Fused Imagery Products, Orthorectified Products, Enhanced Image Products, Analogue Products EP not containing source imagery – derived Vector Map Products, Derived Digital Elevation Model or Digital Terrain Model Products, Text/Tabular Products	Derived works without source imagery, e.g. vector extraction, classification

Company Licence clauses	SPOT Image	Eurimage	GeoEye
Company **Licence clauses**	**SPOT Image**	**Eurimage**	**GeoEye**
Permitted Uses	<u>Uses for internal purposes</u>: to install, make back-up copies; To produce, use VAPs, or make them available to contractors or consultants <u>External uses</u>: to post on an internet site (without downloading option, with notification of the URL to SPOT Image) or distribute printed copies for promotion purposes one extract, maximum size 1024 x 1024 pixels, of any Product or VAP, with © notice; to freely use and distribute derivative works (except in Canada).	<u>Uses for internal purposes</u>: to merge the data in machine readable form and to make a back-up copy; to print imagery out of the data; to store the whole or any part of the data; to develop EP. <u>External use with prior authorisation</u>: to disseminate EP containing any licensed data; to sell to any third party the original SD/P together with the EP. <u>Unrestricted uses</u> – dissemination of EP not containing any licensed imagery data.	<u>Uses for internal purposes</u>: to reformat the data and make hard- and softcopies; to modify the imagery data and make their copies; to make the data available to consultants, agents and subcontractors without the right to transfer, modify, copy or sublicense. <u>External uses</u>: to distribute the data (with © notice) on an isolated, non-commercial basis; to distribute reduced resolution data sets (RRDS) with ratios of 16:1 or higher (with © notice); to distribute derivative works not containing the source imagery without restrictions.
Prohibited Uses	To do anything not expressly authorized To alter or remove any © notice	To use the licensed data in any manner or for any purpose not expressly authorised.	To do anything not expressly permitted in the licence, including any transfer to any third party To alter/remove any © notice or proprietary legend

ii. Current licensing regime impedes use and distribution of remote sensing data

From the perspective of remote sensing data generators and information producers, a licence is a preferable way to transfer their products to users, as it is an effective tool to protect the actual content of the products licensed.[255] Moreover, as shown in the previous section, the licences contain very precise allowed or prohibited modes of data alteration and further use and in fact enable the licensor to control every step of the processes and applications that the data and information are used for by the licensee. Licences can also play an important role in "equalling" the level of protection of remote sensing data and information in different jurisdictions: for instance, they can provide for clauses that will bring the protection of databases containing remote sensing data and produced outside Europe closer to the European *sui generis* database right.[256] Licensing conditions restricting access to a single application or a specific purpose are common in many projects.

The downside of the licensing mechanism is that it does not provide the data generators with effective remedies against third parties who may acquire the same data and information from independent sources and are not therefore bound by the licence. The problem of enforceability of the rights in data and of the control over the contents of the remote sensing data and information becomes more acute in cases where the licences modify the substantive intellectual property law. In a public (access and accountability) dimension licensing data as trade secrets means that rights and obligations are privately negotiated, which goes against the normal approach to intellectual property protection, whereby the rightholders only enjoy the rights that the law explicitly grants them with. Moreover, rights created in such a way "become subject

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255 Onsrud, H.J. & Lopez, X. "Intellectual Property Rights", *supra* note 67.

256 *See* e.g. Longhorn, R. A., Henson-Apollonio, V. & White, J. W. "Legal Issues in Use of Spatial Data and Tools for Agriculture and Natural Resource Management" (Mexico, D.F. 2002). Online: <http://csi.cgiar.org/download/IPR_Primer.pdf> (last accessed 01.02.2011) [Longorn, R.A. *et al.*].

to private ordering and are hard to understand particularly when there are multiple overlapping licences."[257]

Retaining by the generators of remote sensing data of the ownership over the copies of licensed remote sensing data, together with the authorisation of their permitted uses and conditions of further dissemination also go against basic provisions of copyright regulations.[258] General prohibition of further distribution and dissemination even of the data processed or otherwise altered by the licensee[259] expands the scope of the licence beyond the scope of copyright protection. This is a major difference between private licensing practice from the governmental policies that at the very least allow dissemination of the newly created data and information products for non-commercial purposes. Private entities, although using copyright to reinforce and legitimise their freedom to determine the ways licensed data may be used, forget that sharing is enabled by the exceptions to the rights of authors that are granted by law alongside those rights and have to be respected as part of the copyright protection regime. Most significantly, it represents excessive commodification of remote sensing data and information, as it does not sufficiently take into account interests of their users.

The adopted restrictive approach to ownership and rights vested in remote sensing data prevents them from wider dissemination and free-flow, and thereby changes patterns of behaviour of at least some types of data users, such as researchers and research organisations, who are no longer in the position to properly share the data.[260] Except for the US government, both public authorities in Europe and private generators of remote sensing data claim copyright on the results of their activities and hence do not classify data they possess as a public good, but rather as a very expensive commodity that in

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[257] From comments to the research by Prof. Tina Piper [original on file with the author].

[258] *See* Harris, R. & Browning, R. *Global Monitoring: the Challenges of Access to Data* (UCL Press, 2005), chapter 4.

[259] With the exception to dissiminate the altered data do not containing pixels of the licensed data and information.

[260] The problem of licensing is mentioned as hindering dissemination and use of the remote sensing plan in the US Commercial Remote Sensing Space Policy: Civil Agency Implementation Plan, *supra* note 216, at 32.

addition to all other layers of protection has to be provided to others on the confidential basis. In Europe, as was shown in this chapter, the content protection is not only provided for in the licences, but also through the *sui generis* database right. All these practices, accompanied with circumvention restrictions and technological protection measures, affect accessibility of remote sensing data and information[261] and reduce potential benefits that can be derived from their use.[262]

4. IPR protection regime is incomplete without sharing

a. Creativity relies on availability of information and works

In the contemporary world it is hard to come up with something entirely new, especially with regard to intellectual creations, such as various information products, gene patents or databases that do not fit well into the traditional copyright or other intellectual property protection framework. To make new assets their authors have to turn to existing technologies, experience or works, as well as to data and information, which today can be considered "the currency of creativity and innovation."[263] According to the classical interpretation of copyright provisions, the protection of an intangible object that contains certain ideas may not cover them: these ideas are subject to unconventional sharing. Furthermore, for the creation of some works like

[261] "Summary of Presentations" (Panel on Universal Access to Information and Informatics for Human Development UNESCO/ECOSOC, May 10, 2000). Online: <http://infolac.ucol.mx/observatorio/universal.pdf> (last accessed 01.02.2011).

[262] For instance, the benefits for the US economy from the data generated by the Landsat satellites at least in the 1980s were estimated at US$10 billion per year. *See* "Operational Remote Sensing Satellites" US Centennial of Flight Commission. Online: <http://www.centennialofflight.gov/essay/SPACEFLIGHT/remote_sensing/SP36.htm> (last accessed 01.02.2011).

[263] Cutler, T. "Innovation and Open Access to Public Sector Information" in Fitzgerald, B. ed., *Legal Framework for e-Research: Realising the Potential* (Sydney: Sydney University Press, 2008) at 25.

scientific works and publications the use of factual information is essential. These two basic premises form an essential part of the copyright protection regime.

Facts always remain in the public domain, but even the protected works cannot be prevented from being inspirational or useful for creating new works of authorship. Moreover, all the works inevitably fall into the public domain after the term of copyright protection expires. That is why traditionally factual data and information have been excluded from the realm of copyright protection: they were never created, but rather discovered, and therefore had more value as raw material for the actual creation of other works, rather than worthy of protection by themselves. This process of creating new intellectual property assets brings all works close to the commons, as each and every one of them may be used to produce new works of authorship.

The production of useful information and knowledge out of primary or processed remote sensing data is highly dependent on previous knowledge and access to it. Generation of geographic information products requires experience and skills in such areas as computer science, geography, geology, climatology and many others, depending on the needs of end-users. Therefore, reference to works previously created or data, regardless their eligibility for copyright protection, is inevitable to make such products. Remote sensing data constitute a building block for a number of geographic information products, and the most value can be extracted from them only if they are used in combination with data and information from other sources and are processed up to the level required to meet needs of various users.[264] Moreover, since primary remote sensing data are essentially facts, as they describe geographical reality, access to them must be secured in order to make the important value-adding activities possible.

[264] With regard to the complexity of the process of determining value of geographic information in general *see* Longhorn, R. "Valuing the Invaluable – a Geoinformation Conundrum" (Paper presented at the Value of Geoinformation Workshop, Hamburg, September 30 – October 2, 2010). Online: <http://digimap.hcu-hamburg.de/geovalue/tl_files/presentations2010/Keynote%20Roger%20Longhorn.pdf> (last visited 01.02.2011).

A number of authors, therefore, rely on the existence and enrichment of the so-called "information commons", which allows the development and exchange of ideas[265] and at least for this reason has to be protected from erosion.[266] The need or desire to use previous works to create new ones is not that of authors alone. The creative process is built upon the principle of the free flow of ideas that is recognised by all of the major instruments of intellectual property law.[267] Legislators agree that there cannot be copyright over ideas. In confirmation of such interpretation, paragraph 24 of the German Copyright Law, for instance, allows "free use" of works to create other works of authorship. Furthermore, it does not impose the obligation to get permission from the copyright owner of the used work to make the new work available to the public or use it otherwise. Despite the recent developments in copyright laws that make them more all-encompassing, by granting more rights and infringement control mechanisms to rightholders, existing copyright protection regulations do not abolish the foundational principle of the free flow of ideas. This means, for both authors and users that this principle still remains the cornerstone of the copyright protection regime. It is as important as the rights of authors themselves and is indeed an integral part of relations between rightholders and users of protected works. This status quo leads to the requirement for a framework of protection of remote sensing data to guarantee as wide and unrestricted access to the existing works as possible, provided that copyright is applicable to data products in the first place. Such an approach can facilitate the creation of new works and is in fact reflected in the copyright laws and regulations across the globe.

The existence and necessity of the commons to encompass remote sensing data and information is also dictated by another element of the traditional intellectual property regulatory framework: inevitable transfer of protected works into the public domain.

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[265] Lessig, L. "Reclaiming a Commons" (Paper presented at the Berkman Centre Conference on Building a Digital Commons, Harvard University, Cambridge, May, 1999).

[266] Benkler, Y. "Free as the Air to Common Use: First Amendment Constraints on Enclosure of the Public Domain" (1999) 74 *NYU L. Rev.* 354.

[267] *E.g.* the Berne Convention, *supra* note 17, WIPO Copyright Treaty, *supra* note 17; national law *e.g.* §102 US Copyright Act; §69a(2) German Copyright Law, *supra* note 80.

This is the manifestation of the limited-in-time and –in-scope nature of copyright and other forms of intellectual property protection – two features that enable others to use works protected by intellectual property laws and regulations.

b. Indispensability of access for distribution and use of remote sensing data

The notion of the commons (and not even that of the public domain, which for the author is much more related to works that in fact fall under the copyright protection) supports the argument in favour of the recognition of the right to access remote sensing data, the need for which is stipulated by their technical and applied nature. Remote sensing data describe the Earth and phenomena related to it, and are used to reach, among others, such goals as sustainable use of resources, preservation of rare habitats and forests, and understanding and slowing down the process of climate change. Data required for these applications reflect the world as it is, and are used for the common good of all living organisms on this planet. Not only environmental applications of remote sensing data serve this purpose: the data are needed to make geo-political decisions, and other types of decisions regarding development, including urban planning or the search for potential places to produce energy from alternative sources like wind or water. This requires broad access to the data in order to conduct their analyses for these different application purposes. But instead of such an effective commons, a number of policies and laws that restrict access to remote sensing data and information are adopted across the world, as shown in the previous sections of this chapter. They are a result of lobbying efforts by the information generators and providers whose only interests are profit-making and the ability to retain power in the information society.[268]

[268] Practice that drove the adoption of the WIPO Copyright Treaty, as well as of the EU Database Directive, for which the space sector was one of the major lobbyists (personal interview with M. Ferrazzani, ESA).

In the long run such practices distort the balance between interests of authors and users of copyright works that traditional copyright protection regime creates and maintains.

Taking into account importance of remote sensing data for generation of useful information and knowledge, as well as the necessity to use knowledge from other fields to be successful in it, it is logical to follow the strategy chosen by the US and place at least the primary remote sensing data in the realm of commons accessible to all who need them. Therefore, the right of users to access information in general and remote sensing data in particular should be introduced, or rather, recognised and reinforced. The right of access would not deny the legitimate protection that data and information may enjoy, but will create a fair playing field for different actors.

The right to access remote sensing data on the one hand supports, and on the other is complemented by the public good characteristics or dimension of remote sensing data. The next chapter deals with this aspect of remote sensing data in order to substantiate the argument in favour of establishment of the principle of sharing based on the theory of the common good as indispensible for the effective legal framework of generation, use and distribution of remote sensing data – the argument central to this research and to the success of remote sensing activities.

5. Conclusions

Copyright, other forms of intellectual property protection, government data policy guidelines, and private licences are used to protect remote sensing data, although the legitimacy of their applicability at the very least to primary remote sensing data is not always clear or convincing. The methods of data generation, as well as their other inherent characteristics do not allow them to meet the requirement of creativity in order to be protected by copyright. The European *sui generis* database protection, although potentially applicable to databases containing remote sensing data and actually very handy (from the perspective of the remote sensing data generation), is too

broad and vague on the one hand, and strictly regional on the other, to be truly beneficial for remote sensing database makers.

The data policies adopted within the US and in Europe[269] incorporate an almost opposite standing with regard to the status of government-produced data and information, including remote sensing data, and set up different relationship patterns with the private remote sensing industry. Very often these policies only deal with the state- or budget-generated remote sensing data and therefore do not have enough influence on shaping licensing schemes that private generators of remote sensing data adopt and utilise.[270] The private licensing mechanisms are very restrictive and based on the principle "everything that is not permitted is forbidden". They permit production of derivative works that in most cases qualify for copyright protection, but restrict their distribution to third parties through a set of conditions, the most important of which is the degree of processing.[271]

While the European strategy of a more stringent protection of remote sensing data seems to be problematic, the US approach of less protection at least for government-generated and primary remote sensing data proved to be effective. Primary remote sensing data are a building block of further geographic information and new knowledge embodied in new works made by the value-adding industry players, who depend on access to them.[272] The data in natural sciences, including remote sensing data, are often unique, non-reproducible and available only from a sole source.[273] These circumstances indicate the necessity to ensure free and unrestricted flow of data that can satisfy the

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269 Both ESA and the European nation states.

270 This is particularly pertinent for the European states and ESA, since the US has at least some measures that balance out restrictive private licences through their "mediator" role in purchasing privately generated remote sensing data and in offering it to the members of the society at large through its archives.

271 Which is again a practical proof of the realisation that the (processing) differences among different types of remote sensing data need to be reflected in the modes and methods of their protection.

272 From: Onsrud, H.J. and X. Lopez, "Intellectual Property Rights, *supra* note 67.

273 "Bits of Power" Committee on Issues in the Transborder Flow of Scientific Data *et al.* report (Washington, D.C.: National Academy Press, 1997). Online: <http://www.nap.edu/readingroom/books/BitsOfPower/index.html> (last accessed 01.02.2011) [Bits of Power].

needs of their users.[274] Therefore, the US example of obligating even the private generators of remote sensing data to make their primary data available for the US-wide archiving within a reasonable amount of time is more adequate than the European property-oriented approach. It allows the expansion of public domain on the one hand, and encourages development of the private activities in the field of remote sensing and geographic information on the other.

Information, once communicated, becomes a distinct intangible asset whose use by third parties cannot be banned by its original owner. That is why it is quite easy to place information into the realm of the public domain, which is a manifestation of the concept of the common property for intangible assets. The issue to consider is "whether there are property-specific justice reasons sufficient to warrant the creation of artificial scarcity ... by the enactment of specialised trespassory rules".[275] And it seems that there are alternatives to a strong property-like regime with regard to the treatment of remote sensing data. One practical manifestation of such an alternative is the legal framework for access to public sector information, including publicly generated remote sensing data. It grants users of government-generated information the right to access it and is more generous with regard to the use-rights. This option is introduced in the next chapter and is followed by its philosophical underpinning – the theories of the common property and the common good, history of which goes back to Aristotle. The purpose of this analysis is to provide for the reasoning other than the current intellectual property protection expansion motto "more protection – more development",[276] as well as to support its viability by examples from today's legal and factual reality.

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[274] WIPO, Documents of the Information Meeting on Intellectual Property in Databases: "World Meteorological Organisation observations" DB/IM/4 (September 4, 1997). Online: <http://www.wipo.int/documents/en/meetings/infdat97/db_im_5.htm>; and "UNESCO observations" DB/IM/5 (September 15, 1997). Online: <http://www.wipo.int/documents/en/meetings/infdat97/pdf/db_im_4.pdf> last accessed 01.02.2011).

[275] Harris, J.W. *Property and Justice* (Oxford: Clarendon Press, 1996) at 342.

[276] Adopted within the European Union and taken as the key feature of the harmonisation of intellectual property regulations in the EU and the Member States.

A balanced approach to the regulation of access to, distribution and use of remote sensing data is very important. Its aim should not be the protection of data generators and distributors alone, but also recognition of legitimate users' interests, as information requires an audience to become knowledge that is usable and useful. Whereas today there is a clash between the nature of information that presupposes a broad access to it and the dominance of the commodification philosophy[277] that creates restrictive access policies at least in some countries or within the industry. Policies and regulations that restrict access to data are inappropriate because remote sensing data and many of their applications have global implications, and are utilised for the common good.

[277] For the notion that governments support commercial interests of IPRs owners *see e.g.* in Stienstra, D., Watzke, J. & Birch G.E. A "Three-way Dance: The Global Public Good and Accessibility in Information Technologies" (2007)23 *The Info. Soc.* 149 [Stienstra, D. *et al*.].

Chapter 3: Right to access public sector information

Application of the copyright protection regime to remote sensing data is either impossible or involves complications driven by the technical and factual nature of the primary remote sensing data, by the automated procedure of a lot of stages of data processing that points to the lack of creativity, or by the desire of the data generators to control use of their content through restrictive licensing practices. In addition, the different approaches to the regulation of the status of and access to remote sensing data and the resulting inconsistencies in the legal norms in the US and Europe may complicate international distribution and use of remote sensing data. Particularly, the European attempt to commodify information, including remote sensing data, invites to contemplate whether this is the right strategy to treat them as building blocks of knowledge in the information society, the usefulness of which lies in their actual use.

This chapter seeks to analyse another regime of protection of, access to and use of remote sensing data and information – the legal framework of treating public sector information that is generated by governments or on their behalf. This legal regime is highly relevant to the issue, because access to remote sensing data, as well as to geographic information in general, happens in a wider context of access to and sharing of public sector information, which becomes more and more important as the information economy grows and develops.[278] The legitimacy of the applicability of the regime is in the first place explained by the fact that the biggest amount of remote sensing data is produced with at least some kind of involvement of governmental support: governments either develop and launch satellites themselves,[279] or fund

[278] Janssen, K. &Dumortier, J. "Towards a European Framework for the Re-Use of Public Sector Information: a Long and Winding Road" (2003) 11 *Int'l J.L. & Info. Tech.* at 184.

[279] For instance through the budget approval of a certain RS satellite or system project. *See* Brazil-China CBERS project as an example. Online: <http://www.cbers.inpe.br/en/index_en.htm> (last accessed 01.02.2011).

programmes that involve launch of remote sensing satellites by non-governmental actors.[280]

The field of law that establishes the regime of public sector information is complex. Definitions and the content of the most of the categories it is based on and operates with – public sector information, conditions of access, modes of funding – result from lengthy political negotiations.[281] Despite the fact that this type of information is produced by public bodies while or because of carrying out their primary activities, reconciliation of the interests of the governments, citizens and the private information re-users is not an easy task. Creation of an information commons from the bulk of public sector information requires the consensus and cooperation of all stakeholders. Notwithstanding the difficulties, the main value of the regime is in its underlining principle – that of the *right* of the citizens to access public sector information and use it with as few restrictions imposed as possible. The analysis in this chapter aims at bringing forward the arguments to support the viability of the regime of access to public sector information, as well as at pointing out its features that allow it to be considered a workable alternative to the copyright and other intellectual property protection regimes as applied to remote sensing data and information.

To achieve this, the analysis of what a public good is and of whether data and information in general and remote sensing data in particular can be categorised as such is undertaken. An overview of the regime regarding public sector information based on the jurisdictional examples of the US and the EU[282] is then provided. The analysis of the relevant legal norms only includes the basic notions and the principles of sharing with some examples of specific treatment of the geographic information. Finally, the relevance of these regulations for the dissemination of remote sensing data is discussed

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[280] Like in the case of the Canadian Radarsat-2. *See* information about the satellite online: <http://www.radarsat2.info/> (last accessed 01.02.2011).

[281] Craglia, M. & Blakemore, M., *supra* note 62.

[282] Alongside the regulations and directives of the European Union, the relevant legislation of Germany and the UK is used to highlight possible differences of the national regulatory framework when compared to the harmonised European regime.

with the aim of assessing to what extent the norms establishing the right to access public sector information should be extrapolated on to remote sensing data and information. This exercise should provide information and a groundwork for the discussion regarding the links between public sector information and the regime of access to it, as well as the issue of its protection by virtue of intellectual property rights. The analysis furthermore brings forward the connecting philosophical ideas that can reconcile the current regulations both in the sphere of intellectual property protection and access to public sector information. The reason for this is that despite the similarities in the protected subject-matter, some of the principles underlying each regime differ greatly, this particularly being the case in the US. As a result, simultaneous or parallel application of these differing regimes to the same data should be avoided. The connection between the regime of access to and use of public sector information with the philosophical ideas that support sharing based on the theories of the common good and common property and their influence on the content of private property rights, is used to argue in favour of its effectiveness.

1. Public good nature of remote sensing data and information

The concept of public good has frequently been applied to intellectual property assets in general and copyrighted works in particular,[283] because some of their distinct characteristics reflect its features – non-rivalry and non-excludability. Firstly, it is virtually impossible for the author to control the use of the sold copies of his work. Secondly, the amount of money and time spent to create a work of authorship does not depend on the number of people who in the end will be its consumers. These particularities of a public good are discussed in the following sections in greater detail. The notion of public good is important in the context of access to public sector information, as declaring certain types of information as public goods is the first step in

[283] It is not the aim of this research to assess whether all copyrighted works should be considered a public good or not.

recognising the right and the need of the society and its member to be provided with them. The analysis of the concept of public good helps to better understand the principles of the regime of access to and use of public sector information in general and remote sensing data in particular.

a. Characteristics of a public good

Public goods are traditionally characterised by two main features: non-rivalry and non-excludability. When a good is non-rival the cost of providing it does not depend directly on the number of consumers who benefit from it. The non-excludability means that it is not feasible to exclude those who do not pay for production of public goods from the benefits from their use.[284] These features of public goods often reduce the likelihood of their commercial production or distribution, and as a result both processes are conventionally attributed to government institutions.[285] It is the matter for the society and subsequently for the legislator to decide whether and which goods should be recognised as public.[286] This process is usually accomplished in three stages.[287] Firstly, the actual choice of public goods and the amount of funds to be spent on them is made. Secondly, the decision as to the accessibility of public goods and their inclusion in the public domain is agreed upon. Lastly, the actual production of the goods by either public or private entities is initiated.

It is worth taking into account that by and large most public goods are not necessarily "good" themselves. They are promoted and gain this status if the society decides that they contribute to economic growth and people's well-being and thereby serve the achievement of the common good. Some goods are public because their very goodness

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[284] *See e.g.* Samuelson, P.A. "The Pure Theory of Public Expenditure" (1954) 36:4 *Rev. Econ.& Stat.* at 387-389.

[285] Desai, M. "Public Goods: A Historical Perspective" in Kaul, I., Grundberg, I. & Stern, M. eds. *Providing Global Public Goods: Managing Globalisation* (New York: Oxford University Press, 2003) at 63.

[286] *See* Hampsher-Monk, I. "The individualist Premise and Political Community" in King, P. *Socialism and the Common Good: New Fabian Essays* (London: Frank Cass, 1996), in particular at 215.

[287] Desai, M., *supra* note 285.

consists in their ability of being jointly consumed or enjoyed.[288] The choice behind declaring one good or another as public is often driven by various private interests and rights of citizens,[289] taking into account the prospects of a good to satisfy and strengthen them if the decision is made in favour of its provision. Therefore, their value for the economy and society incorporates the assessment of their impact on the overall societal development and the benefits it brings, and cannot depend solely on the expenditure for their production and distribution.[290] Some of the characteristics of remote sensing data and information as described in chapter 1 speak in favour of their inclusion in the category of public goods.

Along with classic public goods that continue to exist for centuries (waterways, coastal lines, lighthouses, air, etc.) there are new types of public goods that have started to emerge only recently. They do not necessarily meet the traditional criteria of the "public good" category. Instead, due to their characteristics and usefulness for a society, their status as a public good is substantiated by the public will to recognise them as such.[291]

The concept of the public good is being reshaped, with more facets being added to its nature. Some scholars argue now that public goods can actually be excludable and rivalrous,[292] and that "publicness and privateness are social constructs," and depend, therefore, on the assessment by the society of their importance with regard to the common good and its achievement.[293] This process is not governed by economic factors alone, but involves a wide range of other issues that determine how to "define, assign,

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288 Miller, D. "Market Neutrality and the Failure of Cooperatives" (1981) 11 *British J. Pol. Sc.* at 326-327.

289 *See* Schlatter, R. *Private Property: The History of an Idea* (London: George Allen & Unwin Ltd, 1951) at 170, citing Blackstone's reasoning of why private and common ownership can co-exist and are not mutually exclusive.

290 Kaul, I.K. & Mendoza, R. "Advancing the Concept of Public Goods" in Kaul, I., Grundberg, I. & Stern, M. eds. *Providing Global Public Goods: Managing Globalization* (New York: Oxford University Press, 2003) at 94.

291 Kaul, I.K. & Mendoza, R., *ibid*., at 84.

292 Desai, M., *supra* note 285, at 72.

293 Kaul, I.K. & Mendoza, R., *supra* note 290, at 81. It is worth noting here that pure or traditional economic analysis of public good will be opposed to such interpretation that essentially stretches the concept.

and monitor private property rights, update and revise them as needed, enforce them, and settle disputes"[294] after the choices with regard to what assets to declare as public goods are made.

Some of today's public goods, like for instance information, are complex and comprised of different building blocks.[295] Remote sensing data constitute one of the building blocks of geographic information. The complexity of some public goods results in the necessity for both public and private actors to participate in their production, provision and management.[296] Involvement of private players in the production of such goods should not automatically exclude them from the category of public goods. On the contrary, development of public goods can and should be fostered by private actors themselves, as in the long run this will help them to attain benefits that are not feasible to achieve through public initiative only.

The process of globalisation adds another dimension to the discourse as to what is a public good, as this development poses a question of who is going to be responsible for providing public goods whose benefits could be consumed by everyone in the world.[297] New information and communication technologies shape people's access to information, modes of their work, and even change their private lives by making the connection with the world faster and easier.[298] This trend makes the decision as to whether information, including remote sensing data, should be considered a public

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294 *Ibid*., at 86.

295 *Ibid*., at 101: "Most global public goods follow a complex, multidimensional, multi-layered, multi-actor production path. Accordingly, many are also likely to comprise a variety of building blocks. These building blocks can include national public goods, which may require harmonization or upgrading for all to enjoy a higher level of provision."

296 For a detail analysis of the public-private partnerships in generation, processing, distribution and use of remote sensing data *see* section 3 of the next chapter.

297 So-called "global public goods" include scientific knowledge. *See* "Meeting global challenges: International cooperation in the national interest" International Task Force on Global Public Goods final report (Stockholm, 2006) at viii. Online: <http://www.gpgtaskforce.org/uploads/files/169.pdf> (last accessed 01.02.2011) [Meeting Global Challenges].

298 *See* the discussion of the development of the information age in Castells, M. *The Rise of the Network Society*, 2nd edn (Oxford: Blackwell Publishing, 2000) at 5-6.

good, more pertinent. The foundations for such a possibility are explored in the next section.

b. Application to remote sensing data and information

Information by its nature is an intangible object, as its value is independent from the source of its fixation, if any. Due to this intangibility it does not attract classic proprietary rights; therefore the level of protection given to it is sometimes extremely thin.[299] The term "information" itself, which includes at least the communication of facts, news, knowledge and scientific information, suggests that it cannot be "frozen" on a certain medium or considered as an object in exclusive ownership of a single person or entity, as it has to flow.[300] According to the theory of incomplete capture,[301] which reflects this particular nature of information, even highly protected information cannot be fully controlled by its owner. In addition to these factors, there is another reason to consider information a public good:[302] the cost of providing it does not increase with consumption and it is generally not possible to exclude those who do not pay for its production from its consumption.[303] It is non-rivalrous and non-excludable as are other, conventional public goods.

Some authors argue that even information technology that is used as a tool to transmit information for various purposes, is a public good, due to the fact that it may contribute to the societal well-being and "transform the interaction between and among various

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299 Fisch Nigri, D. "Theft and the Concept of Property in the Information Age" in Harris, J.W. ed., *Property Problems from Genes to Pension Funds* (London, Boston: Kluwer Law International Ltd, 1997) at 48.

300 This feature of information brings it closer to such traditional public good as waterway. The metaphor of information as a waterway is developed in detail in the last chapter of this research.

301 Wagner, R.P. "Information Wants to Be Free" (2003) 103 *Colum. Law. Rev*. at 999.

302 *Ibid*., at 1001 note 20.

303 Kieff, F.S. "Property Rights and Property Rules for Commercializing Inventions" (2001) 85 *Minn. Law Rev.* 699, note 4.

stakeholders in society, transcending geographical and other boundaries."[304] And if technology, being a tool, is recognised as a public good, how the information that is the content it transmits should be treated, if not as a public good as well?

Bearing in mind that remote sensing data constitute a building block of information,[305] the first thing to highlight is that they also meet both non-rivalry and non-excludability criteria, as their generation costs do not necessarily correlate to the number of those using them and benefiting from them.[306] Actors not engaged cost-wise in their generation and use cannot be excluded from the benefits of their application, especially where data and information are, for example, used for various public purposes such as climate change research, urban planning and population research,[307] sustainable agriculture, environmentally safe oil drilling,[308] etc. All these applications are not only directly beneficial to those who actually use remote sensing data, but also indirectly beneficial – to the society at large, as it benefits from the achieved sustainable results, for instance, cleaner environment.

Although it was mentioned earlier that the status of a good as public should not depend on whether the source of its production is public or private, in practice, private involvement in the generation or distribution of remote sensing data may make the process of recognising them as a public good more problematic.[309] The issues mostly are of an economic nature, as remote sensing data, like other types of geographic

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304 *See* Paua, F. "Global diffusion of ICT: A progress report" in Dutta, S. e*t al.* eds*. The Global Information Technology Report 2003–2004: Towards an Equitable Information Society* (New York: Oxford University Press, 2004) at 23–54.

305 At least of geographic information.

306 *See e.g.* Stallkamp, L.E. "Remote Sensing Data as a Public Good" (2000) *Rem. Sens. Law & Pol.* at 575 note 7.

307 Application of Remote Sensing Satellite Data in the Study of Urban Population-Environment Interactions (May 2010). Online: <http://www.populationenvironmentresearch.org/papers/Rahman_Netzband_PERN_statement.pdf>. For more details *see* the materials of the relevant seminar online: <http://www.populationenvironmentresearch.org/seminars.jsp> (last accessed 01.02.2011).

308 "Satellite Remote-Sensing Data and Imagery for Oil and Gas Exploration" Geoimage. Online: <http://www.offshore-technology.com/contractors/communications/geoimage/> (last accessed 01.02.2011).

309 These complications were addressed in chapter 2 regarding protection of remote sensing data: copyright, other protection regimes and licensing.

information, are expensive to generate but easy to copy. The heart of these complications is the necessity to make the choice between the revenue-maximising strategy for the generators of data and increase of benefits to the society from their use.[310] Nevertheless, the ideal scenario of the application of the concept of public good to remote sensing data would not be affected by the source of their generation. What may be of greater importance when addressing the status of privately generated remote sensing data, is whether they should be treated as a public good only when used for particular applications that have a public vocation. For example, they should be treated as a public good if and only if used for environmental or other comparable purposes. Another option is to recognise remote sensing data as a public good embracing or not withstanding all of their possible applications and uses.

Remote sensing data gained through state funding are or should be treated as an information public good.[311] The first reason is, of course, the source of funding for their generation: financed by taxpayers, they should be used for the public benefit and not sold to the users at market prices, as it is often done, for instance, by the UK mapping agency Ordnance Survey. Another reason behind this proposition is that remote sensing data and information can be and are widely used to support sustainable development and other communitarian goals: examples of clean environment, health, knowledge, enforcement of property rights, peace and security have already been mentioned. All of them demonstrate instances of a public good that may well become global in the near future.[312] It should be noted that the beneficial character of remote sensing data does not depend on whether they were generated by the state or private companies. This is one of the reasons why the nature of the source of data generation should not be the

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310 Craglia, M. *et al.* "Lessons Learned" in *GI in the Wider Europe. GINIE: Geographic Information Network in Europe* (January 2004) Online: <http://www.ec-gis.org/ginie/doc/ginie_book.pdf> (last accessed 01.02.2011) at 237.

311 As for instance in the US.

312 More information online: <http://www.globalpolicy.org/socecon/gpg/index.htm> (last accessed 01.02.2011).

only decisive factor in setting up legal regime regarding their status, distribution and use.[313]

Another argument in favour of the recognition of remote sensing data as a public good is that their use has a twofold purpose: firstly, to identify and study the issues, and secondly, to attract attention to them. Alongside their accessibility for the purpose of carrying out research, which in itself is an important driver of opening up information, the data should be available to raise awareness about the issues that are object of such research. The application of the concept of public good would suit this situation best. This argument is supported, for example, by a study performed by German researchers, the main result of which is the finding that the availability of expert information about climate can enhance the altruistic motivation of the general public to properly address global climate change.[314] This availability can be guaranteed if relevant policies and laws grant scientific information the status of public good, which remote sensing data potentially are.[315]

The beneficial character of remote sensing data and information entails in them or in the very least brings them very close to the status of the public good. The public interest in obtaining information may prevent remote sensing data and information producers and owners from foreclosing access to them. It is important to note that the concept of public good is already common in many organisations that provide environmental data.[316] Once recognised as a public good, data and information are treated in accordance with the public sector information or freedom of information legal regimes. Their viability for handling remote sensing data and information, as opposed to the more proprietary and often misapplied regime of copyright protection is assessed in the sections below.

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313 Strategy of the analysis that will be conducted later on is sketched in the table in the end of this section.

314 Case study provided in Milinski M. *et al.* at 3996, *supra* note 35.

315 The example is relevant to remote sensing data, as today it is impossible to conduct climate change research without data gathered by remote sensing satellites.

316 *See* Pearce, D. *Blueprint 4, Capturing Global Environmental Value* (London: Earthscan Publications Ltd., 1995) at 3-6.

2. Main characteristics of the public sector information regime

Initially based on the freedom of expression, access to and re-use of public sector information is governed by specific norms incorporated in so-called freedom of information laws (FOIAs). Their provisions lay down conditions of access to information held by the government, its agencies or private entities on their behalf. For the time being, their importance with regard to conditions of access to remote sensing data cannot be overestimated, as the greatest part of primary data are still produced using government funding. For the analysis the following regulations are primarily used: the EU Directive on the re-use of public sector information,[317] the INSPIRE Directive,[318] the German Law regarding the regulation of access to information of the federal government,[319] the UK Freedom of Information Act,[320] and the US Freedom of Information Act.[321] Analysis of the norms these acts contain is carried out to map out the differences between the regime of access to and use of public sector information and the intellectual property protection of information products. In doing so it primarily targets the principle of the right of access to public sector information and its importance for the development of the specific patterns of dissemination and use of this particular type of information.

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317 EC, *the European Parliament and of the Council 2003/98/EC of 17 November 2003* [2003] *OJ L* 345/90-96 [PSI Directive].

318 *Supra* note 29.

319 Short title „Freedom of Information Law" (Informationsfreiheitsgesetz) September 5, 2005. *BGBl*. I S. 2722 [German FOIA].

320 2000, c. 36 [UK FOIA].

321 1996. 5 USC §552 as amended [US FOIA].

a. What information is "public"?

i. Definitions

The regulations regarding public sector information give the word "public" a twofold meaning. In the first place it relates to the information that is produced or controlled by a public body. Secondly, the information so held is associated with the right of the public to access it. At the same time the concept of "public sector information" should not be automatically linked to that of the public domain: it is not the matter of fact that all information held by the public bodies is automatically available to the public. The restrictions on access are addressed a few pages below. This section deals with the concepts of information and the public authority.[322]

The term "public sector information" is not always identified as the subject-matter of so-called freedom of information acts (FOIAs). Instead, notions like information,[323] documents[324] or records[325] held by the public bodies are used. Nevertheless, it is rather the wording than the substance that differs between various jurisdictions. For instance, the European Directive on the re-use of public sector information (the PSI Directive) uses the word "document" defined through "content",[326] the US FOIA operates with "record" defined through "information",[327] and the German FOIA does exactly the opposite: uses "record" ("Aufzeichnung") to define "information". The UK FOIA is the only regulatory act that does not define what public information is, and leaves the exact subject-matter to be laid down through interpretation of the concepts of the public authority and the request for information, as well as through the system of exemptions that prevents public access to certain types of information. The crucial part of the

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322 Or public body. The terms are interchangeable for the purposes of this research.

323 E.g. UK FOIA, *supra* note 320.

324 *See* e.g. Council of Europe, Recommendation on access to official documents, Rec(2002)2. Online: <http://www.coe.int/T/E/Human_rights/rec(2002)2_eng.pdf> (last accessed 01.02.2011).

325 E.g. U.S. FOIA, *supra* note 321.

326 Article 2(3)(a)(b) PSI Directive, *supra* note 317.

327 § 552(f)(2) US FOIA, *supra* note 321.

definition lays down the principle that such information has to be produced or held by public bodies.

If only using the definitions highlighted above public sector information can be seen as a very broad category. It is obvious though that not all such information can be shared. For the purpose of this chapter the most important notion is that in principle public information should be shared and made available to citizens. Whether the amount of available information is substantial or insufficient, is not of great importance for the present analysis, as it aims to assess whether a system of sharing can exist effectively and be based on some principles common in all jurisdictions. One of such common approaches to reasoning is the acknowledgement that the taxpayers have the right to access information generated by public bodies or on their behalf, since they already contributed to its production – a rule that clearly has some parallels to or its basis in the notion of the common good. Nevertheless, for the sake of a more thorough analysis the restrictions of the scope of public sector information as a regulatory concept are mentioned. These definitional restrictions are twofold and can be categorised by the subject and the object. Restrictions by subject pertain to the body that produces information, whereas restrictions by object exclude certain categories of information from the subject-matter of the FOIAs.

ii. Producers and holders

To understand what information may be regarded as public it is also necessary to determine who can be qualified as the public authorities that produce, hold and disseminate these types of information. This is the stage where the complications start. First of all, there are different strategies to approach the definition of the public authority. The European legislator prefers to list some generic characteristics the presence of which should signify that a body is a public authority. Following this principle the PSI Directive states broadly that the public bodies include “state, regional or local authorities, bodies governed by public law and associations formed by one or

several such authorities, or one or several such bodies governed by public law".[328] This definition may be modified by the Member States. The definition in the German FOIA, for instance, includes federal authorities, as well as other federal organs and institutions as long as they perform public administration tasks.[329] The UK FOIA, alongside a separate list of all public authorities that are bound by it,[330] contains conditions under which any person can be designated as a public authority.[331] The US FOIA definition is most similar to that in the German FOIA but uses the term "agency".[332]

No matter what approach is taken in a regulation, it constitutes a complication, as it requires some interpretation and therefore cannot be absolutely precise and all-inclusive. Even the seemingly straightforward list of the UK FOIA is not clear when interpreted within the EU-context, as it does not explicitly state that the listed authorities also include all possible "public sector bodies" as per PSI Directive. This determination of what entities should be regarded as public authorities can have an important impact on the conditions of access to public sector information is very important though,[333] as the notions of ownership and use go hand in hand with it.

The approaches to the ownership and the permitted uses differ – quite substantially – in the two jurisdictions. The US has state and federal open record laws, with its domestic

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328 Article 2 PSI Directive, *supra* note 317. It's section (2) then goes on to define "body governed by public law": anybody: (a) established for the specific purpose of meeting needs in the general interest, not having an industrial or commercial character; and (b) having legal personality; and (c) financed, for the most part by the State, or regional or local authorities, or other bodies governed by public law; or subject to management supervision by those bodies; or having an administrative, managerial or supervisory board, more than half of whose members are appointed by the State, regional or local authorities or by other bodies governed by public law.

329 §1(1), *supra* note 319.

330 Schedule 1 UK FOIA, *supra* note 320.

331 *ibid.,* Part I 5, 6.

332 §552(f)(1) US FOIA, *supra* note 321: any executive department, military department, Government corporation, Government controlled corporation, or other establishment in the executive branch of the Government (including the Executive Office of the President), or any independent regulatory agency.

333 Because the status of each public authority should be described within the law, and therefore its rights and obligations with regard to the activities it carries out.

information policy at the federal government level[334] that promotes "a strong freedom of information law, no government copyright, fees limited to recouping the cost of dissemination and no restrictions on re-use."[335] The situation in Europe is quite the opposite: public bodies are allowed to recoup their investment in the production of public sector information and compete on the market for information products alongside private companies. For instance in the UK, the Ordinance Survey, as a Crown Corporation, is responsible, among other things, for dissemination of topographic maps, and has the right to establish prices for its products and services. In the majority of the EU Member States, closed access to commercially valuable government GIS records prevails.[336] According to some researchers, the European approach is explained by the mandate of the public bodies to make highly processed information products, whereas in the USA this activity is normally made by the private sector.[337] Another set of potential difficulties in enforcing the FOIAs comes with the second restriction as to the scope of available public sector information – the determination of what information exactly[338] a public authority is mandated to share with the citizens. The details regarding the restrictions by object are discussed below.

b. Exercising the right of access to public sector information

Normally the FOIAs establish the right of the citizens to request public sector information from the public bodies or convey the corresponding obligation on the

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334 The analysis of state and federal legislation shows that the approach to information dissemination is inconsistent and as varied as the issues involved. *See* e.g. Dansby, H.B. A Survey and Analysis of State GIS Legislation, *supra* note 55.

335 Weiss, P.N. & Backlund, P. *supra* note 56.

336 Onsrud, H. J. "Geographic Information Legal Issues", *supra* note 68.

337 Loenen van, B. & Zevenbergen, J., *supra* note 128, at 252-253, 256.

338 Particular datasets or specific types of information.

latter.[339] It may not be as easy as it seems to determine who the public authorities are and what information they can provide to citizens. But even when these are identified, the scope of right is narrowed down as a result of decision made as to what kind of public sector information is made available and who has the right to access it.[340] As a result, the established right is never unconditional, and some of the typical restrictions, in particular those that may have an influence on the access to and re-use of remote sensing data and information, are discussed below. No matter what restrictions are inbuilt into the framework of access to public sector information, the most important thing is the preservation of the general principle of the right to access information.[341]

i. Full access, with some restrictions

The underlying principle of access to public sector information is openness and sharing. Its recognition as the constitutive rule of the regime is a significant achievement as it facilitates use of data and information. The public has a general right to request information held or produced by public bodies according to the rules of FOIAs. This principle was reinforced by the courts in different jurisdictions. For instance, a US court rendered a decision in 2005,[342] in which it emphasized the FOIA statutory policy which favours disclosure, explaining that "any exception to that rule will be narrowly construed in light of the general policy of openness expressed" in the Act.[343] The

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339 Right to (Anspruch auf) in §1(1) German FOIA, *supra* note 319; person is "entitled to" in Part I 1(1) UK FOIA, *supra* note 320; agency "shall make available" in §552(a) US FOIA, *supra* note 321.

340 Blakemore, M. & Craglia, M., *supra* note 62.

341 *See* e.g. OECD, "Recommendation of the Council for Enhanced Access and More Effective Use of Public Sector Information" C(2008)36 (April 30, 2008). Online: <http://www.oecd.org/dataoecd/0/27/40826024.pdf> (last accessed 01.02.2011). The document places "openness" and its treatment as a fundamental principle of access to and use of public sector information as the first, and the necessity of transparent conditions for re-use as the second recommendation; it also reiterates that although copyright should be respected, the ways should be found to make even copyright-protected information works as widely accessible and available for re-use as possible.

342 *Director, Department of Information Technology of the Town of Greenwich v. Freedom of Information Commission et al*, SC 17262. Conn. Sup. Ct. 2005.

343 Quoting *Ottochian v. Freedom of Info. Comm'n,* 604 A.2d 351 (Conn. 1992). For a general discussion of the impact of the new technologies on the enforcement of FOIAs and access to databases (in

principle of the prohibition of unnecessary[344] charges for the public sector information in Europe was recently addressed by several Italian courts that found illegal the introduction of a fee for each re-use of already purchased information by private companies.[345]

Nevertheless, there is no rule without exceptions: all existing FOIAs have lists of exemptions that preclude access to certain information. These lists are often formed according to different principles: in the form of absolute and discretionary exemptions in the UK FOIA, or as nine broad categories in the US FOIA. Normally, exemptions to granting access to information include the following:[346] information is accessible to the applicant by other means;[347] the issues of national security, defence[348] and of international relations are at stake;[349] information concerns health and safety, or personal information.[350] Another important restriction is the situation where information constitutes a trade secret, another type of intellectual property asset[351] or is private and confidential.[352] The categories or examples of the exemptions do not coincide across jurisdictions. For instance, the US FOIA specifically codifies the exemption to freedom of access for geological and geophysical data and information concerning wells,[353] and the PSI Directive states that a document will not be supplied if it is outside the scope of activity of the public authority as defined by law.[354] Such

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the US) see Bloom, I. "Freedom of Information Laws in the Digital Age: The Death Knell of Information Privacy" (2005-2006) 12:3 *Rich. J.L. & Tech*. 9.

344 That often implies generation of revenues.

345 *See* e.g. Summary of the Judgment of the Regional Administrative Tribunal of Lazio (March 29, 2006). Online: <http://www.epsiplatform.eu/content/download/26298/346302/version/1/file/Summaries+of+the+Italian+cases+on+Directive+2003+version+2.pdf> (last accessed 01.02.2011).

346 For a more detailed analysis *see* MacDonald, J. (QC) & Jones, C.H. eds., *The Law of Freedom of Information* (Oxford University Press, 2003) at 9.25-9.77.

347 E.g. Part II 21 UK FOIA, *supra* note 320.

348 E.g. Article 1 (2)(c) PSI Directive, *supra* note 317; §3 1(b)(c); §552 (b)1(a) US FOIA, *supra* note 321.

349 E.g. §3 1(a) German FOIA, *supra* note 319; Part II 27 UK FOIA, *supra* note 320.

350 E.g. §5 German FOIA, *ibid*.; PART II 38, 40 UK FOIA, *ibid*.

351 E.g. Article 1 PSI Directive, *supra* note 317.

352 E.g. §552(b) US FOIA, *supra* note 321.

353 *Ibid*., para. 552(b)(9).

354 Article 1(2)(a) PSI Directive, *supra* note 317.

activities typically include the supply of information products exclusively on a commercial basis and in competition with the market.[355]

Apart from the restrictions that are driven by the specific content of information or a data set, the restrictions imposed can be in form of charges or fees for accessing public sector information.[356] Here again, there are differences in approaches among different legal systems. The US adopted the principle of providing information at the cost of fulfilling user request,[357] whereas the European legislator allows public bodies to make profit when providing access to information they produce and hold.[358] For instance, the PSI Directive[359] grants the Member States the right to determine whether the fees that secure "a reasonable return" on investment[360] can be obtained by the public bodies when releasing information they produce. The case is similar with the INSPIRE Directive that extends the provisions of the PSI Directive and imposes the obligation on Member States to establish and operate a network of services for spatial data sets and services. Its Article 11 leaves Member States the possibility to introduce charges on the services and data provided.[361]

As with the tightening of copyright protection and especially with introducing the *sui generis* database right, the European approach regarding charges for access to public sector information has been subject to criticism. In the geographic information sector one of the most cited examples concerns the market for meteorological information and

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355 *Ibid*., Recital 9 of the Preamble. *See* also Janssen, K. "INSPIRE and the PSI Directive: Public Task versus Commercial Activities?" (Paper presented at the 12th EC-GI&GIS Workshop, June 21-23, 2006). Online: <http://www.ec-gis.org/Workshops/11ec-gis/papers/303janssen.pdf> (last accessed 01.02.2011) [Janssen, K. "INSPIRE and the PSI Directive"].

356 The difficulty in doing so derives some of its reasons from the fact that geographic information has some (important) value to the society, which unfortunately is not easy and not clear how to measure. *See* Genovese, E. *et al*. "The EcoGeo Cookbook for the Assessment of Geographic Information Value" (2010) 5 *Int. J. Spatial Data Infrastructures Research* 120-144.

357 §552(4)(A)(ii)(I), *supra* note 321. The same section lays down the conditions under which no fees at all may be imposed on the person requesting public information.

358 *See* Article 6 PSI Directive, *supra* note 317, calling it "reasonable return on investment".

359 *Ibid*., Article 1(1) PSI Directive.

360 *Ibid*., Recital 9 of the Preamble, Article 6. *Cf*. with the recent Italian courts' decisions highlighted earlier.

361 INSPIRE Directive, *supra* note 29. *See* also Janssen, K. "INSPIRE and the PSI Directive", *supra* note 355.

services. In Europe private companies have to buy relevant data and information from public bodies,[362] with whom they compete on the same market.[363] In general, there are a lot of proponents of access to public sector information at lower or no cost. Some studies suggest that the return on investment does not necessarily have to come from the access charges, since public data are of high value for society. A recent simulation conducted by Finnish researchers suggests that if the prices for public information do not grow, the GDP will increase by €6 to 12 million[364] within the next five years.[365]

An access-for-a-fee model that is oriented at either generation of revenue or return of investment can in fact impede the development of the relevant market on which a particular type of public information is used.[366] It is being realised now also in Europe, where data access policies may turn to a more US-resembling model of less charges for the government-held information. This situation has certain parallels to the issue with more extensive copyright protection as opposed to its classical scope limited by law and the exceptions for users of copyrighted works. As practice shows, it is not necessarily the strategy of more protection and greater focus on immediate return of investment that may be the most effective, particularly in the long-term perspective. The examples cited of market and value-adding industry development in the US and Europe provide vivid evidence of what practical results decisions based on different premises as how to treat public sector information can produce.

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362 As was mentioned earlier, this situation is due to the mandate of the public bodies in a lot of the Europe an countries to produce value-added information products on one hand, and because some of these public bodies have to finance themselves and therefore have to offer their products commercially.

363 A market that is estiamted at between €10 and 30 million. For this and other relevant data *see* Dekkers, M. *et al*. "MEPSIR: Measuring European Public Sector Information Resources. Final Report of Study on Exploitation of Public Sector Information – Benchmarking of EU Framework Conditions" (June, 2006) at 33. Online: <http://www.epractice.eu/files/media/media2575.pdf> (last accessed 01.02.2011).

364 Imagine what can happen if the prices are lowered or changed by the COFUR model.

365 „Spatial Data Sharing and Distribution of Principles - Pricing principles and analysis - People's economic impact simulation" (October 9, 2009). In Finnish. Summary online: <http://www.epsiplatform.eu/news/news/low_psi_price_boosts_gdp> (last accessed 01.02.2011).

366 For the analysis of the revenue model *see* "PSI Feast or Famine? – What does the Future Offer?" (Paper presented at the AGI conference, September 2006). Online: <http://www.epsiplatform.com/content/pdf/467> (last accessed 01.02.2011).

The problem with the access-for-a-fee model may lie in the fact that it is not easy to assess and establish the value of public sector information, including geographic information in general, and remote sensing data and information in particular.[367] This process includes the analysis of the concepts of value, of the nature of information and of the value of the information in question, none of which can be measured solely in monetary dimension.[368] Furthermore, the assessment of the value of public sector information in general combines the knowledge of and factors from both technical and societal sciences.[369] Apart from the difficulties in determining how much exactly a particular type of public sector information costs, there is evidence that a free-access model can generate financial benefits in the long run, particularly for the downstream market of value-added information products and services.[370] Another factor that influences the process of establishing the value of public sector information is the acknowledgement that it has different users that may require a user-specific approach for access and pricing in case a fee-access model is used.[371] Taking this into account, cost-recovery strategies seem to be suitable only for some categories of users, like

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[367] *See* a comprehensive discussion of the difficulties in De Vries, W.T & Miscione, G. "Measuring the Unmeasured – the Value of Geo-Information" (2010) 5 *Int. J. of Spatial Data Infrastructures Research* 77-95. This situation again has parallels to the difficulties in proving that, for instance, a longer term of copyright protection will facilitate creation of more works. *See* e.g. the details of the discussion regarding the adoption of the EU Term Directive in e.g. "The Proposed Directive for a Copyright Term Extension – A backward-looking Package" Academic joint statement to the members of the European Parliament (October 27, 2008). Online: <http://www.uusi.ihmiskunta.org/index.php?option=com_content&view=article&id=1200:the-proposed-directive-for-a-copyright-term-extension--a-backward-looking-package&catid=55:media&Itemid=57>. For an extensive survey of the relevant literature *see* "Independent Studies of Copyright Term Extension" (Bournemouth University, centre for Intellectual Property Policy and Management, 2009). Online: <http://www.cippm.org.uk/downloads/Studies_and_Signatories.pdf> (last accessed 01.02.2011).

[368] A more detailed analysis of how to establish (using the concept of the value chain of geographic information) the value of geographic information *see* in Genovese, E. *et al*., *supra* note 356.

[369] *See* the discussion regarding seeing handling of geographic data as socio-technical practice in Crompvoets, J., De Man, E. & Geudens, T. "Value of Spatial Data: Networked Performance beyond Economic Rhetoric" (2010) 5 *Int. J. of Spatial Data Infrastructures Research* 96-119.

[370] Genovese, E. *et al*., *supra* note 356, citing Welle Donker, F. "Public Sector Geo Web Services: Which Business Model Will Pay for a Free Lunch?" in *Proceedings of GSDI 11 Conference* (Rotterdam, June 15-19, 2009).

[371] Van Loenen, B. "Developing Geographic Onformation Infrastructures: the Role of Policies" (2009) 23:2 *Int. J. of Geo. Info. Sc.* at 201.

governments and private sector, but would preclude other types of users, like researchers, from accessing public sector information altogether.[372]

The most important conclusion to the discussion above is that, notwithstanding the limitations of access to public sector information, statutory regulations grant the *right* of access to public sector information in the first place. Restrictions on access can only be imposed by means of exemptions that the regulations themselves contain. It is the *manner* in which exemptions are drafted *and not their content* that has a crucial impact on access to remote sensing data and the modes of their dissemination. This is the most significant distinction of FOIAs as compared to intellectual property rights and licensing, as well as the point of departure for the argument in favour of broader access to remote sensing data and information. For this purpose, the discussion regarding its relation to the copyright protection regime, as well as the influence on the patterns of access to and use of information is necessary.

ii. Copyright over public sector information

As with the conditions of access to public sector information, the approaches to the relevance of intellectual property rights with regard to its protection established in the jurisdictions across the ocean differ as well. The US has a general principle of not applying copyright protection to any information assets produced by public bodies. Europe, on the other hand, accepts government copyright in the information products that public bodies generate.[373] Nevertheless, according to the PSI Directive, public bodies may not use their copyright or other intellectual property rights in a way that would hamper re-use of the information they produce or hold.[374] Only intellectual

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372 *Ibid*., at 203.

373 *See* a general overview in Uhlir, P., Sharif, R.M. & Merz, T. "PSI Online: Measuring the Social and Economic Cost and Benefits: Review of the Literature and Future Directions" (Paper presented at OECD WPIE workshop on public sector information, February, 2008). Online: <www.oecd.org/dataoecd/23/42/40170933.ppt#258,3> (last accessed 01.02.2011).

374 In fact, intellectual property rights should be exercised in such a way, as to facilitate re-use, Recital 22 PSI Directive, *supra* note 317.

property rights of third parties may constitute an exemption to the right of access to public sector information.[375]

In essence though, the principles of applying copyright and other intellectual property protection regimes to public sector information do not differ from those for other intellectual creations. Therefore, in order to decide, which information produced by the public bodies in Europe is protected by copyright, one has to analyse the relevant copyright protection norms (national and international), apply the creativity criterion to the information product in question and decide whether copyright protection can be granted to its author. It is therefore not necessary to engage into a separate discussion of the issue of copyright protection of public sector information: the analysis of the applicability of copyright protection to remote sensing data and information was undertaken in the previous chapter.

The main concern regarding application of copyright protection to public sector information is its use to foreclose information that otherwise would have been available to the citizens. In principle, copyright protection can be applied where necessary and appropriate. But its application should serve the purpose of acknowledging the authorship and the ownership over the data and information, rather than to impose unnecessary barriers and restrictions over their re-use. One should not forget that, in the long run, protection and enrichment of the public domain is an equally important task assigned to the intellectual property protection regimes, as that of safeguarding the interests of the authors and other rightholders, especially in cases where information is produced by the public bodies.

From this perspective there is very little difference between tackling the issue of access to public sector information and that of access to other types of data and information, including privately generated remote sensing data. Looking back at the previous chapter, the question arises as to whether the underlining principle of copyright protection that establishes the freedom of using ideas by protecting only the form of a

[375] Janssen, K. "INSPIRE and the PSI Directive", *supra* note 355.

work, and not its content, should ever be compromised in order to protect new intellectual assets such as remote sensing data and information. It is clear that the public sector information and copyright protection regimes are not based on the same principles and refer to different branches of law. At the same time, they both deal with intangible assets and norms from both fields can be applicable to the same subject-matter. Therefore, the principles of the more appropriate regime can in theory be applied to information with no regard to its origin – private or public. Practical examples show that the recognition of the necessity to share information, including remote sensing data, as in the case with the regime of access to public sector information, provides new opportunities and better incentives for the development of the information value-adding industry.[376] Information products generated by the value-adding companies can and should when necessary be protected by copyright, with the preservation of the regime's original balance between the rights of authors and the exceptions left for users. Such an approach incorporates the best principles of both fields of law and serves the achievement of balance of interests that different players within the relevant information market have.

3. Impact of the right of access on use and dissemination of remote sensing data

The recognition of the right of citizens to access public sector information and the acknowledgement of the necessity to share information in general for its best use are extremely important steps, particularly in the information society and its economy. Even a quick look at some economic and statistical data provides enough evidence to support this statement. Public sector information represents an often indispensable building block for advanced and sophisticated geographic information products that serve the

[376] Like the case of the development of the private weather forecast services in the USA and Europe, as well other examples brought later on in this chapter.

exact needs of various end-users.[377] In Europe, for instance, 80% of all information produced by public bodies is estimated to entail a geographic component.[378] In the UK, 22% of information products and services are generated using public sector information.[379] Researchers believe that the value-added products and services greatly contribute to economy and increase the value of geographic information in general.[380]

The geographic information sector is one of the biggest within the overall market for information products and services.[381] Back in 2005, the global geographic information industry was estimated at the total of US$3.3 billion with expected annual growth rates of over 10%.[382] Apart from forming a separate market niche, geographic information products and services can be objects of trade in other markets, like the one for environmental goods that includes waste-water management (34%), air-pollution control (10%) and environmental monitoring analysis and assessment (15%).[383]

In Europe, the public sector remains the main consumer of remote sensing data and information products, services and applications: it purchases 78% of all marketed

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377 As for example in case of developing Google Earth application, *see* Domenico, C. "Re-use of Public Sector Information in the US: An Incentive for Competition and a Potential Benefit to the Public" (Paper presented at the International Symposium Public Data on the Private Market – New Regulations on the Re-Use of Public Sector Information, June 4-5, 2007). Online: <http://www.lda.brandenburg.de/media/2628/Domenico_070605.pdf> (last accessed 01.02.2011).

378 Loenen van, B. & Zevenbergen, J., *supra* note 128, citing Robinson, M. "Improved Policy for Coordinating the Development of the National Spatial Data Infrastructure" (Paper presented at the FIG conference, April 19-26, 2002). Online: <http://www.fig.net/pub/fig_2002/Ts3-5/TS3_5_robinson.pdf>. *See* also OECD, Working Party on the Information Economy, Directorate for Science, Technology and Industry, "Digital Broadband Content: Public Sector Information and Content" DSTI/ICCP/IE(2005)2/FINAL (March 30, 2006). Online: <http://www.oecd.org/dataoecd/10/22/36481524.pdf> (last accessed 01.02.2011).

379 Dekkers, M. *et al*., supra note 363, at 42, citing Sir Bryan Carsberg, President of Locus, at the launch event of the Locus association (London, 26 January 2006).

380 Genovese, E. *et al*. "Evaluating the Socio-economic Impact of Geographic Information: a Classification of the Literature" (2009) *Int. J. of Spatial Data Infrastructures Research* 4 at 222.

381 Mäkelä, J. "Aspects of Licensing and Pricing Model for Multi-Producer pan-European Data Product" (2010) 5 *Int. J. of Spatial Data Infrastructures Research* (under review). Online: <http://ijsdir.jrc.ec.europa.eu/index.php/ijsdir/article/viewFile/164/197> (last accessed 01.02.2011).

382 Loenen van, B. & Zevenbergen, J., *supra* note 128, at 245 with citations.

383 Bijit, B. & Teh, R. "Tariffs and Trade in Environmental Goods" (Presentation to the WTO Workshop on Environmental Goods, Geneva, 2004). Online: <http://www.wto.org/english/tratop_E/envir_e/wksp_goods_oct04_e/teh_wto_e.ppt> (last accessed 01.02.2011).

products.[384] The market for remote sensing data is growing: in 2007 revenues from all sales were estimated at US$735 million, which represented a growth by a Compound Annual Growth Rate (CAGR) of 15% over the period of five years.[385] World-wide commercial data market passed the threshold of US$1 billion in 2009.[386] It is expected to increase and generate revenues of up to US$3 billion by 2017,[387] particularly if the position of the value-adding industry is strengthened.

Statistical data regarding production of, access to and re-use of public sector information, the patterns of market development in this sphere, as well as the behaviour of the value-adding industry participants of the secondary market for geographic information products and services are greatly influenced by the nature and the principles of the relevant legal framework. For instance, provision of geographic information products in Europe was much more restricted before the PSI Directive was transposed into national legislation of the EU Member States due to the restrictive practices regarding access to public sector information established by some national public bodies or quasi-state organisations, like for instance the already mentioned Ordnance Survey in the UK that enjoys a monopolistic position in the UK geographic products market.[388] With time such practices drew both judicial and legislative attention, and the access to public sector information was opened to a greater extent.[389] The numbers below speak for themselves.

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384 Seiz, G. *et al*. "Earth Observation Market Development: Benefits to Industry" *ESA Bulletin* 125 (February 2006). Online: <http://www.esa.int/esapub/bulletin/bulletin125/bul125d_seiz.pdf> (last accessed 01.02.2011).

385 Keith, A. "Transformation of the Earth Observation Sector" *SatMagazine* (May 2008). Online: <http://www.satmagazine.com/cgi-bin/display_article.cgi?number=58249124> (last accessed 01.02.2011).

386 Brun, K. "Status and Future Prospects for Earth Observation" (Euroconsult presentation at the International Astronautical Congress, Prague, September 28, 2010) [on file with the author].

387 Keith, A. & Bochinger, S., *supra* note 130.

388 Dekkers, M. *et al*., *supra* note 363, at 45.

389 As in the case of the Ordnance Survey practices: several litigations made OS share more data on more reasonable terms of re-use with private companies active in the same market. The discussion of the problematic areas regarding behaviour of Ordnance Survey *see* in Pitt, E. "Ordnance Survey – the Ground Rules" (November, 2003). Online: <http://www.epsiplatform.com/examples/cases/ordnance_survey>. For the matters that cases may be concerned about s*ee* "Association of Census Distributors and Ordnance

Since the enactment of the PSI Directive in Europe the availability of data for free re-use resulted in the increase of the volume of downloaded public sector information in the geographic information sector alone within 2002-2007 by up to 700%.[390] As the European Commission stated in its Communication in May 2009, national meteorological offices recorded an around 70% increase in downloads of data and information from their archives between 2002 and 2007, and in 2006 the EU meteorological market was estimated at €530 million, which was a 60% increase as compared to 1998.[391]

Nevertheless, there is a need for further improvement of the modes and extent of use of public information in Europe, as the latter is still far from catching up with the level of similar developments in the US, which again brings forward legitimacy and importance of the open access to and as little as possible restricted re-use conditions for public sector information.[392] For instance, some problems that the European re-users of geographical and meteorological data and information face are high prices, restrictive licensing conditions and discrimination. The main reason for this lies in the legislator's choice of a short-term cost recovery strategy, as opposed to the promotion of benefits in the wider economy by virtue of promoting open and unrestricted access to such information.[393] The advancement of the public sector information re-use industry in the

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Survey" Office of Public Sector Information Report on its Investigation of a Complaint (SO 42/8/5). Online: <http://www.nationalarchives.gov.uk/documents/so-42-8-5.pdf> (last accessed 01.02.2011).

[390] "Assessment of the Re-use of Public Sector Information (PSI) in the Geographical Information, Meteorological Information and Legal Information sectors" MICUS Study (December 2, 2008) at 35. Online: <http://www.epsiplus.net/content/download/18836/240226/file/MICUS-Studie_PSI_EU_long.pdf> (last accessed 01.02.2011).

[391] The Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (SEC(2009)579) COM(2009) 212 final (May 7, 2009) at 5. Online: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0212:FIN:EN:PDF> (last accessed 01.02.2011) [Commission's Communication].

[392] PSI data value in Europe and the US: investment value – €9.5 billion and US$19 billion; economic value – €68 billion US$750 billion. *See* Weiss, P. N. "Borders in Cyberspace: Conflicting Public Sector Information Policies and their Economic Impacts" U.S. Department of Commerce (February 2002). Online: <http://www.weather.gov/sp/Bordersreport2.pdf> (last accessed 01.02.2011).

[393] Commission's Communication, *supra* note 391, at 3. Commission explains that the situation can be partly explained by the fact that the European public bodies at least partially self-finance their activities, which results in competition between them and private users of the same information.

US, on the other hand, can be partly explained by the US government choice of a strategy of strong encouragement of the private sector and the society as a whole to re-use public information. To enable this strategy, the regulations grant private users broad rights with regard to electronically accessible public sector information. In addition, due to the absence of copyright protection, there is an extensive room for its commercial re-use and almost no restrictions on re-use for non-commercial purposes. Finally, fees for re-use are either waived or limited to the costs of reproduction and dissemination.[394]

4. Access to public sector information and the common good

The concept of public sector information might need a better definition. The necessity to revise the norms restricting access to it may become pertinent. Public sector data and information may be protected by intellectual property rights notwithstanding their nature and purposes of use. Nevertheless, the most important feature regarding this field of law and the principles of treating public sector information is the recognition by the legislators of the right of the citizens to access and re-use it. The brief analysis of the regime of access to, sharing and re-use of public information undertaken in this chapter does not aim at extensive criticism of the legal rules that form it. This analysis should serve as a basis of the realisation that importance of public sector information in general and remote sensing data in particular should lead to the establishment of a legal regime that guarantees a broader access to them.

Successful existence of the framework of generation, use, exchange and sharing of public sector information is itself evidence that when the welfare of the society and the participation of the citizens in governing it are involved, the issues of the return of investment and of the protection of purely commercial interests of separate groups and stakeholders should not necessarily be given priority when determining the regime suitable for governing this type of information. Utilitarian economic rationale and profit-making goals are not the only reasons to drive the decision- and law-making in different

394 *Ibid*., at 3.

spheres. Often, orientation on the social order of the society and the assessment of the needs of its more vulnerable members help the adoption of policies and laws that in the long run meet also the interests of the private sector. This is especially true for the areas of re-use and distribution of information from a single source, to which public sector information belongs. Locking it up with the producer or holder can jeopardise the initial purposes for which such information is designed. Too much emphasis on the issues of ownership and its protection may result in a situation where the information about activities of public bodies or produced by them becomes an asset that only a few can afford to purchase. This should not be the case in any democratic society.

Exceptions and restrictions that limit exercise of the right to access to public sector information are a necessity, as the system of production of such data and information is complex, the issues to which they pertain may be highly sensitive security-, privacy- or otherwise. But even the existence of the exceptions itself reinforces the underlining principle of the *right* to access public sector information, as absolute rights rarely exist in practice. The case of the classical interpretation of the scope of copyright protection supports this viewpoint. A balance between the founding principle of the openness of public sector information and the exceptions that aim at safeguarding freedoms and security of others should be found and properly articulated in order for the regime of access to and re-use of public sector information to be effective. Such a regime is best-suited to reinforce the importance of access to prior art and knowledge to create new intellectual property assets, and the choice in favour of openness and accessibility will very much influence the development of the value-adding information industry.[395]

The phenomenon of public sector information and the framework setting up the access to it exists because societies realise the fact that re-use and further distribution of information will improve the greater good – the better functioning of societies.[396]

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[395] Cutler, T., *supra* note 263, at 33.

[396] *See* e.g. in the S*tatement issued by President Clinton upon signing the 1996 FOIA amendments into law* (October 2, 1996). Online: <http://www.justice.gov/oip/foia_updates/Vol_XVII_4/page2.htm> (last accessed 01.02.2011); Recital 16 of the Preamble of the PSI Directive, *supra* note 317.

Availability of information for further utilisation may lead not only to a more active participation of citizens in the decision-making processes within a given society, but also contribute to the development of the new areas of private or commercial activities and markets. In fact, the European legislator, at least within the regulations it adopts, directly links harmonisation of the laws of the Member States regarding re-use of public sector information to the establishment of the relevant internal market,[397] taking into account the fact that public sector information is an important raw material for digital content products and services, the European market for which is estimated today at €27 billion.[398]

It is obvious that in order to promote a piece of legislation nowadays strong lobbying and appropriate "packaging" are very much required. Therefore, the notion of market development becomes necessary to acquire support of the industry for this or that project and its legislative framework. Nevertheless, if one takes a look at the reasoning and the logic of the FOIA statutes, it is obvious that the economic and development reasons are not the only ones that are of concern when adopting the rules these regulations contain. Intangible goods like involvement of the citizens in the decision-making processes in the society and the transparency of the activities of public bodies are not less important goals that the FOIAs try to achieve when declaring the right of citizens to access public sector information.

Sharing, respect for each other and other humanitarian values are rooted in human nature and our socially-oriented life, and cannot be disregarded when adopting regulations. One of the theories that works with these notions as indispensible factors influencing law-making develops the concepts of the common good and common property that are influential when determining the conditions of existence and the scope of private property right. A closer look at the milestones of this theory and the development of its key concepts over time in the history of philosophical thought is

397 Recitals 1, 5 of the Preamble of the PSI Directive, *supra* note 317.

398 *See* Commission's Communication, *supra* note 391. Note that Dekkers, M. *et al*., *supra* note 363, indicate almost the same number – US$26.1 billion.

helpful not only to understand that regulations recognising the right to access public sector information contain viable and very necessary mechanisms for the contemporary society, but that the same logic of the necessity to share may be applied to privately generated information and remote sensing data.

5. Conclusions

The concept of the public good and its core properties of non-rivalry and non-excludability, as well as the new developments that contribute to a broader understanding of its scope, were briefly addressed in this chapter. The arguments presented serve the purpose of showing that information in general and remote sensing data in particular may be declared public goods at least for two reasons: they meet the two main criteria, and their applications may greatly benefit the society at large. From the regulatory perspective, recognition of remote sensing data and information as public goods amounts to granting them the status of public sector information. The regime of access to and use of information produced by or on behalf of public bodies is represented as an alternative to copyright and other forms of intellectual property protection that are extensively used today, particularly by the private sector. The main reason for this is that it focuses on the use-rights aspect of data utilisation, as opposed to the ownership-rights of holders of copyright or other intellectual property rights that lately are emphasised and protected more vigorously: a situation that according to this research leads to locking up information, and is therefore a negative trend. Recognition and promotion of the right of access to public sector information influence greatly the ways and modes in which public sector information is used and distributed. In addition, it entails the information a different paradigm – that of a resource to be shared in order to get more benefits from it for all actors involved.

The analysis of the current legislation and judicial practice in Europe and the US shows that the approximation of laws that govern access to and use of public sector information is much more a trend than within the sphere of copyright protection

regulations. The European legislator is shaping the approach to the treatment of public sector information based on the principles which are closer to the freedom of access to information and its availability at low or no cost that are preserved and promoted in the US. Transposition of the EU regulations in the national legislation of its Member States contributes to the universality of their content and application. The latter is particularly important for the improvement and facilitation of extensive use and effective distribution of remote sensing data, since they are used all over the world and exchanged among or distributed by generators and users from various jurisdictions.

The next chapter seeks to provide a teleological basis for treatment of remote sensing data by virtue of a regime similar to that of the public sector information that is not limited by the nature of the source of their generation. It is based on the theories of common property and the common good that focus on the principle of sharing as the foundation of legal regimes governing exercise of any type of proprietary rights. The findings regarding the possibility of qualifying information in general and remote sensing data in particular as public goods – most importantly due to the enormous value that their use can bring to a society, as well as to their contribution to generation of knowledge – are resorted to in order to substantiate the viability and effectiveness of applying the principle of sharing to their use and distribution.

Chapter 4: The notion of the common good in theories of property

The legal regime of access to and re-use of public sector information recognises the right of the citizens to request information that public bodies produce or are holders of. The reasons for adopting such an approach to this type of information vary and include above all the transparency of governmental activities and the accountability of governments for them;[399] the improvement and better functioning of a democratic society; the provision of useful information usually not available from any other sources; and the development of the market for value-added products and services that use public sector information as their primary raw material.[400] The purpose that unites these various reasons is to achieve a goal important for the society as such, but one that is unreachable by its separate members. Based on this, the element common to both the reasons to regulate and the enforcement measures is the principle of sharing, without which distribution and use of public sector information is hardly possible.

Legal norms, to be effective in their implementation and enforcement, have to reflect the reality and distinctive features of the existing relations within a society on the one hand, and be based on the values and aspirations of that society on the other.[401] The former serves their instrumental effectiveness, whereas the latter is a means to justify and legitimise their existence and particular content. As seen in the previous chapter, the legislators in different jurisdictions have recognised the right of citizens to access public sector information, including remote sensing data. The analysis of the scope of

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399 *See* e.g. the Ashcroft FOIA Memorandum (October 12, 2001). Online: <http://www.fas.org/sgp/foia/ashcroft.html>, as well as the newest Holder FOIA Memorandum (March 19, 2009). Online: <http://www.justice.gov/ag/foia-memo-march2009.pdf> (last accessed 01.02.2011). Both documents state that open government is a fundamental commitment of the USA. These arguments include both access to information in government hands, as well as cost-fairness ("we paid for it") and cost-accountability ("we are entitled to see how it is used") arguments.

400 *See* e.g. Recital 5 of PSI Directive Preamble, *supra* note 317.

401 *See* the discussion on the morality (as the concern of how to co-exist in a society) and the law in McLeod, I. *Legal Theory* 4th edn (Basingstoke: Palgrave Macmillan, 2007) at 28-29.

this right leads to the conclusion that one of the organising teleological foundations that underlie its existence is the common good. Its evolution and substance are closely linked to the theory of common property.

This chapter seeks to bring forward the core arguments and principles upon which the theories of the common good and common property are based, and to substantiate the legitimacy of the existence and the exercise of the right to access information. Its last part contains the analysis of the ways to apply the theory of the common good to remote sensing data generated by both publicly and privately owned and operated satellites, thereby making sharing of data the principle viable not only for the regime of access to public sector information, but for some privately-generated data as well. The premise for this is that sharing does not necessarily hamper the exercise of property rights (in the form of copyright, for instance) attached to such data. Their potential to contribute to the common good operates as an additional criterion of validating the principle of sharing when applied to the framework of distribution and use of remote sensing data generated by private companies.

1. From Aquinas to the information society

The theory of the common good goes back to ancient Greece and Aristotle as its originator.[402] It is intertwined with the concepts of law, statehood and policy, with the notion of morality and with the ultimate sense of life (being), which brings order into human organisation. The term "common good" is the end for which society exists, "a genuine good – *bonum honestum* – and not merely an instrumental or secondary good defeasible in the face of particular goods."[403] This concept, and the principles on which it rests, influence the understanding of the institution of property, and particularly of the communal dimension of exercising property rights, whether common or private.

[402] In e.g. *Politics* (1.1252a) and especially in *Eudemian Ethics* and *Nichomachean Ethics*, *supra* note 20. What follows is a Western theory of the common good: of course, there are others.

[403] Lewis, B.V. "The Common Good in Classical Political Philosophy" (2006) 25:1 *Current Issues in Catholic Higher Education* 25-41.

That is why the theory of common property, together with its relationship to allocation of private property rights and their execution, is also the object of discussion in this chapter. Apart from being a manifestation of the application of the theory of the common good, it is an illustration of how common and private aspects of the human and societal life can be complementary to each other and exist in harmony, while serving the achievement of the common good.

Theories of the common good and common property have survived a very long period of historical development. At the same time, the analysis shows that they evolved without fundamental changes regardless of the religion or the political beliefs of the philosophers who contributed to their elaboration. The appeal of the philosophers of the past to the philosophic-anthropological and ethical foundations of the societal life based on the commonality of people's desires is equally relevant in the modern societies that recognise the necessity to share and to help each other.[404]

Started by Plato and Aristotle, a Western theory of the common good was further developed by Thomas Aquinas,[405] and later referred to and refined by Grotius,[406] Hobbes,[407] Pufendorf,[408] Locke[409] and others.[410] Apart from being used in the discourse

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404 Keys, M. M., *supra* note 20.

405 *The "Summa Theologica" of St. Thomas Aquinas. Part I.* Literally translated by Fathers of the English Dominican Province. 2nd revised edn (London: Burns Oates and Washbourne, 1920-1922). 10 vols. [Summa Theologica].

406 Grotius, H. *Commentary on the Law of Prize and Booty,* van Ittersum, M.J. ed. (Indianapolis: Liberty Fund, 2006) [Law of Prize and Booty]; *The Rights of War and Peace, including the Law of Nature and of Nations,* translated from the Original Latin of Grotius, with Notes and Illustrations from Political and Legal Writers, Campbell, A.C. (New York: M. Walter Dunne, 1901) [The Rights of War and Peace]; *The Free Sea, trans. Richard Hakluyt, with William Welwod's Critiuqe and Grotius's Reply,* Armitage, D. ed. (Indianapolis: Liberty Fund, 2004) [Mare Liberum].

407 *Hobbes's Leviathan reprinted from the edition of 1651 with an Essay by the Late W.G. Pogson Smith* (Oxford: Clarendon Press, 1909) [Leviathan]; *The English Works of Thomas Hobbes of Malmesbury; Now First Collected and Edited by Sir William Molesworth, Bart.,* 11 vols. (London: Bohn, 1839-45) [The English Works].

408 *The Whole Duty of Man According to the Law of Nature,* trans. Andrew Tooke, ed. Ian Hunter and David Saunders, with Two Discourses and a Commentary by Jean Barbeyrac, trans. David Saunders (Indianapolis: Liberty Fund, 2003) [The Whole Duty of Man]; Pufendorf, S. *De Jure Naturae et Gentium Libri Octo* (1672), trans. Oldfather, C.H. & Oldfather, W.A. (Oxford: Clarendon Press; London: Humphrey Milford, 1934); *Two Books of the Elements of Universal Jurisprudence,* translated by Oldfather, W.A. 1931. Revised by Behme, T. (Indianapolis: Liberty Fund, 2009).

409 Locke, J. *Two Treatises of Government*, Laslett, P. ed. (Cambridge: Cambridge University Press, 1988) [Two Treatises of Government].

regarding the nature and origins of (private) property over tangible things, the theory has also played its role in shaping the theory of intellectual property. For example, the Lockean interpretation of the theory of common good and common property through the commons as a basis for initial appropriation and his "enough and as good" proviso is one of the dominant property theories that is directly applied to the theory and justification of the existence of intellectual property.[411] Thus, the concept is long not dead and is attracting the attention of scholars in the search of explanations of why and how the functioning of the society can be changed for the better, as well as how these concepts can be used when passing relevant laws. A new wave of attention is paid to the theory of the common good since the second half of the twentieth century, as the necessity to understand the common purpose and common patterns of societal development is realised.[412]

The common good theory, apart from its other achievements, makes an important and valuable contribution to the treatment and assessment of the goodness[413] of both communal and private property: in what circumstances and to what extent each of them can serve the common good should not be underestimated. Not denying or questioning the very existence of private property,[414] this theory addresses the benefits of common property through its possible application to and the effect on the proper functioning of the society and its institutions. It focuses on the communal or societal aspect of private property rights as well. When doing so, it refers to the concepts of sharing, treating each other in a way adequate to the human dignity, doing something

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410 Like James Boyle in the contemporary setting: Boyle, J. *The Public Domain: Enclosing the Commons of the Mind* (New Haven, London: Yale University Press, 2008) [The Public Domain].

411 Taking this fact into account Locke's theory of the commons is not part of the present analysis. For details, *see* e.g. Gordon, W.J. A "Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property" (May 1993) 102:7 *The Yale Law Journal* 1533-1609.

412 Raskin, M. G. *The Common Good: Its Politics, Policies and Philosophy* (New York, London: Routledge & Kegan Paul, 1986) at 4. *See* also important research of Elinor Ostrom, e.g. in *Governing the Commons: the Evolution of Institutions for Collective Action* (Cambridge: Cambridge University Press, 1990).

413 In the sense of the achievement of the common good.

414 *See e.g. Summa Theologica*, *supra* note 405, II-II, question LXVI, §1.

good for the community for it in the long run to function better, and in return to improve the life of its individual members and oneself.

The theory of the common good that underlines and justifies the existence of common property is relevant for information, including remote sensing data for several reasons, and they are discussed in detail later in this chapter. Most importantly, since information, as an intangible good, is treated as an object of intellectual property protection, the modes of its use are influenced by the philosophy of the common good and common property.[415] These theories, therefore, form the basis of the argument in favour of the broader access to remote sensing data in particular. They can be used for the same purpose regarding access to information in general, although this aspect falls outside the scope of the research.

The hypothesis put forward in this research is that the right to access information, not depending on the type of its ownership, when based on the concept of the common good stemming from or reflected in the theory of common property finds a substantiated theoretical foundation to exist, and in the light of this theory is in fact something that *should* exist. Therefore, the chapter aims at establishing the link between the theories of the common good and of common property on the one hand, and of the right to access remote sensing data on the other. The specific link between remote sensing data and the common good is that they (data) may greatly contribute to the achievement of the latter, as for instance in the case when climate change researchers have access to data in order to be able to conduct solid and reliable research and prevent or mitigate the potential negative effects of climate change.[416] The discourse includes assessment of arguments and strategies of their utilisation in favour of the primacy of common property over private property, or rather – the modes of its execution with regard to intangible assets.[417] In light of the foregoing, special emphasis

[415] Particularly taking into account that intellectual property rights protect the form but not the substance: ideas, but not content.

[416] As opposed to the scenario when they do not.

[417] Common property over tangible goods will be brought into the discussion for the sake of comparison only.

is given to the ability of data and information to benefit the society as a whole, increasing its well-being and the "happiness" of its members.

The choice regarding the philosophers whose works are subject of the analysis is driven by two primary reasons. Firstly, all of them dealt or are dealing with the concepts of the common good and common property. Secondly, there is a significant time period between them: the research starts with medieval Aquinas, moves through the XVII century with Grotius and Hobbes, into the beginning of the XVIII century with Pufendorf through to James Boyle, who works on the issues of the public domain and access to copyrighted material in the new millennium. The time gap between Pufendorf and Boyle does not seem to pose a threat to (losing) the thread of continuity, since there are no major philosophers in between the two who greatly contributed in an original fashion to the development of the theories of the common good and common property.[418] The rationale for choosing philosophers is based on their contribution to the development of the theory of the common good as such, without immediate links to its application to intangible objects like data and information. The theories of the philosophers chosen do not necessarily entail the same arguments or are based on the identical premises; nevertheless, the ideal types of property regimes advocated for by all of them reveal commonalities in understanding the value of common property and the common good despite differences in approaches or emphasis. Commonality of their arguments regarding legitimacy of common property and sharing as the principle governing exercise of any property rights verifies the theories. Time span over which the theories were developed is evidential of their relevance regardless of the historical period of the state in which a society is in a given period.

Limited scope of the research makes it impossible to analyse all philosophical works relevant to the theories of common good and common property. The teachings of Aristotle are left outside the analysis partly because Aquinas builds upon his arguments and often refers to the theories of the Philosopher on the one hand, and is more important for the works of later philosophers on the other. The property theory of

[418] In the opinion of the author.

Locke is also not referred to in the research mainly because his works are traditionally resorted to in writings on the legitimacy of intellectual property as a legal construct. Apart from this, his work would have been relevant for the present analysis for two reasons. Firstly, his property theory rests on the argument that labour entails a moral freedom that justifies person's will to prosper but stipulates limits of this freedom set by the community.[419] Secondly, the property regime he develops promotes achievement of happiness[420] and preservation of the society[421] – the common good that is often referred to in the present analysis.

a. Aquinas' common good and property

Although Aristotle was one of the first western philosophers to work with the concept of the common good and its relation to private and common property,[422] Aquinas developed both of them in much greater detail.[423] Therefore, the latter's findings and analysis are addressed as the first and the most substantial treatment of the subject. Furthermore, at least in Europe, "since medieval times the explicit language of the common good has been particularly characteristic of Catholic social thought within the broad Thomistic tradition,"[424] and therefore, most of the later philosophers were referring to Aquinas when working with the concept of the common good. Despite the

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[419] For a thorough analysis of this dimension of Locke's work *see* Claeys, E.R. "Encroachment, Adverse Possession, and Labour Theory" (Paper presented at the Property Law and Theory Workshop, New York University School of Law, July 30-31, 2010) and the cited literature [unpublished manuscript, on file with the author].

[420] Locke, J. *An Essay Concerning Human Understanding*, Peter H. Hidditch ed. (Oxford: Oxford University Press, 1975), II.xxi.51, at 266.

[421] *Two Treatises of Government*, *supra* note 409, II.134, at 356.

[422] Lametti, D. "The Objects of Virtue", 1-37, *supra* note 20.

[423] For the later discussion it is important to note here that the Catholic Aquinas developed his theory based on the teachings of a pagan, which means that he found it possible to accommodate and integrate the virtues valued by Aristotle into his own theory of the common good. *See Summa Theologica*, *supra* note 405, I-II, question LXXXIV, article 5 for Aquinas' own explanation of the possibility. For more detailed discussion s*ee* e.g. Jordan, M.D. "Philosophy in a *Summa of Theology*", in *Rewritten Theology: Aquinas after his Readers* (Oxford: Blackwell, 2006) at 154-170.

[424] McCann, D. & Miller, P. D. eds., *In Search of the Common Good*, (New York, London: T&T Clark International, 2005) at 91.

fact that the range of the issues addressed by Aquinas is very broad, only those related to the common good and common property, as well as their relevance to private property are addressed in this section.

The concepts of the common good and common property are greatly intertwined and interdependent within the work of Aquinas.[425] Nevertheless, this analysis treats them separately for several reasons.[426] Firstly, such approach helps to develop clearer arguments underlying the hypothesis of this research and to formulate the basis on which the principle of sharing can be applied to both publicly and privately generated remote sensing data. Such an approach is also helpful for two other reasons. In addition, it enables to show how the concepts of the common good and common property influence each other's substance, as well as what their commonalities are. Lastly, it helps to emphasise the importance and indispensability of the notion of the common good, which brings forward the necessity of co-existence of individual and communal interests that accommodates them both, to shape and legitimise any property regime.

i. Universal possession of things as the primary form of property

Aquinas advocates in favour of the legitimacy of common property based on the premise that originally a universal community of all property prevailed.[427] He states that "separation of properties", alongside slavery, was "not induced by nature, but by the reason of men for the utility of human life".[428] In fact, he brings forward the primacy of common property by explaining that private property was introduced into the society at a later stage of its development: "possession of all (not separately) things and universal freedom are part of the natural law."[429] Thereby, Aquinas does not deny the legitimacy

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425 *See* Parel, A. "Aquinas' Theory of Property" in Parel, A. & Flanagan, T. eds. ,*Theories of Property: Aristotle to the Present* (Waterloo: Wilfrid Laurier University Press, 1979) 89-115.

426 The same scheme is applied to other philosophers as well, notwithstanding the fact that some philosophers do not specifically articulate the differences between the concept or do not name them at all, or refer to them using different terms.

427 *Summa Theologica*, *supra* note 405, II-II, question XCVIII, article 1.

428 *Ibid*., II-II, question XCIV, article V, §3.

429 *Ibid*., II-II, question XCIV, article V §3.

of existence of private property, but treats it as secondary to common property, as in the first place "there is in man an inclination to that *natural* good which he shares along with all *substances,* inasmuch as every substance seeks *the* preservation of its own being, according to its nature."[430] Individual possessions come only after this first natural inclination, and what is important for Aquinas' argument in favour of primacy of common property is the use-aspect that is discussed below.

When examining the characteristics of private property, Aquinas reiterates that it is natural for a man to have goods in his private possession, as it makes one look more after his own lot, as well as secures peaceful state of society.[431] Most importantly, his theory suggests that the emphasis has to be put on the purpose which private possession or property serves: it is inalienable from the common good of the society as a whole or the state. Essential is that the "man *ought not to hold exterior goods as exclusively his own, but as common possessions*, so as *readily to share them with others in their need*".[432] This statement shows that, to him, the supremacy of common property is a matter of fact and is explained by showing the essential tie between the common and individual goods. The link prescribes hierarchy, since the achievement of individual good is impossible without the common good of the family, state or kingdom: "for the good disposition of parts depends upon their relation to the whole."[433]

Such vision of the balance between the individual and communal good makes an important contribution to the discussion of the legitimacy of common property. Presence or more significantly – a symbiosis of the generic aspects of common property in all the things, including those in private possession and use[434] stipulates that people care about the community because individual well-being is only achievable within a community that prospers. The "ownership-use" dichotomy is important for Aquinas and

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430 *Ibid*., article II.

431 *Ibid*., question LXVI, article II. It must be noted here that the scope of the "need" is quite narrow for Aquinas, even though he stresses that the recognition of its obligatory character within the regime of private property is not questionable.

432 *Ibid*.

433 *Ibid*., II-II, question XLVII, article 10, reply obj. 2.

434 That nevertheless has to account the common good, otherwise being potentially deprived of its legitimacy.

precisely this feature of his theory – seeing the balance between the public and the private in their complementarity and interdependence – is most useful for the argument in favour of a broader access to remote sensing data, in particular privately generated.[435] The necessity to share and act not only in the name of the individual interest is an inherent to any property regime, be it common or private.

The concept of common property is primary and genuine for Aquinas based on his findings regarding what constitutes the common good that every society pursues. The explanation of this concept serves as both a foundation and a justification of the existence and primacy of common property over private property. Aquinas, as a Christian, believes that everything was given to the people by God, and therefore the use of the external things is not absolute, and must be governed by reason and used properly to meet owner's needs. From this a conclusion logically follows: the use of private property should be beneficial to the society, which originally had all the things in common property. Even if the premises of Aquinas' philosophy are considered not in their religious, but general ethical meaning, such a conclusion still remains viable.[436] Therefore, the heart of the explanation of why common property should exist and have primacy over private property lies in Aquinas' theory of the common good.

ii. Pursuit of the communal common good serves the individual

A state, according to Aquinas, has to approach the regulation of private ownership with the common good in mind.[437] First of all, as highlighted above, there is no private good without a "bigger" common good. Secondly, private property, as an institution, is set up by human laws that can only be legitimate and just when they are ordered or are ancillary to the common good.[438] In essence, the common good is something that

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435 The analysis in support of this argument is presented later in this chapter, but the most relevant points are highlighted as they come along.

436 And indeed in the context of applying the theory of common property to the modern "godless" or secularised society the connection to pagan Aristotle becomes rather useful.

437 Schlatter, R.*, supra* note 289, at 51.

438 *Summa Theologica*, *supra* note 405, I-II, question XCVI, article IV.

everyone in a society aspires to.[439] In order to be truly common it should not be directed to the restricted good of a particular societal group.[440] The common good, although communal, represents "an order of parts that explains and enables their coherence and activity without damaging their own internal integrity."[441] It is so, because for Aquinas, like for Aristotle, "when people act for ends as a community the good they pursue is a common one. Therefore, the pursuit of the common good has the same characteristics qua action as the pursuit of the good by individual persons."[442] This is possible because in any well-functioning community "every part has its own perfectly ordered place."[443]

Aquinas does not specifically define the common good, but he classifies common goods into three categories.[444] The first category includes abstract goods that are good for everyone because they reflect human nature and needs it stipulates, examples being knowledge, exercise, money and food. Regarding knowledge,[445] Aquinas believes that it is also instrumental to the common good: people seek it by possessing and applying knowledge and feeling love. For him, love helps to perceive something as good, whereas knowledge fosters the desire to achieve it, as it gives the people intellectual basis for the

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439 *Ibid*., article V and question XCII, article I. *See* also Hall J. ed., *Readings in Jurisprudence* (Indianapolis: The Bobbs-Merril Company Publishers, 1938) at 34.

440 *Cf.* Plato, *Laws* trans. Jowett, B. (Forgotten Books, 2008) at 123; Aristotle, *Politics* 3.7, supra note 20; Aquinas, T. *On Kingship*, 1.2, as cited in Lewis, V.B. "Common Good in Classical Political Philosophy" (November 2005) at 4. Online: <http://faculty.cua.edu/lewisb/Common%20Good3.pdf> (last accessed 01.02.2011).

441 *Summa Theologica*, *supra* note 405, II-II, question LVIII, article VI. *See* Lewis, *ibid*., at 5, where he highlights the discussion in Froelich, G. "Equivocal Status of *Bonum Commune*" (1989) 63 *The New Scholasticism* at 52-53, and Sherwin, M. O.P. "St. Thomas and the Common Good: The Theological Perspective: an Invitation to Dialogue" (1993) 70 *Angelicum* at 321-23: "One should note here that in concentrating on the political common good or even the common good that is other than specifically political I am concerned with the *temporal* common good. Aquinas was, of course, a theologian and was concerned first and foremost with the ultimate common good, God (*see* Sherwin at 308-14). The temporal common good is real for him, but is understood by analogy to the ultimate common good".

442 As per Lewis, V.B., *supra* note 440, at 16 and at 17, where he discusses the problem of the definition of the common good in an abstract way.

443 Summa Theologica, *supra* note 405, I-II, question XLIX, article III, r.

444 Froelich, G., *supra* note 441; also, Froelich, G. "Ultimate End and Common Good" (1993) 57 *Thomist* 609-19. *See* also Kossel, C.G. "Natural Law and Human Law (Ia II ae, qq 90-97)" in J. Pope, ed. *The Ethics of Aquinas* (Washington, D.C.: Georgetown University Press, 2002) 169.

445 Important for this analysis, as sharing, distribution and use of remote sensing data contributes to the generation of useful knowledge, and therefore, indirectly contributes to the achievement of the common good.

voluntary choice of the good.[446] The placement of knowledge into a category of the common good is particularly important for the argument regarding a broader access to remote sensing data and is returned to later in the chapter. The second category encompasses real goods that are commonly owned and enjoyed on the communal level, unless appropriated. The third category unites goods that can be common to real individual persons by causality: they "while remaining numerically one extend to many effects."[447] These goods are traditionally "sought 'final causes' in classical terminology."[448]

Happiness and knowledge are the key concepts that connect Aquinas' theory with the modernity. He places knowledge in the first category of the common good and thereby stresses its importance.[449] If these are the main values or aspirations of people in their search for the common good, Aquinas's philosophical thought does not need to be linked to his religious beliefs and teachings or time he worked in, as both happiness and knowledge are universal and common to people regardless of their religion or societies they live in. It is also important for remote sensing data, the essential purpose of which is to be shared, distributed and used to generate useful knowledge, and therefore to contribute to the achievement of the common good. The knowledge produced from remote sensing data is about the Earth: it can foster the understanding of what to do to make the planet "happy", to preserve life and prosperity on it.

In sum, the main arguments of Aquinas that are most useful for the argument of this research include primacy of common property over private, as well as of the common good over individual; necessity of a useful purpose for private property to be legitimate; common good as something that society pursues and its link to knowledge. The little

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[446] McDonald, H. "The Common Good" (May, 2000). Online: <http://www.vaxxine.com/hyoomik/aquinas/commongood.html> (last accessed 01.02.2011).

[447] Froelich, G. *supra* note 441, at 48.

[448] Lewis, V.B., *supra* note 440, at 4-5.

[449] Aquinas theory regarding knowledge or "scientia" is complex and influenced by the work of Aristotle, whereby knowledge can be perfect or practical, or as mentioned above the good in itself or instrumental to the achievement. This research though has no intention to go into the depth of the theory regarding knowledge. For an extensive analysis of the issue *see* Jenkins, J.I. *Knowledge and Faith in Thomas Aquinas* (Cambridge: Cambridge University Press, 1997); Finnis, J. *Natural Law and Natural Rights* (Oxford: Clarendon Press, 1999) at 59-81.

repetition is a helpful reminder for discovering and assessing the relevant arguments developed by Grotius.

b. Grotius' "right common to mankind" regarding property

In one of his most important lifetime works, Grotius had the aim to argue in favour of the freedom of high seas.[450] That is why the theory of common property developed before him by Aristotle and Aquinas was beneficial in substantiating his own. Being considered "the father" of the modern international law, Grotius introduced the concept of "international society" which binds states and their governments by the common rules and thereby turns them into a unified society or community.[451] He took the firm position that adherence to just laws and promotion of the "good of mankind"[452] would in the long run benefit individual members of international society.

With his law of peace, Grotius presented to the world the ideal conception of a "family of nations, united ... in a commonwealth of mankind".[453] With regard to property, the work of Grotius included property laws into the system of natural justice, which proves that he was influenced by the teachings of Aquinas and other philosophers who worked with natural law and applied some of the principles they elaborated to the new developments, in particular that of international trade.[454] With this in mind, it is time to turn to Grotius' understanding of the concepts of common property and the common good.

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450 *Mare Liberum*, *supra* note 406.

451 Bull, H. "The Importance of Grotius in the Study of International Relations," in Bull, H. *et al. Hugo Grotius and International Relations* (New York: Oxford University Press, 1990) 65-93.

452 Sotirovich, W. V. *Grotius' Universe: Divine Law and a Quest for Harmony* (New York: Vantage, 1978) at 33.

453 *Ibid*., at 85.

454 Reed, E. D. "Property Rights, Genes, and Common Good" (2006) 34:1 *JRE* 41–67.

i. One stock for common use and private property

Grotius acknowledges that the occupation can follow from different rights.[455] This premise results in the argument that, in accordance with the natural law based on the right reason, there is no difference between common use of things and private property: both of them are equally natural in the appropriate setting.[456] For Grotius, who takes the stance based on the rules adopted by the Code of Justinian, all things initially "formed a common stock for all mankind". Echoing Aquinas,[457] he says that at a later stage people started to use individually or consume things around them (from the common stock): a situation that subsequently led to the formation of the institute of private property. It served the primary purpose of justifying the "equal right to grab", which did not exist previously, and granted "a formal right of ownership to the first grabber".[458] This right in essence encompasses certain articles necessary to support human society, and life, as well as the general right of purchasing those articles at a reasonable price.[459]

It is important for Grotius, though, that when private property over things is established, the process itself and its outcome shall as closely as possible incorporate the original principles of natural equity[460] – a finding that again resembles Aquinas' stipulation that even use of things in private possession has to take into account the interest of the society on the whole. It is very likely, that for this reason the property right for Grotius is twofold: its private aspect establishes the advantage of each individual, and its communal ("superior") aspect authorises claims, "which the state has upon individuals, and their property, for the public good."[461] As the result, Grotius does not exclude use of privately owned things by people other than their owners. When stating that the case of necessity justifies the use of someone else's property, he is yet again very close to

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455 *The Rights of War and Peace*, *supra* note 406, Book III, Chapter XX, parts V, IX, XXI. (supra note)

456 Schlatter, R*., supra* note 289, at 127.

457 *Summa Theologica*, *supra* note 405, I-II, question XCV, article 5 obj. 3.

458 Schlatter, R*., supra* note 289, at 130.

459 *The Rights of War and Peace, supra* note 406, Book I, Chapter I, part X.

460 *Ibid*.

461 *Ibid.*, Book I, Chapter I, part VI.

Aquinas, with one main difference: Grotius stipulates that such behaviour should not be recognised as a right, but rather a permission that exists in and during the case of necessity.[462] At the same time he agrees that due to the fact that originally use of private property for general benefit was an integral part of the exercise of property rights,[463] such use should not be considered as prejudicial to the interest of the owner.

Within the discussion of the legitimacy of private property, Grotius explores the phenomenon of things that are "impossible to be reduced to a state of property".[464] Their most vivid example is the sea that should remain free for use by the international society. In arguing in favour of the freedom of sea Grotius resorts to the physical characteristics of this object, and stresses its vastness and even limitlessness that precludes anyone in particular from gaining possession over it.[465] This argument based on the features of a certain object is helpful in crossing the bridge between the necessity to keep the high seas free from possession on the one hand, and the recognition of the right to access remote sensing data on the other. The reason behind is that intangible data and information, and most importantly the ideas and facts they contain, as well as the knowledge that can be extracted from them, are very similar to the high seas in terms of vastness and (physical) inability of anyone in particular to fully own them. In addition, the parallel to the freedom of the high seas is helpful in development of the metaphor of information as a waterway that is introduced at the later stage of this research.

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462 *Ibid*.

463 *Ibid.*

464 *Ibid*., Book I, Chapter II, part III.

465 *Ibid*. *See* also *Mare Liberum*, *supra* note 406, Chapter 5: "the whole ocean, which antiquity calleth unmeasurable and infinite"; *see* also Arnand R.P. *Development of the Law of the Sea* (Dirdrecht: Martinus Nihoff Publishers, 1933) 78 ff.

ii. The good of the whole is comprised of individual parts

The theory related to the concept of the common good developed by Grotius is in general based on the premises similar to its foundation as per Aquinas:[466] the good of the society includes and therefore has primacy over the individual good. Unlike Aquinas, Grotius takes the position that both individual and the common good can be described as "one's own".[467] Such approach is dictated by nature, where something is good if it can be "reduced in the greatest possible degree to unity."[468] For Grotius, by analogy to nature, the unity connotes primarily identity and in the long run equivalence, "so that wherever the former quality cannot exist, the latter takes its place".[469]

The measure of good is the will and, taking into account the primacy of the community as described above and in connection with the common good, the will of the group is determinative and prevails over the good of individuals.[470] The communal and individual sides of the societal life, including property relations, are very much interwoven in the theory of Grotius, as according to his vision of the natural law "the preservation of each" is the prerequisite to the welfare of the whole.[471] This interconnection between private and public, individual and communal is also reflected in his property system. The latter is based on the principle of co-existence of private and common property, as well as on the premise that rights over privately owned objects should be exercised with the well-being of the society in mind. According to Grotius sociability among humans is one of the reasons why common and use rights were recognised in the first place.[472]

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466 *Summa Theologica*, supra note 405, II-II, question XXVI, article 4, ad 3.

467 *The Law of Prize and Booty*, *supra* note 406, Chapter II as part of explaining Rule V: "*Whatever the commonwealth has indicated to be its will, that is law for the individual citizens in their mutual relations*" whereby individual will influences the formation of the commonly applicable rules.

468 *Ibid*., Chapter II, Influence of Plato is traced in these theses of Grotius, who refers to Plato at the very least within this chapter.

469 *Ibid*., Chapter II.

470 *Ibid*., within the discussion of the common good as the purpose of creating societies and the commonwealth of citizens: "the will of the whole group prevails in regard to the common good, and even in regard to the good of individuals, in so far as the latter is subordinate to the former".

471 *The Rights of War and Peace*, *supra* note 406, Book I, Chapter I, part III.

472 Reed, E. D., supra note 454, note 11: "Grotius's position changed over the course of his career. In *The Law of Prize and Booty*, *supra* note 406, Book II, Chapter 2, part VI, he held that property rights in things consumed in a single use is natural but that property in other things, for instance fields or animals,

"Sociability" or "commonness" is a notion important to Grotius, and has a twofold societal effect. Firstly, it conveys the "common right to things," and secondly, "the common right to actions." The latter "is either absolute, or established by the supposition of a general agreement amongst mankind".[473] This division can be interpreted as giving the community the right to, for example, legislate in a way that improves the well-being of the whole – the society. Despite the fact that Grotius, unlike Aquinas, puts self-love as the first principle of natural law,[474] his vision of the society (both national and international) as a whole comprised of individual parts, reinforces the principle of sociability as a building block for setting up and maintaining social institutions.

As a result, the common good represents a mechanism that is used to avoid the *perpetuating* of property among individuals. At the same time, it prevents property transfer from hand to hand that may be detrimental to the well-being of the community as a whole.[475] Furthermore, Grotius advocates for a societal system that is based on the premise that moral laws apply to the individual and the state equally, with the aim of preserving peace and promoting the common good.[476] These arguments are to a certain degree reflected within modern laws, for instance the norms of copyright and other intellectual property protection regimes that stipulate instances of fair use or specify conditions under which a protected work is transferred into the public domain,[477] and can therefore find their application in the contemporary context.

As a result, the theory of Grotius has a great deal in common with that of Aquinas, but for Grotius both common and private forms of property are equally natural and legitimate. Despite this, Grotius argues that exercise of private property has to serve the

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exists by human law. By the time he wrote *On the Law of War and Peace* (1625), he had abandoned this distinction and appears to hold that all property exists by human agreement. In both texts, he recognizes a primitive "use right" that can be revived in situations of dire need."

473 Grotius, H. *The Rights of War and Peace*, *supra* note 406, Book II, Chapter II, part XVIII.

474 Reed, E. D., *supra* note 454, at 48.

475 Grotius, H. *The Rights of War and Peace*, supra note 406, Book II, Chapter III, part III.

476 Sotirovich, *supra* note 452, at 74-75.

477 In that that they seek to find the balance between the rights of owners of intellectual property assets and the needs of their users.

common good, the state being its guardian and promoter. The basis of the relationship between the common and the private and the cause of their interdependence is that the former, although when taken as such retains primacy, has to be reducible to "one's own", individual good. All in all, individual seems to have more importance for Grotius than it had for Aquinas. Hobbes' approach to common property and the common good entails some substantial differences as compared to both. His theory, to a certain extent, is even more interesting to explore, since the similarities that it nevertheless contains reinforce the validity and universality of the concepts of the common good and common property.

c. Hobbes' state of war mind and the vision of the common ownership

Thomas Hobbes was one of the first philosophers who developed a comprehensive theory of the origin of state based on the concept of the state of nature. The premises on which he builds it are very different from, or even opposite to those of Aquinas or Grotius: people are by nature in the state of war against each other, they compete with each other and everyone is seeking one's own victory and satisfaction of one's own needs and desires.[478] All this leads to violence and only a centralised state is able to bring people together and establish peace, which is otherwise not natural to them. There are three reasons for men to get together and conclude peace with each other: fear of death, desire to have decent life and hope. Reason is the governing principle in the state of peace. The system of natural law, according to Hobbes, is also very egocentric, as it is aimed at the achievement by each person of his desires, and is associated with freedom from any impositions from outside.

At first glance, the choice of Hobbes' theory is strange for the arguments that favour the common good as the foundation for property regimes. However, despite the very grim

[478] *Leviathan*, *supra* note 407, Chapter XI discussing desires; see also Chapter XV, in particular the 17th law "*No man is his own Judge*".

picture of the life of people in the state of nature, Hobbes does not deny that people can live in another state, and works with the concept of the civil society, where the power of the state is imposed on its members for the purpose of securing peace and promote prosperity. The principles that determine life in a civil society and help people avoid being enemies bring Hobbes closer to acceptance of interdependence of communal and individual interests in a society that theories of Aquinas and Grotius elaborated. Further analysis of the work of Hobbes related to the common property and the common good reveals more similarities to the premises and findings of the theories of other philosophers.

i. Consent over the division of the natural common stock

Hobbes recognises that initially there is a common stock of things, from which everyone can take as much as he wants or needs, for as long a time as he can keep it. An important detail of his theory that makes a difference in comparison to the other philosophers is that "in the common stock each man has the right not only to an equal share, but for the whole stock".[479] But, due to the assumption that the natural state of men is war, the "equal right to grab" from the common stock creates additional rivalry among them and is as a result, frustrating and unhappy.

Consistent with his initial premises, Hobbes concludes that people became rightful owners of the things from the common stock not naturally, but because of the consent: people wilfully divide the common stock that initially was provided for by nature.[480] This consent is safeguarded and enforced by the state that people create to avoid the natural state of war. The role of state essentially means that property is one of the results of its creation, because "without statute-laws men have the right to all things".[481] The rights over appropriated property are not absolute, as according to Hobbesian twelfth law of nature resources should be shared equally among all those

479 Schlatter, R., *supra* note 289, at 139.
480 *Ibid*., at 138.
481 *The English Works*, *supra* note 407, at 29.

who have the right to use them. This principle links the division and exercise of private property rights to the initial common stock that existed before their recognition by the state. Another limitation that Hobbes introduces is that as the state is created by consent and the property rights are transferred to the sovereign, who can affect or alter the rights of property owners by, say, changing the relevant legal regime.

An interesting, if not confusing, point in Hobbes' theory is that, although he denies the natural existence of property as an institution, he does not deny the equality of men. Moreover, he argues that the ideal state has to protect this natural equality ... *and* private property. This poses a question of whether there is a temporal clash between the emergence of property and the state: on the one hand property as entitlement emerges only when the state is created by a convention, but on the other hand system of ownership determines the system of government,[482] the purpose of which is to "to prevent ... changes in the distribution of property which overthrow the "balance" and result in political revolutions".[483]

Setting aside the issue of the primacy of private property or the state, and the confusion as to whether the state has the obligation to recognise property rights or the right to establish and distribute them, the approach to the actual exercise of property rights taken by Hobbes is surprisingly similar to those developed by Aquinas and Grotius. Hobbes argues that sharing of property, or at least of its fruits, is essential for the communal life. His concept of sharing includes distribution of and transfer of property rights over excessively produced things by exchange, and mutual contract: "and for the matter, and distribution of the nourishment, to the several members of the commonwealth, thus much (considering the model of the whole work) is sufficient."[484]

Neither common nor private forms of property are initial according to the theory developed by Hobbes. Although his discussion regarding private property is much

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[482] Which results in the situation where the state has the authority only to recognise property rights as they existed before it was created, but not to actually distribute them.

[483] Schlatter, R., *supra* note 289, at 143.

[484] *Leviathan*, *supra* note 407, Chapter XXIV, within the discussion of the issue that "the Laws of transferring property belong also to Sovereign."

broader and has more details to it than does his discussion of common property, there are certain aspects regarding the exercise of private property that bring Hobbesian regime close to that developed by Aquinas and Grotius. His findings regarding the common good reinforce the universal character of the criteria that should be applied to determine legitimacy of laws. Reiteration by Hobbes of the necessity or the obligation to share as the foundation for any property regime when applied to the subject-matter of this research supports the argument that even privately generated remote sensing data should not be locked-up as a result of the decisions reflecting only the interests of their owners.

ii. Peace and mutual respect as overarching common societal interests

Hobbes stresses that despite the state of war or hostility natural to men, the "commonwealth", formed as the result of the consent among the people, has to be sustained. To achieve this, private property and exercise of rights over it is not enough. Hobbes formulates the principles governing life in a civil society in the laws of nature that have to be respected and reinforced by all subsequent regulations that a society adopts through its government. The first two laws of nature, according to Hobbes, are the most fundamental in stipulating that each person should seek to live with others in peace. The first law of any civil society is the achievement and maintenance of peace and security in order to secure enjoyment of the freedom initially given to them. The second law of nature prescribes that each person should only retain the right to as much liberty as he or she is willing to allow to others and therefore treat each other with mutual respect.[485] These natural laws may be known by reasoning and aim at lowering the fear of death and increasing the level of life of every individual in the society – concepts that can be considered the common good.

As with other philosophers, it is often difficult to separate thoughts of Hobbes regarding common property and the common good. In addition, on the very rare occasions where

[485] *Leviathan*, *supra* note 407, Chapter XIV.

Hobbes is actually using the term "the common good" he addresses the issue of the allocation of property and the division of land. The first law gives the sovereign, and only him the authority to assign "to every man a portion, according as he ... shall judge *agreeable to equity, and the common good*."[486] In addition to the first two laws, there are others that regulate in greater detail how the goods of the first two have to be achieved. The fourth, the fifth and the tenth law that govern Hobbesian civil society entail important elements of what can be seen as the common good: they stipulate the appreciation of the good will of others,[487] the reasonable accommodation of oneself to others,[488] and the equal right to liberty and well-being.

Peace and security for Hobbes are treated as the common good that can only be achieved if a state is established, passes its laws and introduces mechanisms of their enforcement. Hobbes declares that natural laws are also moral laws. These laws have to be based on "equity, justice, mercy, humility, and other moral virtues".[489] Furthermore, the achievement of the communal welfare is reached only through the inner consent (agreement) of the commonwealth members. These premises are not that different from those used today, for instance the laws that contain the norms that recognise the right of access to public sector information as discussed in the previous chapter.

Hobbes does not as clearly bring up the concept of the common good as does Aquinas or Grotius, but using other notions he still turns to the concepts of justice, equity, communality within the state created by a covenant among people, and brings values of the newly created entity to the forefront. Although he firmly supports the supremacy of the individual welfare, he admits that there still has to be mutual respect among the members of the community, as the achievement of peace and security for one private

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[486] I*bid*., Chapter XXIV: "All private Estates of land proceed originally from the arbitrary Distribution of the Sovereign".

[487] *Ibid*., Chapter XV: the fourth law of nature is that each person who benefits from the good will of another person should respond appropriately to that person's good will, and should not act in such a way as to cause that person to regret having acted in good will.

[488] *Ibid*., Chapter XV: the fifth law of nature is that each person should reasonably try to accommodate himself or herself to other persons.

[489] *Ibid*., Chapter XV, stating that the science of the laws of nature "is the true Moral Philosophy".

member of the state is impossible without the sustained peace within the community.[490]

As the result, Hobbes' approach with regard to the common good resembles that for the property regime: both common and private property is a creation of the state, and therefore secondary to the common stock that existed before the creation of the state. By the same token, the common good of peace and security can only be achieved if safeguarded by the state, as initially the individual good of people in war with each other prevails. This is quite different from Aquinas for whom the common good is given to the people before the state is established and in fact governs the activities of the state and its lawmaking, as well as from Grotius who saw the manifestation of the communal will as primary to individual. Nevertheless, his different approach reinforces the application of the theories of the common good and common property, as Hobbes also emphasises the importance of sharing that enhances the well-being of the society, as agreed in the contract establishing the state. Whether sharing plays any role in the property theory of Pufendorf remains to be seen over the next pages.

d. Pufendorf's *res nullius* and *res communis*

Samuel von Pufendorf develops his theory upon the theories of Grotius and Hobbes, and since he was a (German) lawyer his ideas regarding common property and the common good, and in particular their formulation, are useful for the present analysis.[491] To begin with, he asserts, contrary to Hobbes and in accord with Grotius, that people are sociable creatures and that the state of war is not natural to them. Nevertheless, the

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490 *Ibid*., Chapter XI, on the differences of manners.

491 Particularly taking into account the influence of the civil law system and the German contribution to it on the European and EU law. Also, Pufendorf influenced quite substantially the work of Locke, this being yet another reason not to include the latter's theories in the present research. *See* e.g. in *Two Treatises of Government*, *supra* note 409, note at 88.

initial state of peace is very fragile and not secured. To enforce the obligation to follow the laws of peaceful coexistence the state is made by consent among the people.[492]

Pufendorf defends the idea that international law is not restricted to Christendom, but constitutes a common bond between all nations because together they form humanity.[493] Based on this premise, he develops the notions of common property and the common good, and therefore does not limit their foundations to the Christian values only. The analysis of the milestones of his theory helps to cross the bridge from the philosophers whose (Christianity-based) theories were analysed earlier and the modernity that is "free" from any religious postulates of the past. The analysis shows that the values underlying the common good are the same or very similar for Christians and people of other confessions or atheists, and that as a result this theory and the principles it is based on should not have applicability problems nowadays just due to the fact that its core was developed mostly by Christian philosophers of Europe.

i. Primacy of the "never owned" negative community

Pufendorf's theory of the formation of the institute of property is based on the existence of negative and positive community.[494] The negative community – *res nullius* – contains things that initially do not belong to anyone,[495] and it is open to everyone for use and appropriation. Because the natural community is negative, an agreement extinguishing any rights therein is unnecessary; instead, the possessors have to show that their rights have a natural origin and thereby obligate others to respect their

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[492] *The Whole Duty of Man*, *supra* note 408, Book Ii, Chapter V, sec. I, III, VII.

[493] *Encyclopaedia Britannica* (1911). Online: <http://www.1911encyclopedia.org/Samuel_Pufendorf> (last accessed 01.02.2011).

[494] *The Law of Nature and of Nations*, *supra* note 408, Book IV. Chapter IV at 532-533. *See* also Garnsey, P. *Thinking about Property: From Antiquity to the Age of Revolution* (Cambridge University Press: 2007) at 115-116.

[495] *The Law of Nature and of Nations*, *ibid.*, Book IV. Chapter IV at 532-533 at 545-46 and at 550 on the initial absence of the dominion. (supra note) In this he is pretty much the same as Grotius and Hobbes, but not Aquinas: "things were created neither proper nor common (in positive community)."

property rights.[496] Both private and communal property is created later on by men due to the fact that negative community itself is unstable.[497]

"Positive community" means for Pufendorf a property regime opposite to private property: common property over things shared by a community of people. Therefore, for Pufendorf, as for Grotius or Hobbes, both positive community and private property are secondary to the negative community of things that do not belong to anyone. Consequently, according to his formulation, any type of property logically implies exclusion: within common property it is a limited group of owners that is allowed to exercise the rights over it, whereas in case of private possession only the owner himself is entitled to determine the fate of his property.[498] Following Grotius, Pufendorf recognises that there are certain objects that cannot be owned either individually or collectively (by a group): "*some Things may, and some Things ought to continue, as at the Beginning, common to all*."[499]

The scenario of ultimately communal ownership is possible due to the fact that the negative community of things has precedence over any type of property introduced later on, as it reflects the "state of mankind", for which possession of everything is not necessary.[500] This principle concerns first of all inexhaustible things, appropriation of which would be nothing else but purposeless and "foolish". To illustrate what objects can only be in the communal property and belongs to the international community as a whole Pufendorf invokes, just like Grotius, the example of the high seas. Since this finding is based on the particular characteristics of such objects,[501] it can be used by analogy to apply to the regime of ownership and use of remote sensing data and information. This regime has to satisfy the conditions of the legitimacy applicable to any

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496 Schlatter, R., *supra* note 289, at 149.

497 Garnsey, P.*, supra* note 494, at 117.

498 Kilcullen, J. "The Origin of Property: Ockham, Grotius, Pufendorf, and Some Others" (2001). Online: <http://www.humanities.mq.edu.au/Ockham/wprop.html> (last accessed 01.02.2011).

499 *The Whole Duty of Man*, *supra* note 408, Book I, Chapter XII, sec. 4. This is one of the most important findings for arguing in favour of a broader access to remote sensing data.

500 *Ibid*., Book I, Chapter XII, sec. 4.

501 They are very similar to those formulated by Grotius.

form of property over objects taken from the negative community. Such primary condition, as developed by Pufendorf, is the purpose of ownership.

Pufendorf, as the other philosophers, considers private property as legitimate when and if it has a particular purpose. For him it is the preservation of human life. In addition to the purpose, a property regime should be set up in such a way as to support peaceful social life and serve communal interests of the society as a whole.[502] Consequently, the principle that a property regime should exist for societal purposes legitimises limitations of the extent to which either private or communal property rights may be exercised in favour of the society as a whole. As a result, the limitations are an integral part of the overall property regime. Pufendorf's important conclusion supports the argument brought forward in this research: broader access to remote sensing data should be recognised and promoted by the governments notwithstanding the form of property over the source of their generation because there is a good enough purpose to do this, namely – improvement of the societal life.

In continuity with the theories of previous philosophers Pufendorf addresses the issue of the balance between the private and communal and their places in the life of a society. His work crystallises another important aspect that is common to the philosophers whose works are analysed in this research – the issues of property and the common good are very much related to each other and the core principles and features embedded in one influence the other. The concept of the societal purpose plays an important role in the discourse regarding the recognition of property rights and their enforcement. Because the concept of social purpose brings forward the well-being of the whole, it makes the analysis regarding the legitimacy and functioning of the institution of property dependent on the satisfaction of the requirements set out by the concept of the common good. As the result, Pufendorf, probably to a greater extent than the other philosophers, argues for the recognition of the authenticity of the link between the two concepts.

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[502] Summarised by Buckle, S. *Natural Law and the Theory of Property: Grotius to Hume* (Oxford: Clarendon Press, 1991) at 91-92.

ii. Self-preservation should not disturb the society

Pufendorf associates the notion of the common good with the concept of the natural law that has a twofold purpose: to obligate the individual will on the one hand and to promote the good of humankind on the other. As a result, the principles of self-preservation and sociality co-exist in a framework where everyone has "to modify his care for himself as not to become himself unsociable with others, or not to have society among men disturbed".[503] In the light of this statement Pufendorf concludes that the state should preserve the natural equality of men, and being bound by the natural law is not allowed to grant monopolies and special privileges.[504] Such an approach to the purpose of the state signifies that the government is entitled to limit property rights so that they serve a purpose useful for the society as a whole, but are not recognised solely for the sake of their existence or the individual/communal well-being of their owner(s).[505]

Community is an important and powerful entity and according to the will of nature represents a "kindred amongst all mankind."[506] Due to these characteristics people have an obligation to assist and to contribute to the benefit of each other.[507] Interdependence of the members of the community and latter's great role in their life also explains the impossibility of self-preservation without taking into account interests of the society. This premise is similar to the arguments regarding the necessity of cooperation between the individual and the whole for the purpose of achieving the common good of better life brought forward by Aquinas and Grotius, and to a certain extent by Hobbes. The importance of the community as such and of its welfare is

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503 *Two Books of the Elements of Universal Jurisprudence*, *supra* note 408, Book li, Observation IV, section 1. *See* also Carr, C. L. & Seidler, M. J. "Pufendorf, Sociality and the Modern State" (1996) 17 *History of Political Thought* 354 in Haakonssen, K. ed., *Grotius*, *Pufendorf and Modern Natural Law* (Dartmouth: Ashgate 1999).

504 Schlatter, R., *supra* note 289, at 148. Such argumentation supports the thesis of inapplicability of natural property theory to IP.

505 This is yet another similarity with the others.

506 *The Whole Duty of Man*, *supra* note 408, Book li, Chapter I, sec. X, L.N.N.I.1. c. 3. §4.

507 *Ibid*.

emphasised through the ways property should be used: disposal of things has to be governed by the principles of the preservation of peace, "tranquillity and good order in the world".[508] Such exercise of property rights reinforces the legitimacy of their limitation "by granting some rights to others, which is done by the government or through contracts among men,"[509] and is in accord with the vision of relationships regarding execution of property rights that other philosophers elaborated upon.

Pufendorf does not provide a lot of details as to what the interests of a society are or should be. Nevertheless, he clearly agrees that they can be of non-utilitarian nature (nod to Aquinas, Grotius and Hobbes) when he includes preservation of peace and maintenance of good order in the world into the system of principles that determine the life of the society, and subsequently the property regimes established by its government. This observation supports the argument that existence and effectiveness of legal norms does not depend on whether they have a very practical basis or favour profit-making or economic goals. In fact, Pufendorf agrees that such norms need to incorporate mechanisms that promote and reinforce not easily reachable, but yet not in the least less valued principles of peace, security and prosperity. These principles have equal, if not greater, influence as to what a legal norm should protect, promote or limit, including establishment of property relationships. The argument that this can be still regarded as a truthful statement in the modern realities and that non-utilitarian goals and aims should govern shaping of the regime of access to and protection of remote sensing data is supported by the findings and arguments of James Boyle discussed over the next pages.[510]

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508 *Ibid*., Book l, Chapter XII, sec. II, L.N.N.l.4.c.4.§5.

509 *Ibid.*, comment to L.N.N.l.4.c.4.§5.

510 Locke was substantially influenced by Pufendorf, as Tully and Buckle point out. *See* Tully, J. *A Discourse on Property: John Locke and his Adversaries* (Cambridge: Cambridge University Press, 1980); Buckle, S., *supra* note 502.

e. Boyle's creative commons

Due to the limited scope of research it is impossible to bring forward the arguments and works of a lot of philosophers who dealt with the concepts of the common good and common property. That is why the whole transformation period of the enlightenment era that gave rise to the importance of individual rights, and led to the diminishing of the importance of common property[511] is not subject of the present analysis. Despite the dominance of personhood-oriented thinking and philosophy, some continuity can be seen in the works of Locke as mentioned earlier. The doctrine of public trust[512] represents another development that shows relevance of the theories of common property and the common good through time. It finds its regulatory roots in the Code of Justinian[513] and British common law,[514] but was formulated as a concept similar to that used for the past century or so in the US.[515] It was most often applied to govern the use of land and natural resources, whereby public rights of access to such resources as navigable waters could not be affected by ownership rights over them.[516]

Nevertheless, the theories of the past need a reality check: understanding of the common good and common property and their relationship to private property as developed by Aquinas, Grotius, Hobbes and Pufendorf can only be linked to the modern context, if their ideas still find a reflection, support and further elaboration in the modern philosophical thought. For this purpose and in order to provide for a better link of the theories of common property and the common good to intellectual property

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511 This concerns in particular the enclosure movement of the XVIII century regarding privatisation of the commonly owned lands in England and other countries. For basic overview and potential relevance for the development of intellectual propertyprotection regimes *see The Public Domain*, *supra* note 410, at 43-45, 264.

512 It is also mentioned in the next chapter in connection to the regime of access to waterways.

513 Note that Grotius was also influenced by the Code.

514 Dick Howard, A.E. *Magna Carta: Text and Commentary* (Charlottesville: the University Press of Virginia, 1998), chapter 33 with regard to navigable waters.

515 *Illinois Central Road v. Illinois*, 146 US 387.

516 Simmons, R.T. "Property and the Public Trust Doctrine" in *Property and Environment Research Center Policy Series* 9 (March, 2007) at 9. Online: <http://www.perc.org/files/ps39new.pdf> (last accessed 01.02.2011). Note that the author argues that all conventionally accpeted sources that support traditional interpretation of the public trust doctrine are not necessarily the best ones.

assets, the research of James Boyle is chosen.[517] This scholar contributes to the discourse of the public domain, as well as the legitimacy and justification of intellectual property rights. The analysis of his ideas serves two goals: firstly, to show that the existence of the public domain is driven by the principles of the theories of common property and the common good; and secondly, to see how important it is for intellectual property regulations to rest on the principle of sharing – the core element of the theories of the common good and common property and the rules on the use of assets they underlie.

To bridge the gap between the reasoning in favour of existence of common property with regard to tangible and intangible objects Boyle operates with the "second enclosure" metaphor – privatisation of intangible goods and information – and describes it as a contemporary trend resembling privatisation of the commonly owned land (enclosure) in England and other European countries in the past. Thereby the thinker implies the applicability of the theories regarding tangible property to subject-matter protected by intellectual property laws. Furthermore, Boyle builds up his arguments in favour of a broader access to copyrighted works using notions and principles very similar to those elaborated by the philosophers from the past with regard to the concepts of the common good and common property and their influence on the understanding and allocation of private property rights.

i. Public domain as common property

Boyle neither directly works with the concept of common property, nor engages in the discussion of the origins of property rights, as well as of the primacy of a particular form of property over others. Nevertheless, he brings forward and supports the necessity of

[517] He is by no means the only scholar working on the issue of proper copyright protection regime and the public domain. For other insights contributing to the discourse *see* e.g. Lange, D. „Recognizing the Public Domain (1981) 44 *Law & Contemporary Probs*. 4, 147; Litman, J. The Public Domain (1990) *Emory Law Journal* 39, 965; Lessig, L. Free Culture: the Nature and Future of Creativity (New York: The Penguin Press, 2004); Guibault, L. & Hugenholtz, B. eds., *The Future of the Public Domain: Identifying the Commons in Information Law* (Alphen aan den Rijn: Kluwer Law International, 2006).

existence of the public domain and the commons – the two regimes that are inherently similar to that of common or shared property. Both of them govern use of intellectual property assets and are based on the principle of accessibility of copyrightable material. The premise for such a similarity according to Boyle lies in the direct analogy to the regulatory framework regarding property rights over tangible objects: these rights cannot be absolute and their use and exploitation is normally limited through exceptions driven by the interests of the society as a whole. Already here he is in accord with the other philosophers who limit the scope of property rights by the purpose of their existence – a purpose that has to reflect and reinforce the goals of societal existence. It follows that intellectual *property* rights as well cannot be totally exclusive. In this regard the concepts of the public domain and the commons[518] contribute to the balance of interests of rightholders and users of works by setting conditions that enable access to and use rights over protected subject-matter.[519]

Boyle separates the notion of the public domain from that of the commons in that the latter represents a "territory" where certain rights over the intellectual property assets exist, but they do not prevent their users from wide access to and utilisation of objects that populate it. In the contemporary environment of ever expanding intellectual property rights commons represent an alternative regime, whereby the authors or rightholders voluntarily refuse from having unlimited or marginally limited rights over their assets in order to provide others with the opportunity to re-use the works they own.[520] Therefore, commons can be created privately, as in the case of, for example, open-source software. Such understanding of the commons brings Boyle close to the concept of common property elaborated upon by Aquinas and other philosophers, whose works were analysed previously. The similarity is most vividly seen in the "private in possession – common in use" principle that is particularly well formulated by Aquinas

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[518] Alongside other exceptions and limitations of intellectual property rights that relevant regulations may stipulate.

[519] *The Public Domain*, *supra* note 410, at 39.

[520] *Ibid*., at 65 ff. This is a reflection of Boyle's thesis that „the holes matter as much as the cheese," whereby the limitations to and exceptions from intellectual property rights are as important for a coherent regime regarding intangible assets as rights of authors.

and Grotius.[521] But not everyone interprets commons the way Boyle sees them, and some understand, for instance, the commons with regard to the internet as containing the elements of the negative community as seen by Pufendorf.[522] For Boyle, however, it is rather the public domain that resembles the *res nullius*.

The difference of the public domain from the commons lies in its interpretation as a "space" where intellectual property rights[523] do not apply to the intangible objects at all: either because the protection has expired or because the objects were never owned.[524] The public domain, similarly to the commons,[525] is a regime that is created to oppose the logic of control when regulating the issues of access to and use of intellectual property assets. The emphasis on sharing and use, rather than the rights of the owner alone, better reflects the nature of intellectual property assets and recognises the importance of access rights for creation of new works.[526] It is also true for the creation of information products, especially from remote sensing data: it is impossible to produce and sustain, for instance, a GIS that provides spatially referenced information for a lot of different applications without having access to remote sensing data, whether primary or processed, as well as other types of data and information.[527]

Boyle stresses that development and preservation of the public domain is natural to the overall regime of intellectual property protection. One of the major arguments in favour of this characteristic of the public domain is that the underpinning of its existence is a trade-off in the bargain for establishing the protection of works: society has to be rewarded with access to the public domain for its consent to grant intellectual property

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521 The latter with regard to the freedom of high seas.

522 *See* e.g. Felsenstein, L. "The Commons of Information" (May 1993) *Dr. Dobbs Journal* 18-24.

523 Apart from the moral rights of authors, which are not limited in time but in any case do not limit the ability to use the work.

524 *The Public Domain*, *supra* note 410, at 38.

525 Since the regimes have more similarities than differences, it is legitimate to categorize both of them as representing regimes opposed to that of private property.

526 *See* Besser, H. "Commodification of Culture Harms Creators" (Paper presented at the American Library Association retreat on Information Commons, 2001). Online: <http://www.gseis.ucla.edu/~howard/Copyright/ala-commons.html> (last accessed 01.02.2011).

527 Next chapter explores GIS in detail.

rights as incentives for authors to create more works in the future.[528] The public domain is an integral part of the system of copyright protection[529] and completes it by giving the potential authors food for thought, or as in case with remote sensing data – the actual raw material, *necessary* to create new works. Alongside this practical purpose of its existence, the public domain reflects one of the characteristics of the human nature – that of sharing.[530] This brings us back to the very foundations of the theories of the common good and common property that require sharing in the view that individual well-being is only possible in conjunction with that of society as a whole, also in the context of allocating private property rights.

Boyle gives examples from the artistic, literary and world-wide-web worlds to prove that sharing is,[531] or at least used to be, very natural and normal to people who create works protected by intellectual property regime. In doing so, he confirms the way of thinking of other philosophers, as he interconnects property regime with the values that underlie the societal life and are dictated by the goals of its existence. He also emphasises that the effectiveness of the former very much depends on whether it reflects or incorporates the latter. If this is the case, then for Boyle sharing that leads to creativity is an example of the common good, and the existence, preservation and enhancement of the public domain supports it.

ii. Creativity as a common good

The public domain exists on the one hand in opposition to the rights granted to authors and other rightholders of copyrighted materials in that it secures access to the works for the users. On the other hand – naturally rather than paradoxically – it complements

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528 *See* Litman J., *supra* note 517, at 965 with reference to *Sony Corp. v. Universal City Studios*, 464 U.S. 417, 429 (1984); Patterson, L. & Joyce, C. "Monopolizing the Law: The Scope of Copyright Protection for Law Reports and Statutory Compilations" (1989) 36 *UCLA L.Rev.* at 790-791.

529 Saying that copyright and public domain are born together Boyle quotes Rose, M. "Nine Tenths of the Law: the English Copyright Debates and the Rhetoric of the Public Domain" (2003) 66 *Law & Contemp. Probs*. at 76.

530 Boyle refers to it as to „some bizarre love of sharing," *The Public Domain*, *supra* note 410, at 81.

531 *Ibid*., "I got a Mashup" chapter.

intellectual property rights since by taking from the public domain one can become an author and exercise the rights that the copyright law regime grants to authors of protected works.[532] For Boyle, the intellectual property protection regime is neither complete nor, most importantly, legitimate without the public domain. His position emphasises that intellectual property rights are limited by nature, regardless of the theory that justifies their existence. In this he is not different from Aquinas or any other of the philosophers discussed above, who argued that property rights, whether common or private, have to be limited by the purpose of their existence. The similarity of assessment is achieved even without Boyle referring to their works, as in order to support the view that intellectual property rights are limited in nature[533] and should never become monopolies,[534] he mentions Jefferson, Locke and the French (post) Revolution theorists. The primary reason why intellectual property rights and property rights over tangible objects respectively need limitations, as agreed by all the thinkers, is that leaving their exercise at the sole discretion of the owners would not be consistent with the common good of a society.

For Boyle, creativity[535] that largely depends on the ability to access the works of others should be regarded as the common good.[536] Copyright, as a regulatory regime that seeks to find the balance between private and public interests, protects the latter[537] by ensuring that the public retains certain rights regarding use of protected works for its willingness to grant rights to their authors.[538] This is the illustration of how a mechanism of reaching the common good – serving a purpose beneficial for society – is inbuilt in the intellectual property in general and copyright protection regime in particular. With this in mind, Boyle considers the trend of commodifying works of authorship and enclosing

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[532] Here again one can clearly see the interrelation of the private and public and the interdependence of the well-being and happiness of one very much on the other.

[533] *The Public Domain*, *supra* note 410, at 29.

[534] Because in this case they would go beyond even the utilitarian purposes they are supposed to serve.

[535] It should be noted that creativity is inter-connected with other valuable aspects that IP protection is supposed to achieve, like free speech, scientific progress, innovation.

[536] *The Public Domain*, *supra* note 410 at 40, 68.

[537] Read “public good”.

[538] Besser, H., *supra* note 526.

them as not natural to the copyright regime, because these actions are dictated by the needs of some of the market players (read private utilitarian interests) and in the long run lead to the reduction of sharing and creativity that copyright regime is supposed to safeguard. Such scenario develops under the circumstances where the common good and its achievement are set aside.[539]

One of the most important assertions that Boyle is never tired to emphasise is that a copyright regulation can only be balanced if there is an agreed understanding of the common interest that all sides or participants of the relations regarding intellectual property rights and assets adopt in their behaviour.[540] The underlying idea behind it is the same as for other philosophers – one cannot declare or grant rights just for the sake of their existence. They have to serve societal purpose. Such thinking represents a reflection on the idea of the common good, and Boyle believes that seemingly different interests of copyright owners and users are united by "ideas of the protection of the public domain and of the importance of a balance between protection and freedom in cultural and scientific ecology."[541]

2. Sharing and the common good

All of the authors whose work regarding the theories of common property and the common good were discussed previously in this chapter support the existence of the concept of the common property, be it Aquinas' common property of the few, Grotius' freedom of high seas, or in some cases even something to which any notion of ownership is not applicable, as in case with Pufendorf's negative community. Aquinas, Grotius, Hobbes, Pufendorf and Boyle support the legitimacy of the existence of common property in general – for certain scenarios they view its regime regarding property rights over both tangible and intangible objects as the best suited to reinforce.

539 *The Public Domain*, *supra* note 410, at 40.
540 *Ibid*., at 239.
541 *Ibid*., at 244-45.

The reason behind i is that this regime reinforces the common good.[542] The principle upon which it rests is sharing that in its turn contributes to unification of individual and communal interests and emphasises their interdependence. None of the philosophers negates the existence of private property, but each of them identifies the notion of the common good and the principle of sharing that it stipulates as the criterion to determine the legitimacy of private property rights. Following this logic, the return to or restoration and preservation of the principle of sharing characteristic to both common and private property and its incorporation into the regime of intellectual property protection, in particular with regard to access to and use of remote sensing data, should be a goal to pursue. Such an approach aims at improving the life of the society – the common good – by reconciling different interests of its various members and thus providing it with valuable information and ultimately knowledge.[543]

The common good underlies the existence of the society and fosters its development; it encompasses peace and prosperity of the whole and well-being and creativity of the individual. The assumption of the commonality of people's desires, as well as of the necessity to share and to help each other in order to achieve a prosperous society also unites the theories of the philosophers. Most importantly, they emphasise that individual happiness is not possible without taking into account the interests of the society on the whole and without contributing to their achievement when serving own personal needs. Neither the private owner of a piece of land nor the copyright holder can make the best out of their possessions if they do not take into account the rights and interests of non-owners.[544] Such a viewpoint is logical since if, for instance users of copyrighted material will not have enough room – in the form of exceptions to the rights of authors and other rightholders or the ability to access works in the public domain – to utilise it, they may refuse from acquiring protected objects altogether: an act that will

542 As for example the high seas for Grotius and the public domain for Boyle.

543 Or increase happiness, as Hume and utilitarians would say.

544 One of the consequences of such practice in the area of remote sensing activities, in particular in the secondary market of value-adding activities, is that the users may in the long run refuse to deal with the owners of remote sensing data, if the conditions of their use are entirely unacceptable for them. This would of course harm the generators of remote sensing data, since they would no longer be able to distribute the data effectively.

lead to reduction of economic benefits that the copyright holders can enjoy in case some degree of sharing is accepted as a rule.

These premises enable to establish the link between the theory of the common good and common property and the right of access to remote sensing data. For a clearer comparison the commonalities on the thinking of the philosophers exploring this issue is analysed separately for common property, the common good and their implications with regard to the characteristics and scope of private property rights. The table below summarises main similarities and differences in philosophers' views regarding common property, private property and the common good, and may be a helpful reference for the reading of this section.

2-2 Similarities and differences in philosophers' views regarding common property, private property and the common good

	Aquinas	Grotius	Hobbes	Pufendorf	Boyle

Common property	- universal community of all property - some things always common, but restricted to the few	- initial common stock for all mankind - some things always common	- initial common stock: free to take from by anyone as much as one wants - state creation	- initial negative community: "no man's land" - common property: positive, secondary community - some things always common	- the public domain: no IPRs - the commons: limited rights and wide range of allowed uses - some things always common (ideas)
	Aquinas	**Grotius**	**Hobbes**	**Pufendorf**	**Boyle**
Private property	- secondary, created by human law - for the benefit of human life - ownership-use dichotomy	- equally natural to common - natural equity in distribution - exercise for the purpose created	- state creation - equity and the common good in distribution - no absolute impropriations	- secondary to the negative community - to serve communal interests of the society, a useful purpose	- always limited, allowing use by others - reward for creativity - should come back to the public domain

The common good	- primacy over individual good - sharing - knowledge	- reducible to "one's own" good - sharing - promotion of the good of mankind	- stems from individual - sharing - limitation of egocentricity	- co-existence of private and public good - sharing - same common good for all nations as humanity	- creativity - sharing - private cannot be achieved without satisfaction of the common good/interest

a. Legitimacy of common property

All the philosophers, expressly or in an implied manner, argue that originally there was no private property, but a common stock of things available for use or appropriation by everyone in the community.[545] There are differences among their theories regarding formation of the notion of both common[546] and private[547] property, but the natural character of common property is supported by each of the thinkers. Moreover, although not questioning the existence and legitimacy of private property all authors maintain that its allocation should be governed by the idea of the common good, which reflects some universal principles, like moral virtues or equity. Another important aspect of property theories developed by these authors namely, in the formulation of Aquinas, who very closely follows that of Aristotle, the "ownership-use" dichotomy influences the modes in which private property rights are exercised.[548] This dichotomy flows from the acceptance of private property and the legitimacy of its existence on the one hand, and the recognition of a synergy between individual and communal well-being and happiness on the other. As a result it abides the owner of private property to use it not only to meet his individual interests, but also for the benefit of the society as a whole.[549]

Application of the common good and common property theories to determine the legitimacy of private property and the proper way of its use best reflects the main proposition of this research regarding wider access to remote sensing data. The data do not have to be denied copyright or other suitable forms of protection in cases where such protection is appropriate. What is important is that the rules governing distribution

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[545] The notion of community may differ in different theories, though, but not too drastically

[546] As initially existing according to Aquinas, but *e.g.* secondary to the negative community in the theory of Pufendorf.

[547] Purely secondary (with regard to common property) for Aquinas, but *e.g.* equally natural to common property for Grotius.

[548] Which again is developed by other thinkers as well. *See e.g.* application of the second natural law formulated by Hobbes (to leave oneself as much liberty as one is willing to grant to others) with regard to property and exercise of property rights.

[549] This reflects how much influence on each other the concepts of common property and the common good have. See further discussion in Lametti, D. "The Objects of Virtue", *supra* note 20.

and use of data so protected should better incorporate the interests of the users, particularly because use of such data and information they contain can be of great value to the whole society, and in fact these uses raise their value in return. Furthermore, the premise that greater societal good and interests should guide distribution and use of remote sensing data that are privately owned is supported by the following: their technical characteristics, applications for which they can be used, the benefits that can be brought to the society by those uses, as well as the contemporary reality of human kind entering the age of information society.

Boyle's work best shows the way the theory of common property can be applied to intangible assets, including remote sensing data. Firstly, he asserts that based on the historical development of the law the public domain represents an integral part of the intellectual property or copyright law regime and therefore is as natural a component of the system of protection, as the rights of authors. Secondly, while explaining the reasons for such interpretation he argues, in line with other philosophers that, as in case with property rights over tangible goods, rights regarding intellectual property assets cannot be absolute. Such understanding stipulates that their exercise has to be subject to limitations dictated by the trade-off with the society made in order for these rights to exist in the first place. The public domain represents the mechanism of limiting author's proprietary rights[550] over intangible assets subject to protection by copyright or other forms of intellectual property.

b. Knowledge and sharing as common goods

The analysis of the theory of common property suggests that the process of establishing a system of private property essentially needs to incorporate the common good as its validation mechanism, as the use of this concept contributes to the establishment and maintenance of order in a society. Use of this principle for law-making process aims to

[550] *Cf.* with the "ownership-use" dichotomy and the obligation to exercise property rights in a way that is not harmful for the society on the whole.

ensure that a society and its members are able to give to and receive from each other "powers and resources that as individuals none would possess".[551] It is the pre-eminent goals that society pursues that constitute the common good, and all the philosophers in principle agree on that.[552]

The details of understanding the concept of the common good, its main characteristics and its purpose differ among the philosophers.[553] While for Aquinas the common good has the undisputable primacy over the individual good, Pufendorf sees the happiness of both in a symbiosis,[554] and both Grotius and Hobbes have more egocentric ideas regarding the common good and define it as reducible to the individual good of the members of the society.[555] Boyle takes an intermediary position, in my view similar to that defended by Pufendorf, by trying to balance out the interests of the intellectual property owners and the users of copyrighted material.

The major drawback of the concept of the common good is that it is quite vague if not applied to a particular situation, but referred to as a general concept.[556] Society is a complex organism, and there can be a lot of "common goods" that it wishes to achieve and sustain in order to function well. The philosophers highlighted in this chapter refer the reader to the concepts of human virtue, morality, equity and happiness. Are they precise enough concepts, for instance, to be used to resolve the issue of how broad the access to remote sensing data should be? Can the practical implications of using these

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551 McDonald, H. "The Common Good". Online: <http://www.vaxxine.com/hyoomik/aquinas/commongood.html> (last accessed 01.02.2011).

552 *Cf.* Aquinas' aspiration (to the common good) premise, Grotius' and Hobbes' preservation of peace, Pufendorf's universal values of the humanity, and Boyle's necessity to "have the right to grab" from the public domain in order to promote creativity and enrich society's culture.

553 *See* the table for details, *infra*.

554 Saying that the principles of sociability and private welfare have to co-exist.

555 Applicability of such interpretation to Locke's theory is questionable, according to the Tully-Waldron debate as to the limits of private property. Tully, J., *supra* note 510; Waldron, J. *The Right to Private Property* (Oxford: Clarendon, 1990). *See* also Lametti, D. „Coming to Terms with Copyright" in Geist, M. *In the Public Interest* (Toronto: Irwin Law, 2005) 480-517.

556 Regarding application of the moral virtue to the determination of property regimes and their content see Lametti, D. "How Virtue Ethics Might Help Erase C-32's Conceptual Incoherence", in M. Geist (ed), *From "Radical Extremism" to "Balanced Copyright": Canadian Copyright and the Digital Agenda* (Toronto; Irwin Law, 2010) 309-340 [Lametti, D. "How Virtue Ethics Might Help Erase C-32's Conceptual Incoherence"].

same goods to validate human actions vary from one epoch to another, within different societies or even communities? Is the answer to the latter important at all? This research argues that there are at least some common goods that can guide any human activity and determine whether and how it serves the greater good of a society. Taking into account the contributions of the philosophers, as well as the law-making and law-enforcement practice in general,[557] it seems that there is nothing wrong with immaterial goals of the societal existence serving the basis for even those regulations that govern very utilitarian activities. They can be as wholesome for the purposes of law-making or law interpretation as the arguments of market development. Even more so, if one asks why certain markets are facilitated to develop in a particular way, it is not just for the sake of the development itself, but because they will make the economy stronger, provide more jobs, new services or goods, and ultimately offer people more choice, more variety and more diversity, and make them happier.

The most important instances of the common good that have the immediate importance for shaping and guiding the relationships regarding use and distribution of remote sensing data are knowledge and sharing. Already Aquinas treats knowledge as a common good, stating that it is the cornerstone in searching for the common good, which starts with love and then is enriched by knowledge symbolising will.[558] This observation signifies among other things that knowledge was placed high among societal values and goals of its existence way before the information age of today became a reality and made economic development dependent on access to and use of information.[559] Aquinas' view can be compared to the arguments of Boyle in favour of either a broader access to the public domain or creation of "private commons" (or both) that enable users to share and use each others' ideas and build upon the existing information and knowledge to be creative, produce more works of authorship that in

[557] For instance the use of the equity principle in adjudicating cases and even its use to determine the damages.

[558] It appears that knowledge is a twofold concept: it is both instrumental for finding common goods, and is a common good itself. *See* also Finnis, *supra* note 449.

[559] For an interesting view as to how focus on knowledge might change the approach and may be even the content of copyright law *see* Madison, M.J. "Beyond Creativity: Copyright as Knowledge Law" (April 2010) 15 *Legal Studies Research Paper Series*, 817-851.

the long run will themselves become available to the public at large through their placement into the public domain. Such activity leads to production and accumulation of more knowledge and this clearly shows continuity of the opinion regarding the value of knowledge among philosophers of the past and of today. Particularly nowadays, when knowledge is at the same time considered an important commercial asset, as well as an essential element of educational and intellectual activities, it is of utmost necessity to secure access to its building blocks, one of which remote sensing data undoubtedly comprise.[560]

Sharing is another common good that necessarily is a part of a society's happier life in general, and can govern the processes of data distribution and use in particular. Sharing may be seen, similarly to the case of knowledge described above, as instrumental to reaching the common good, as for instance to acquire knowledge. At the same time the ability or possibility to share itself should be regarded as the common good, as it reflects healthy relations among individuals that lead to a better life of a society. Each of the thinkers emphasises that it is the nature of men to share things amongst themselves, thus the provision of the possibility to do so should also be regarded as contributing to the common good. The importance of such recognition is vividly seen in the discussion of the forms of property – common and private – and their characteristics, in which each philosopher with no exceptions underlines the importance of setting up and maintaining limits to property rights in favour of the society and its interests.[561] Regarding intellectual property assets, including remote sensing data and information, sharing is even more important, as it is the only way to disseminate ideas that allows formation of knowledge in the larger societal context.

Remote sensing data are used to develop various applications and generate valuable information products or deliver information services, be it weather forecasts,

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560 *See* e.g. "Copyright in the Knowledge Economy" European Commission Green Paper COM(2008)466/3 (July 16, 2008). Online: <http://ec.europa.eu/internal_market/copyright/docs/copyright-infso/greenpaper_en.pdf> (last accessed 01.02.2011).

561 *See* Lametti, D. "How Virtue Ethics Might Help Erase C-32's Conceptual Incoherence", *supra* note 556.

information about natural disasters, their gravity and best practical possibilities to mitigate losses they can cause, or data about deposits of natural resources. Thereby they constitute a building block for knowledge about our planet that is of great value for society. Therefore, even though intellectual property rights may be attached to them, the applicable protection mechanisms should not exclude those in need of data from using them for various purposes, particularly for those that are directly beneficial for society. The straightforward link between the use of remote sensing data and the production of knowledge emphasises the necessity to incorporate the theories of the common good and common property into the regime of their protection.

The analysis of the regime of access to public sector information in the previous chapter presented some arguments in favour of viewing it as a viable alternative to the ever expanding copyright protection regime, particularly in the case of remote sensing data. Use of this mechanism that recognises the right of the public to access certain information has one major restriction – it applies only to the data and information generated by public bodies or on their behalf and implies that the public money is spent for this activity. Commercialisation of remote sensing activities is a modern trend, and the relevant national policies of the US and in Europe encourage private companies to engage in them and contribute to the development a strong market of remote sensing data and applications. Purely privately funded activities will exclude the application of the framework of access to public sector information because the restriction highlighted above will definitely not be fulfilled. For this scenario the application of the theories of common property and the common good as analysed in this chapter may be the right answer. The next section provides a set of arguments based on the principles underlying the theories of the common good and common property that support the idea that sharing of data and wider access to them may not be precluded by the fact that they have been privately generated.

3. Sharing and effective exercise of rights in remote sensing data

It was already pointed out throughout the chapter how and why the theories of the common good and common property are applicable to the use and distribution of remote sensing data. Nevertheless, due to the great importance of the applicability issue for the development and support of the argument in favour of a wider access to remote sensing data notwithstanding the source of their generation, it is necessary to spend more time and detail to persuasively explain why the use and distribution of remote sensing data have to be governed by the principles underlying the theories of the common good and common property. The principle of sharing is seen by philosophers both as a common good and as an instrument essential for the achievement of the common good of better life in a society. It is constitutive to the exercise of property rights in a way beneficial to society and not only for their owners. This concept can reconcile and balance out different interests of remote sensing data generators and users, and therefore plays a substantial role in rounding up this argument.

The premise of the necessity to share things elaborated by each of the philosophers should be part of the discourse regarding the legal regime setting up the most appropriate framework for the use and distribution of remote sensing data regardless of whether the source of their generation is private or public. Sharing reinforces the common good, therefore both common and private property have to be distributed and exercised taking it into account as one of the components that together build up and lead to the achievement of the common good. This is also true for remote sensing data and their use,[562] since sharing is the mechanism that enables access to data by users with various backgrounds and therefore allows enrichment of the data by information and knowledge from different fields – a process that fosters their application for multiple purposes and increasing their value.

[562] More than they are currently shared and under conditions that prescribe more extensive use-rights.

The sections below present arguments in favour of application of the principle of sharing to the distribution and use of remote sensing data that are primarily based on two premises. Firstly, there are certain aspects to private remote sensing activities that make them not entirely private or even include equal shares of both private and public involvement. A number of purely private remote sensing activities focus on processing of data and making of information products, both of which require access to and subsequent exchange and sharing of primary data. Secondly, some of the characteristics and applications of remote sensing data, such as were described in earlier chapters,[563] are of great societal value, and serve as a prerequisite for sharing, the absence of which diminishes the benefits of data use.

a. Features of private remote sensing activities

The discussion of the applicability of the principle of sharing to privately generated remote sensing data requires the definition of the "private" actors. According to the US commercial remote sensing policy[564] "commercial remote sensing space capabilities" include "privately owned and operated space systems ..., their ... data, services and related information, as well as foreign systems whose products and services are sold commercially." This definition encompasses two distinct groups of subjects: "end to end", or entirely privately-established and operated, US remote sensing satellite systems, and foreign "hybrid" commercial systems like French SPOT or Canadian Radarsat where the satellites and their launch are provided or sponsored by the governments, but are then commercially operated with the aim to recover in whole or in part the investment costs through data distribution.[565] Whether these public-private

563 *See* Chapter 1, section 1, Chapter 2, section 1(b).

564 *Supra* note 217, I. Scopes and Definitions.

565 Whitelaw, A. "CEOS Relationships with the Commercial Sector" Report (November 8, 2006) at 38. Online: <http://www.conae.gov.ar/ceos/20Plenary_06e-Commercial%20CEOS%20v1-0%20fin.doc> (last accessed 01.02.2011).

systems can be considered as truly commercial or private is doubtful, but it is nevertheless the viewpoint adopted by some European legislators.[566]

For the time being, independent private remote sensing activities are hardly feasible. The main reason for this state of events is the cost of procuring the launch of remote sensing satellite systems. This cost is often too high for a fully private investment. In addition, governments still remain principal purchasers of remote sensing data. Even truly private companies, with their own remote sensing satellites,[567] have governments as their main customers, especially regarding primary remote sensing data.

The synergy of public and private effort in generation and distribution of remote sensing data should be considered a positive trend in the development of remote sensing activities. Such cooperation can resolve a number of challenging issues, like the difficult and costly access to remote sensing data, their interpretation and quality, sufficient degree of exchange among different users, delays in access to data, as well as the lag between the observation activity and the creation of the final information products derived from the generated data.[568] The combination of public and private activities leads *inter alia* to a greater variety of data sources available for use of scientists[569] and other users. These observations support the premise that public and private interests are not necessarily mutually exclusive and can co-exist if they both serve the purpose of the achievement of the common good. This symbiosis is reflected in the practical examples covering both scientific and commercial users. The fact that remote sensing activities represent a form of cooperation of public and private actors suggests that the data have to be exchanged and shared. Such understanding reinforces the feasibility of applying the principles elaborated within the theories of the common good and common property to the use and distribution of remote sensing data. Operation of the

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566 *See* e.g. §1 German Law on the Security of Satellite Data, *supra* note 107.

567 E.g. the US GeoEye, online: <http://www.geoeye.com> (last accessed 01.02.2011).

568 "GEOSS Ten Year Implementation Plan Reference Document" GEO 1000R (February, 2005) at 19. *See* online: <http://www.earthobservations.org/documents/10-Year%20Plan%20Reference%20Document.pdf> (last accessed 01.02.2011).

569 "Towards new partnerships in remote sensing: Government, the private sector and Earth Science Research" National Research Council (2002) at 1. Online: <http://www.nap.edu/openbook.php?isbn=0309085152&page=1> (last accessed 01.02.2011).

remote sensing data market has necessarily to be adjusted within a framework of social justice.[570]

Freedom cannot be separated from ability, resources and opportunities.[571] Access to high resolution and other types of remote sensing data generated by private companies but made available through public-private partnerships is of extreme value as it enables new types of research and other activities.[572] Extensive access to data is in the long run crucial for the development of the commercial sector as well, as it grows most significantly in the market of applications (such as commercial end-to-end services providing high resolution monitoring of land variables). This essentially represents the development of value-adding activities and not the generation of remote sensing data as such that may still remain a cooperative activity. Nowadays public sector provides for the framework, including remote sensing data, and the private actors work on the solutions and particular applications that the data can be used for, thereby building a stronger commercial opportunities and expertise in the sector of value-adding activities.[573]

The highlighted state of events signifies that the success of private value-adding remote sensing activity – the production of highly processed geospatial information often tailored to specific end-user needs – depends on the access to remote sensing data generated by third parties. In this case, as with other cases of using public property for development of commercial activities, development of the commercial applications of remote sensing data that are made available on the principle of sharing enables participation of more actors, expands the relevant market, creates opportunities for specialisation and in the long run makes the society at large richer.[574] Precisely this peculiarity of remote sensing activity and industry calls for the application of the

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[570] Plant, R. Citizenship, Rights and Socialism" in King, P. Socialism and the Common Good: New Fabian Essays (Frank Cass: London, 1996) at 179.

[571] *Ibid*., at 159.

[572] "Towards new partnerships in remote sensing: Government, the private sector and Earth Science Research", *supra* note 569, at 3.

[573] Whitelaw, A., *supra* note 565, at 6.

[574] *See* Rose, C.M. "The Comedy of Property of the Commons", *supra* note 514, at 146 citing Smith, A. *The Wealth of Nations* (Modern Library, 1937) at 13.

principle of sharing to their distribution and use, as it can secure the access to the data and enable their extensive processing, thereby fostering the development of the value-adding activities and production of knowledge derived from the geospatial information.

Without application of the principle of sharing that stipulates the ability of the user to "work" with the data, processing activities will not have much commercial potential, as they may be restricted through licensing mechanisms as described in the chapter on copyright protection of remote sensing data. High level of interdependence of remote sensing data generators, data analysts and other users[575] that exists in practice needs to be properly addressed by the regulations governing remote sensing activities. Their rules may not be driven by the interests of just one of these (at least) three groups that are involved in remote sensing activities and ultimately in the production of knowledge. They should instead emphasise that while abandoning some of their rights with regard to remote sensing data, *all* the players will in the long run benefit from the established compromise of a broader access to remote sensing data based on the principle of sharing.

In practice, application of the principle of sharing can be used as an incentive to adopt mechanisms of shared purchase of privately generated remote sensing data by governments or international organisations for the purpose of their archiving and the optimisation of use for various applications, which in the long run will help to identify gaps that may be turned into opportunities for future commercial activities.[576] It will also encourage more cooperation between the private and the public sector, as for instance in the case of forecasting weather related hazards and the insurance industry, where private sector actors use relevant public sector information and enrich it with their own analyses that are in high demand on the market.

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[575] As without processing remote sensing data have very reduced or no value.

[576] Whitelaw, *supra* note 565, at 16, as well as the discussion of the solutions to facilitate the development of new areas of activities at 17-18.

b. Effective use of remote sensing data

i. Remote sensing data provide basis for generation of knowledge

According to the findings of the International Task Force on Global Public Goods, knowledge constitutes a public good for several reasons found in developments of the past twenty years. The creation of knowledge has increased dramatically, and the private sector plays bigger role in this process than ever before. Patterns and mechanisms of access to and dissemination of knowledge change in the globalising world connected through digital information technologies. Access and dissemination can be virtually limitless but for improperly applied intellectual property protection[577] that in fact restricts access to both information and technologies that transmit it. As a result, even knowledge generated with public funding, as is the case of most types of remote sensing data, is increasingly privatised and commercialised.[578]

The World Meteorological Organisation (WMO) and the United Nations Educational, Scientific, and Cultural Organisation (UNESCO)[579] note that many studies carried out by these organisations or on their behalf depend on the free and unrestricted flow of data. Its importance is emphasised by the fact that many databases in natural sciences contain unique, non-reproducible observations that are by definition available only from a single source.[580] In the contemporary setting this is also true for remote sensing data. And this is one of the reasons against blind commercialisation of generation of primary remote sensing data, and of distribution and use of processed remote sensing data. Analysed information may be treated differently, but as discussed using the example of GEOSS, principle of sharing can govern its use, exchange and dissemination.

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577 As shown in the chapter on copyright and other mechanisms of protecting intellectual property assets.

578 "Meeting Global Challenges", *supra* note 297, at 66.

579 WIPO Documents DB/IM/4 (4.09.1997) and DB/IM/5 (15.09.1997). Online: <http://www.wipo.int/documents/en/meetings/infdat97/db_im_5.htm> and <http://www.wipo.int/documents/en/meetings/infdat97/pdf/db_im_4.pdf> (last accessed 01.02.2011).

580 *Bits of Power*, *supra* note 273.

In order to refresh the discussion regarding the nature and characteristics of remote sensing data in chapters 1 and 2 a few remarks have to be made here in order to develop the argument in favour of broad access to them.[581] Today most of remote sensing data are generated and sent to ground stations for further processing in the form of a binary code. Only after a certain degree of processing do the "zeroes and ones" gain the potential of becoming knowledge. The data that the initial binary code contains may be processed in a variety of different ways and therefore information about different phenomena or characteristics of a geographic area can be gained from the same data. This is probably the most important characteristic feature of remote sensing data that is explained by their technical nature. They do not speak themselves but require interaction with additional information in order to become applicational – serve a particular purpose beneficial to a specific user or the society.

Remote sensing data, according to the opinions of a lot of users across the world, are indispensible, invaluable, and an essential source of information about the characteristics and features of the Earth, as well as a basis for substantiated decision-making in a lot of areas of activity.[582] The use of remote sensing data that is crucial and operational to the generation of knowledge in a lot of different fields should not be underestimated, since knowledge in itself is part of the common good, as well as the means to achieve other aspects of the common good. Based on these findings, the economic interest of revenue generation alone should not outweigh the benefits from uses of remote sensing data for purposes like informed decision-making, mitigation of losses from natural disasters, climate change or sustainable agriculture. Therefore, the rights of users should be recognised and properly incorporated in the regime governing the framework of distribution and use of remote sensing data.

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581 *Infra* pages.

582 *See* e.g. quotes by renowned experts provided on the ESA earth observation portal that unveil numerous benefits that analysis, dissemination and multiple uses of remote sensing data can provide the society with. Online: <http://www.esa.int/esaEO/SEM5N32VQUD_index_0.html> (last accessed 01.02.2011).

The most obvious way to foster the contribution of remote sensing data to the production of knowledge, manifested in their extensive use and utilisation of the facts they contain for different purposes, is to adhere to the principle of sharing. If applied, notwithstanding the nature of the source which generated remote sensing data – public or private – the principle will force legislators and other actors to recognise the necessity of exchanging data and opening the data for more use opportunities. This will streamline any proprietary interests in privately-generated remote sensing data accordingly. Sharing should be seen as an indispensible component of the legal regime governing the generation, distribution and use of remote sensing data. Such an understanding on the one hand flows from and on the other supports the theoretical findings and assertions of the philosophers regarding the common good and the necessity to find a compromise between private interests in administering one's property and the larger societal goals of overall well-being and progress discussed above.

ii. Societal value of remote sensing data cannot be discharged

It is emphasised throughout this research that not only the economic or utilitarian reasons may serve as a basis for enacting legislation: "a law creates legal obligations as a matter of legal logic, but the moral force of law derives from whatever value is created by obedience to it."[583] The latter is determined by what morally important outcomes enforcement of the law is determined to achieve. Some studies[584] point out the "social mission" of a good or a certain relation may justify legislative action not worse than a so-called logic or incentive of "business benefit". Among the benefits of public access to government-held or privately owned information and data are the maximisation of social and overall economic advantages from data access, equality of access, avoidance of the creation of a government information monopoly, and development of the value-

[583] Barry, B. "Does Society Exist? The Case for Socialism" in King, P. *Socialism and the Common Good: New Fabian Essays* (Frank Cass: London, 1996) at 125.

[584] E.g. Craglia, M. *et al.*, *supra* note 310.

added industry.[585] The case of developing the secondary market of remote sensing activities – making of highly processed geographic information products from primary data – is a good example that supports the "social mission" vision. Regulations based on the principle of sharing derived from the theory of the public good that provide for access to data and use-rights better serve the formation of this market than regulations that protect solely proprietary interests of the generators of remote sensing data.

The social mission of remote sensing data that manifests in their various applications underlies the public interest in having access to them. The concept of public interest is used as a justification to set regulatory limitations on the freedom of private activities, where it is necessary to meet certain community objectives.[586] It refers to the interest that people have as members of society, and embodies certain values with regard to its functioning[587] – the common good. There are difficulties in defining the concept of public interest due to its nature and inexpediency as a "principled category"[588] that make problematic the formulation of a specific need of an individual, a group of individuals, or society as a whole that has to be met. In addition to this, the ambiguity of the standards as to the determination of the public interest in terms of its formulation as subjective or objective concept that can be either of a general or a specific nature leads to absence of its legal definition.[589]

Despite these definitional difficulties, the common good of better life of the society manifested through the access to knowledge by virtue of the application of the principle of sharing to distribution of data and information substantiates well the public interest in access to remote sensing data. It reveals the functional dependence of the information society on the availability of information resources that improve efficiency

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585 Clarke, A.L. "Spatial Data Standards: Technical and Management Issues" (1991) *Proceedings of the AURISA Annual Conference* 444.

586 *See* e.g. Selznik, P. "Focusing Organisational Research on Regulation" in Noll, R. ed., *Regulatory Policy and the Social Sciences* (Berkeley: University of California Press, 1985) 363.

587 Bell, J. "Public Interest: Policy or Principle?" in Brownsword, R. ed. *Law and the Public Interest*, Proceedings of the 1992 ALSP Conference (Stuttgart: Franz Steiner Verlag, 1993) at 29 citing Lasswell, H. L. *The Public Interest: Proposing Principles of Content and Procedure* (Nomos Verlag, 1954) at 67.

588 Feintuck, M. *The "Public Interest" in Regulation* (Oxford University Press, 2004) at 179.

589 *See e.g.* Bell, J., *supra* note 587, at 27.

of participation of the public in decision-making processes that affect societal life. Furthermore, it addresses the issue of "information rich" and links its achievement to opening up access to data and information in general and remote sensing data in particular.

Such an approach to formulating the public interest in access to remote sensing data is also supported by the change of fundamental channels of (information) distribution that the information society made a reality.[590] On the one hand, access to information is becoming easier through digitisation and transmission over the internet; on the other, access is more difficult through tightening intellectual property rights over data and information. Internet access can easily become redundant if users cannot access content that is otherwise provided over the network.[591] In the environment where knowledge and information matter, these impediments should be eliminated for the sake of the common good.

In considering the range of uses of remote sensing data, areas of extreme importance for the world community come to mind first. Apart from traditional fields of remote sensing data application like weather services and environmental and climate change research, they can be used for many other purposes, which all have a similar feature – they serve the interests of the community as a whole, and are beneficial also for those who are not involved in their production or direct consumption. Some of the examples that primarily target societal (as opposed to strictly commercial) needs include the European initiative Global Monitoring for Environment and Security (GMES),[592] the

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590 *E.g.* access to information via Internet. In the EU about 40% of the households have access to Internet, *see* "E-Communications Household Survey" (July ,2006). Online: <http://ec.europa.eu/information_society/policy/ecomm/doc/info_centre/studies_ext_consult/ecomm_household_study/eb_jul06_main_report_en.pdf> (last accessed 01.02.2011).

591 Maxwell, C. ed., "*Global Trends that will Impact Universal Access to Information Resources*" (2000). Online: <http://www.isoc.org/isoc/unesco-paper.shtml> (last accessed 01.02.2011).

592 More info available online: <http://www.gmes.info>. The European Parliament's Committee on Industry, Research and Energyrecently allocated €107 million for its operations in 2011-2013. *See* Eckstein, A. "ITRE Committee Gives Green Light to EU Financing of GMES" *Europolitics* (May 17, 2010). Online: <http://www.europolitics.info/itre-committee-gives-green-light-to-eu-financing-art271625-10.html> (last accessed 01.02.2011).

United Nations Charter on Space and Major Disasters (Disasters Charter),[593] set-up and effective operation of GIS such as the European INSPIRE,[594] and the activities of the Group on Earth Observation (GEO) regarding development and set up of the Geographic Earth Observation System of Systems (GEOSS).[595] Worth noting here are also partnerships between developing countries that promote generation, exchange, sharing of and access to remote sensing data on the free and unrestricted basis.[596]

Some particular uses of remote sensing data applications are worth mentioning here as well. Remote sensing data can and are being used to combat hunger by enabling precision agriculture, improved planting and harvesting times, monitoring of crop production, assessment of soil properties.[597] GMES, for instance, has a special Global Monitoring for Food Security service.[598] Remote sensing data can be just as helpful when used to map the spreading vectors of different diseases, like malaria or changa.[599] This application enables those involved to prevent or control the epidemics by providing them with enough data to develop early prediction systems. In another field – energy production – remote sensing data are used to determine advantageous locations of, for example, windmills or the best places for water dams. These are but a few contributions of remote sensing data (when used) to the achievement of the common good.

These examples clearly show that use of remote sensing data serves the common good – improvement of life of the society and its members. Public interest in achieving this goal should be seen as an argument in favour of recognition of the broader rights regarding access to remote sensing data, as this approach will facilitate production and

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593 More info available online <http://www.disasterscharter.org> (last accessed 01.02.2011).

594 For more details *see* Smith, L.J. Doldirina, C. "Moving Space Data towards Public Good" (2008)24 *Space Policy* 22.

595 More info available online: <http://www.earthobservations.org/> (last accessed 01.02.2011).

596 As for instance a very successful China-Brazil Earth Resources Satellites (CBERS) mission. Information online: <http://www.cbers.inpe.br/en/index_en.htm> (last accessed 01.02.2011).

597 At the same time these applications can help the farmers to better conduct their activities and be more successful in the market, and represents in this instance a commercially viable application of remote sensing data and information products.

598 Information online: <http://www.esa.int/esaLP/SEM2UV2IU7E_LPgmes_0.html> (last accessed 01.02.2011).

599 Doldirina, C. "Case for Space", *supra* note 34.

delivery of more useful services and geographic information goods. The process of enhancing wealth and improving conditions of life is not necessarily based on individual property rights.[600] It is especially important in the context of the privatisation and commercialisation of remote sensing activities to ensure access to data and information which would otherwise be foreclosed by its owners. The common good and the public interest to achieve it effectively prevent market-driven closing of non-market spheres of life by prohibiting unnecessary commodification of useful data and information.[601]

4. Conclusions

The analysis of the theories of the common good and common property, and of their influence on the allocation and use of private property rights elaborated by different philosophers through time shows that the evaluation model on which they are built – achievement of the happiness and well-being of both the society at large and its individual members – has survived through time and criticism. They should be invoked again to govern the processes of generation, use and distribution of remote sensing data. One of the most important aspects of the analysed theories is that they do not deny the legitimacy of the private property, but strive to lay down grounds and reasons that limit the discretion of private property owners in the ways they exercise their property rights. These theories equally apply to tangible and intangible property objects, as for instance similarities in arguments brought by Aquinas and Boyle regarding exercise of property rights in land or other objects and intellectual property rights are a vivid proof of.

The theories have their manifestations in practice as well, as seen in the chapter devoted to the issues of access to and use of public sector information. The logic of the theories is applicable to private property as well, and should therefore not be denied

[600] Rose, C. *Property and Persuasion: Essays on the History, Theory and Rhetoric of Ownership* (Boulder, San Francisco, Oxford: Wetsview Press, 1994) at 3.

[601] Leys, C. *Market-Driven Politics: Neoliberal Democracy and the Public Interest* (London: Verso, 2001) at 3.

when establishing the status of remote sensing data. Apart from the direct application of the theories to remote sensing activities, the specificities of data generation and use, as well as the structural set-up of the industry for the time being point to the necessity of the recognition of the applicability of the principle of sharing with regard to remote sensing data notwithstanding the source of their generation.

The next chapter aims at bringing up concrete examples of uses, infrastructures, etc., that support the logic of the proposition to make generation, use and distribution of remote sensing data subject to the principle of sharing that is best suited to strike the balance between proprietary interests of its generators and wider use-rights of those who turn the data into information and knowledge. It rounds up the discussion regarding the applicability of the principle of sharing to use and distribution of remote sensing data by introducing the metaphor of information as a waterway[602] that best reflects their nature and value for the modern society.

[602] The idea to use waterway as a metaphor for treatment of information was inspired by the work of Carol M. Rose, in particular that related to the issues of ownership and common property. *See* e.g. *Property and Persuasion*, *supra* note 600.

Chapter 5: The need to share remote sensing data

The discussion regarding the necessity to apply the principle of sharing to use and distribution of remote sensing data has a direct implication on the existence and success of GIS, the main functions of which include accumulation, management, storage and presentation of geographically referenced data and information. They can be considered the maps of the 21st century, since they combine the data that any traditional map may contain with computer technology. Such synergy turns them into databases that provide the user with the capability to search for specific content and to use only the information relevant for his purpose or to his query. These systems very often use remote sensing data as part of their contents. Recently, GEO started the set-up of the Geographic Earth Observation System of Systems (GEOSS) that, if implemented successfully, will be one of the biggest GIS existing so far. Use of remote sensing data and information is central for GEOSS, as they constitute its primary data source.

This chapter highlights examples of two infrastructures – GIS in general and GEOSS in particular – that utilise remote sensing data. The analysis of the principles and foundations of their successful operation aims to give the practical evidence of the viability of the principle of sharing for the frameworks of use and distribution of remote sensing data and information. The latter are compared to a waterway – a metaphor that is helpful to stress the value of information in today's society and to emphasise the necessity to secure access to it by the same token as in the case of providing the possibility for all in need to use navigable waters, notwithstanding what property regime is applied to them.

The waterway metaphor is used to emphasise that information has a crucial role in building up ties among members of a society, in the same way as waterways connect them physically. More specifically, it seeks to deepen the link between the necessity to share information and the success of remote sensing activities as such, including development of the market for remote sensing data and information products, because

sharing in this case equals to the process of building up a successful infrastructure that has to function in the "real" world. The major premise for using the "information as a waterway" metaphor is that the underlining principle of the regime of access to and use of waterways is that of access and sharing.[603] This principle should be recognised as a basis of the regime of access to information, not only due to certain characteristics of data and information that require sharing, but also because information, in terms of its importance for our lives today, can be seen as a waterway. The argument builds up on the purpose of the operation of a GIS – making information *useful* to various users and tailored to their needs, which is impossible without accumulating the principle of sharing within the regime governing its development and operation.

1. Information is a modern waterway

Information today is an indispensible part of people's lives. It represents a separate product market as well: more information is produced and consumed.[604] A lot of activities are solely directed at providing information that its user is in need of. Apart from these purely "informational" transactions and relationships, nearly any other activity, even activities that are very "physical" or "real" in nature, like farming or construction work, become impossible to properly conduct without enough information regarding a certain aspects of their nature. This brings the societal value of information close to the instrumental value of a waterway: if one does not have access to a passage in an ocean, or a river, or a lake, he cannot reach the final destination of the journey. *Mutatis mutandis*, if today one does not have access to relevant information, it means very often that his activities will never result in the desired or planned outcome. This section highlights the reasons why the public has or should have access to GIS by analogy to the recognised right to access waterways. As research shows, one of the

603 *See* the inspirational work of Carol Rose on the matter. Rose, C.M. *Property and Persuasion, supra* note 600.

604 "Information workers are now more than half the US labor force" – this was stated in the research done in 1985. *See* Cleveland, H. "The Twilight of Hierarchy: Speculations on the Global Information Society" (1985) *Pub. Adm. Rev.* at 185.

main incentives to secure access to waterways is that of the fostering of the public good: the good of a better life would have been much harder to achieve had the access to this resource or infrastructure not been secured. Some of the characteristics of information[605] – its fluidity, expandability, substitutability, transportability, diffusiveness and shareability – enable the use of the waterway metaphor, as they justify an ideational link between the two.

a. Use of the common good considerations to secure access to waterways

Waterways and roads are probably the most rudimentary and in any case the oldest examples of an infrastructure that necessarily includes the basic facilities, installations and services that support the functioning of a society.[606] Almost all infrastructures created by societies have several common elements, such as high-level goal-setting policies, implementation technologies, standards of interoperability, rules and regulations, and resources to create, operate, maintain, and enhance the infrastructure.[607] Various infrastructures[608] have been regarded as "large technical systems" important features of which are networking and systemic technologies.[609]

All infrastructures have three major characteristics: firstly, they enable development of certain applications, secondly, they are shared by a larger community, and thirdly, they are *open*. In addition, different infrastructures can be combined with each other and represent not only the enabling technology itself, but serve as socio-technical

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605 In detail *see* in Onsrud, H.J. "Role of Law in Impeding and Facilitating the Sharing of Geographic Information", *supra* note 599, at 292-306, at 294.

606 Cho, G. *Geographic Information Science: Mastering the Legal Issues* (Chippenham: John Wiley and Sons, 2005) at 60.

607 Longhorn, J. "The Impact of Data Access Policies on Regional Spatial Data Infrastructure" (Paper presented at the 7th EC-GIS Conference, Potsdam, June 10-13 2001). Online: <www.lmu.jrc.it/workshops/7ec-gis/papers/html/longhorn/longhorn.htm> (last accessed 01.02.2011).

608 Including railways, roads, telecommunication networks, electricity and water supply systems.

609 *See* Hanseth, O. & Monteiro, E. *Understanding Information Infrastructure* (1998) Chapter 3 at 3. Online: <http://heim.ifi.uio.no/~oleha/Publications/bok.html> (last accessed 01.02.2011).

networks.[610] Taking into account that information confers power and enables better decision making – thereby affecting the very functioning of a society – access to networks that contain it should be secured on a non-discriminatory basis. Therefore, strongly proprietary private property rights with regard to such networks are not necessarily the most appropriate regime, particularly if these rights are not restricted. This choice against the private property paradigm clearly was taken into account in cases of waterways, access to which was always secured on a community level, and not individually, for instance by their owners or operators.

With regard to certain objects, like waterways in the case at hand, it is sometimes impractical or too expensive to maintain a regime of strict ownership; therefore such a regime should be complemented by a set of restrictions of those owning the resource, or it is substituted by common property.[611] Despite being scarce (especially roads), these resources are valuable to the community or society as a whole, and therefore, any prevention of access to them through (unlimited) private property rights in the long run adversely affects society as a whole, which ultimately includes private owners themselves. Private property without limits could result in these resources being under-used – a situation traditionally called an "anti-commons" or "gridlock".[612] The researchers who address the issue of access to waterways indicate dangers of locking them up, realisation of which resulted in restricting the complete private ownership over them in order to secure social and public interests already at the time the Roman law was operational.[613]

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610 *Ibid*., at 4-5.

611 Rose, C.M. "Property as Storytelling: Perspective from Game Theory, Narrative Theory, Feminist Theory" at 35 in Rose, C.M. *Property and Persuasion*, *supra* note 600.

612 Heller, M.A. "The Tragedy of the Anti-Commons: Property in Transition from Marx to Markets" (1998) 11 *Harv. L. Rev.* 621, at 622-625. *See* also Heller, M. A. *The Gridlock Economy: How Too Much Ownership Wrecks Markets, Stops Innovation, and Costs Lives* (New York: Basic Books, 2008).

613 Pound, R. *Jurisprudence. The System of Law*. Vol. V Part 8 (St, Paul, Minn: West Publishing Co. 1959) at 124.

There are several approaches to justify public access to roads and waterways.[614] The first was already mentioned and is called "public trust" theory,[615] according to which the public always has rights of access to certain property objects, thereby making private owner's rights subordinate to the public's "trust" rights.[616] The second is a prescriptive dedicatory theory, which implies that a period of public usage gives rise to a grant or gift from private owners regarding a certain resource.[617] The third is a theory of "custom", by which the public asserts ownership over a resource under some claim that is older than any memory to the contrary. The fourth view is the "destination" theory, according to which the relationships regarding property are determined by its aspiration and the moral basis for its existence, concentrating on the uses of the objects and the general purpose of the property as an institution.[618] These theories are not going to be discussed in detail; however there is one major element each of them develops, and this is the recognition of the fundamental need to access a certain resource that ultimately influences the way property relations are constructed. This premise or principle links the argument of the common good and common property developed in this research to the issue of the establishment of a legal regime governing access to crucial resources. The foundations of the four theories indicated above for such resource as a waterway serve as a suitable analogy and reinforce the principle of sharing dictated by the concept of the common good as a basis for the regime of access to information in general and remote sensing data in particular. The uses and usefulness of remote sensing data discussed throughout the research are the best evidence of their water-like

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614 For a detailed discussion *see* Rose, C.M. "The Comedy of Property of the Commons: Custom, Commerce, and Inherently Public Property", *supra* note 514, at 106ff, with notes.

615 Sax, J. "The Public Trust in Natural Resource Law: Effective Judicial Intervention" (1999) 68 *Mich L. Rev*. 471-566.

616 One of the counter-arguments is discussed by Onsrud, H.J., „The Role of Law in Impeding and Facilitating the Sharing of Geographic Information", *supra* note 599, at 298: "Because information may be consumed at will and yet remains available for innumerable others as well as future generations, the argument can be made that the public trust doctrine is simply inapplicable to public information".

617 Mostly applied to roadways.

618 *See* Lametti, D. The Concept of Property: Relations *Through* Objects of Social Wealth (2003) 53 *University of Toronto Law Journal* 325, stating that the nature of the object helps to determine the nature of ownership. This theory is the closest to the theories of the common good and common property analysed in the previous chapter and used to substantiate the hypothesis of this research.

indispensability for today's life on the planet. For this reason, the interests of the public cannot be discarded when the appropriate and legitimate regime of access to them is established.

Economic arguments, namely that wide access to a resource is an incentive for more actors to participate in economic activities, to make markets larger, to create new markets and opportunities for specialisation are not extrinsic to some of the public property doctrines or theories that advocate in favour of "less controlled" ownership regimes. Their consideration by the adopted regulatory regime can be valuable for the development of relevant markets and economy in general.[619] The most important aspect of utilising economic arguments though is the extent – they should not outweigh the decisive necessity to accommodate interest of the public at large to access such resources. In particular, with a resource such as waterways, there is a need to always keep the good of the society in mind, and therefore even those who privately own water resources have to use them in a way beneficial to the society and reasonable in terms of existing standards as to the use of that resource. [620]

Water is a resource valuable to all and the "applications" of its use are vast – from direct consumption through navigation to use in industrial production. It is therefore crucial that its use is administered in the interest of the society in general and the duty to share when the necessity arises is inbuilt in the legal regime governing it.[621] Information, and in particular geographic data and information, has today become a resource that is comparable to waterways. The next section discusses this argument in greater detail in order to see why sharing and due care of the society as a whole are essential when administering access to this recourse.

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619 Smith, A., *supra* note 574, at 13.

620 Freyfogle, E. T. *The Land We Share: Private Property and the Common Good* (Washington, Covelo, London: Island Press Shearwater Books, 2003) at 231-234.

621 Pelman, M. & McCann C .R. *The Pillars of Economic Understanding: Ideas and Traditions* (Ann Arbor: The University of Michigan Press, 1998) at 23-24.

b. Value of information infrastructures for the modern society

In the information society, information infrastructures may contribute to eliminating boundaries between people by transmitting knowledge and information across the globe. They thus serve development purposes.[622] Even a very quick look at what the concept of "information society" actually means and what features it incorporates emphasises the important role that information infrastructures play in the sustainable development of such a society. According to the vision of the World Summit on the Information Society, an information society is "people-centred, inclusive and development-oriented."[623] Its growth and the improvement of the quality of life of its members depend on the actual production of information on the one hand, and on the other – on access to it that provides the opportunities for its utilisation and sharing, as well as for creation of knowledge.[624] The global challenge of establishing this type of society stipulates provision of "education, knowledge, information and communication" that are considered as the basis of human progress, endeavour and well-being"[625] – notions that mirror the instances of the common good formulated by Aquinas and further developed by other philosophers as discussed earlier. In this process information and communication technologies gain an immense impact on people's lives, and sharing of knowledge becomes the basis of an information society.[626] Development of an inclusive information society requires cooperation among governments, the private sector, civil society and international organizations. This means *inter alia* building an

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622 *See e.g.* Beardsley, S.*et al*. "Towards a New Regulatory Compact" in Dutta, S. *et al*. eds. *The Global Information Technology Report 2003–2004: Towards an Equitable Information Society* (New York: Oxford University Press, 2004) at 71–86. *See* also Bezzina, J. & Terrab, M. "Impacts of New Technologies on Regulatory Regimes" *Communications and Strategies* (November 15–30).

623 "Building the Information Society: A Global Challenge in the New Millennium" Declaration of Principles, document WSIS-03/GENEVA/DOC/4-E (December 12, 2003) at A 1. Online: <http://www.ic.gc.ca/eic/site/wsis-smsi.nsf/eng/00093.html> (last accessed 01.02.2011) [Geneva Plan of Action].

624 *Ibid*.

625 *Ibid*., A 8.

626 *See* "Tunis Agenda for Information Society" World Summit on the Information Society, document WSIS-05/TUNIS/DOC/6(Rev.1)-E (November 18, 2005) at 26a. Online: <http://www.itu.int/wsis/docs2/tunis/off/6rev1.pdf> (last accessed 01.02.2011).

effective and interoperable information infrastructure that enables all those in need to access information and knowledge.

All these findings are supportive of the argument that the information infrastructure should be treated as a waterway in the information society. It represents a commodity that is on the edge between public and private goods.[627] If not considered a public good, an information infrastructure should in the very least be treated as a merit good, for which "consumption should be encouraged, based upon non-market value judgments by society".[628] Even this scenario invokes the concept of the common good and the principle of sharing. Consequently, the legal regime regarding merit goods is an example of their application to assets, access to which is important to the society as a whole, but that cannot be guaranteed through the application of the concept of public good. Application of the concept of merit good to remote sensing data and information stipulates that states at the very least should acknowledge their obligation to facilitate and not restrict access to them.

In order to support the goals and the development of information society, special norms within national legal systems and among states that secure access to information infrastructure and thereby to information and knowledge should be adopted. Within this legal framework the principle of sharing cannot be neglected, as sharing of information becomes at the same time the common good of a better life, and the good instrumental to its achievement. Information infrastructures are enabling technology, and the appropriate legal regime – resembling by analogy that of access to waterways – should ensure the access to it does not remain a mere declaration.

627 Stienstra, D. *et al*., *supra* note 277.

628 Love, J. "Pricing Government Information" (1995) 22:5 *J. Gov. Info.* at 364.

2. Geographic information systems call for expanding access to remote sensing data

Geographic information, including remote sensing data, is an equally important source for creation of knowledge within the information society as any other, as it allows to relate data and information to specific locations and enables more precise or localised decision-making that remains important even in a globalising world. In order to serve different purposes and be used for various applications, geographic information has to be organised in a certain way that enables searches, combinations of particular data sets, processing that leads to the production and delivery of the end-result. In this case it becomes a useful information product that a specific user needs to acquire. One such way is to organise information in a GIS.

This section deals with the analysis of GIS that represents a specific type of an information infrastructure.[629] The premise of the analysis undertaken, which is based on findings with regard to the nature of an information society, is that these systems are public goods,[630] particularly in their role in its development. It is derived from the previous section, where the nature of the information infrastructure was discussed. After laying down their characteristics and assessing their importance, it is argued that since remote sensing data are an integral part thereof, access to them should be granted according to overall value of those infrastructures for society.

a. The nature of GIS

Geospatial data are now extensively used in a variety of day-to-day situations. GIS are information infrastructures that combine locations in space with positioning systems that can give coordinates for a given point of time. They use tags that can gather information pertaining to time, space or event to any type of activity. GIS is technology

629 For the purposes of the current analysis GIS is synonymous to information infrastructure.

630 Or at the very least merit goods as described above.

that enables planning of systematic collection, maintenance, and management of geographic information, as well as its automated processing.[631] Such systems integrate remote sensing data and information, digital maps and associated information, and the way they are designed is believed to "have transformed our ability to understanding the forces that shape the geographical space."[632] Such a combination of data facilitates the development of new applications for information use. At the heart of their functioning is the capability to translate "spatially referenced empirical information into a spatial language to enable cartographic representations of patterns and relationships," and to analyse their nature.[633] Thereby GIS can influence the ways people learn and perceive the world.[634]

One of the most important characteristics of GIS is that they provide both the tools for decision-making and the content on which these decisions are based. To serve this purpose in a satisfactory way some conditions have to be met.[635] Firstly, information accumulated in a GIS should be as accurate as possible. Secondly, a GIS should contain minimum variations in definitions and presentations of form and structure. Thirdly, the creators of a GIS should eliminate any discrepancies between the real world and depictions of it. Lastly, a GIS should incorporate the means to standardise the presentation of facts.[636]

In terms of organisation a GIS is a complex system that is shaped by a "framework of policies, institutional arrangements, technologies, data and people that enable the effective sharing and using of geographic information."[637] GIS users include public or governmental users, scientific researchers and businesses. Each category itself is not necessarily homogeneous, because its members may have different interests and goals

631 Gupta, R. "SWOT Analysis of Geographic Information: The Case of India" (2000) 79:4 *Current Science* 489.

632 "Business in Earth Observation", *supra* note 130.

633 Sheppard, E. "GIS and Society: Towards a Research Agenda" (1995) 22 *Cartography and Geographic Information Systems* 1 at 6.

634 *Ibid*., at 7.

635 Cho, G., *supra* note 606, at 139.

636 Again, the parallel to waterways comes to mind.

637 Craglia, M. *et al*., *supra* note 310.

in using a GIS. This situation sometimes leads to the result that different access policies are adopted to meet the needs of a specific type of user or use. Even if this is the case, such policies should clearly determine conditions of access and use, including their cost, as well as data protection frameworks. Any terms and conditions of access have to be transparent and applied fairly to all. Regarding optimal pricing some researchers suggest that access to GIS that includes public sector information should be provided at marginal cost.[638] Such a strategy is suggested to be more effective in the long-term, as it enables the private sector to develop markets for value-added products that are made using data and information from a GIS.[639] Moreover, it corresponds to the aim of achieving the common good, and therefore is worth being introduced and applied.

The functioning of a GIS is dependent on the data produced and on how they are made available to the users. The true value of GIS can only be realised if they benefit society as a whole, including individual citizens, economic actors and governments.[640] Because of the amount of data and information that have to be included into these systems, states are key players in developing and maintaining of GIS, although their benefits, especially in terms of enabled value-adding activities, are of equal importance to the private sector.[641] This requires that information is easily shared among the users and has multiple uses in various applications.[642]

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638 Weiss, P., *supra* note 392; *see* also Newbery, D. "Models of Public Sector Information Provision via Trading Funds" (Department for Business, Enterprise and Regulatory Reform and HM Treasury, London, 2008). Online: <http://www.opsi.gov.uk/advice/poi/models-psi-via-trading-funds.pdf> (last accessed 01.02.2011).

639 In such a case the use of information is facilitated, and as more use will be made of the data, the more value will be given to it in the long run, as per Onsrud, H.J. Rushton, G. eds. *Sharing Geographic Information* (New Brunswick, NJ: Rutgers, 1995) at XIV, 502.

640 A study conducted by Sieber, R.E. "Spatial Data Access by the Grassroots" (2007) 34:1 *Cartography and Geographic Information Science*, at 55 shows that "... data access inevitably shaped the applications developed by case study organisations. Accessibility was deemed so critical that, absent the data, the applications tended not to be created."

641 On quantitative and qualitative benefits from establishing INSPIRE s*ee* Craglia, M. "Contribution to the extended impact assessment of INSPIRE" (Environment Agency for England and Wales, 2003) at 36ff.

642 Cleveland, H., *supra* note 504.

GIS are not only huge databases that store spatial and other data, but, more importantly, they can, if promoted as such, be an enabling technology or structure that contributes to and facilitates the development of the information society and the knowledge economy.[643] As in the case of other information infrastructures, the key notions characteristic to a GIS – enabling and connecting – reinforce the analogy with the waterways. Thereby, the argument that ensuring access to such systems is the key to their successful functioning – extensive use that fosters development of applications – on the one hand, and contribution to the development of the information society – the common good – on the other.

b. Legal framework of access to GIS

GIS are based on technology, and therefore access to them can only be secured if the technical standards of the user meet those of the system. This research does not intend to provide any overview of the technical issues, like interoperability or metadata standards, regarding access to GIS and their searchability. As this research shows, though, non-technical factors play an equally significant role in allowing or denying access to GIS, other information infrastructures, or remote sensing data and information themselves. It is not only the technology that influences the society and its development, but also society itself and the goals its development pursues, placed within its political context, that determine the conditions of access to recourses and networks.[644] In fact, policies and regulations may influence very much the development of technology itself[645] through for example agreement upon and adoption of regulations that lay down standards of data interoperability,[646] application of which ensures that

643 Craglia, M. *et al.*, *supra* note 310, at 234.

644 Sieber, R.E., *supra* note 640, at 48.

645 *See* the general discussion on the interdependence of technology and society in Chrisman, N. „Full Circle: More Than Just Social Implications of GIS“ (2005) 40:4 *Cartographica* 23.

646 With regard to the importance of internationally accepted standards of metadata that enable the search of information and data sets and therefore ensure better access to them and their extensive use *see* e.g. “Metadata and GIS” ESRI White Paper (October, 2002), at 3. Online:

data from different sources are compatible with each other and can be combined for refined processing to make information products.

The legal framework within which GIS operate includes not only norms specifically constructed to regulate access to and use of data and information that are integrated in them. It is often shaped by obligation of states under international law instruments, like the Aarhus Convention,[647] and influenced by the non-binding sources of international law like the UN Remote Sensing Principles. The legal framework applicable to GIS furthermore incorporates norms from various areas of domestic law, such as public sector information legislation, competition law, and especially intellectual property law norms. In addition, the regime ideally should address the issues of privacy, confidentiality, the conditions of export of geographic information, as well as liability for provided services. The reason for this is that each and every of these issues may affect collection of data within a GIS and their distribution.[648] Potential problem lies in the differences among relevant norms in legal systems of various states.[649] As highlighted in this research this is true at least with regard to legal rules that determine status of public sector information.[650] Some, like the US, treat it as a non-copyrightable asset and allow access to such information free of charge; others, similarly to Europe, assign its ownership to public institutions and enable them to recover their costs,[651] or even to make profits when information is used by third parties. In the world were information and data can be easily exchanged across borders, these differences represent a practically unacceptable hindrance to the successful functioning of GIS.

<http://www.esri.com/library/whitepapers/pdfs/metadata-and-gis.pdf>. See also information about the standards for geographic information metadata adopted by the International Organisation for Standardisation (February 18, 2009). Online: <http://www.iso.org/iso/catalogue_detail.htm?csnumber=26020> (last accessed 01.02.2011).

647 Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters, 25.06.1998, (1999) 38 *ILM* 517.

648 *See e.g.* in Longhorn, R.A. *et al.*, *supra* note 256.

649 Craglia, M. *et al.*, *supra* note 310, at 240.

650 As elaborated in chapter 3 devoted to public sector information.

651 A more detailed survey of some nations' rules regarding treatment of geographic information *see* in Longhorn, R.A. *et al.*, *supra* note 256, at 39.

The elements of a legal framework are often a result of adopted and followed information policies that include social, political, legal, economic and technological factors decisive in determining the role of information in society.[652] Because of the wide range of issues at stake, decisions made within these policies have different implications on both societal and instrumental levels.[653] In the view that GIS can or often should be treated as a public good, a clear decision as to the extent and the means by which information is protected is crucial. In this regard, the most important point for access policies and regulatory frameworks to promote is how to "let go" – to allow others to access and work with information without being restrained by the proprietary regime attached to it.[654] The step is not the easiest to make, given the complexity of the interests and stakes involved: the analysis of the intellectual property protection of data and of the norms governing access to public sector information reveals many nuances that need to be taken into account when adopting relevant data policies. In such situations it is even more important to have an ultimate policy goal – a teleological basis – on which the decision-making process can rest. The common good theory that this research analyses and the principle of sharing that it develops on its basis can serve the purpose of reconciling various interests to enable access to GIS that *inter alia* will facilitate access to remote sensing data and information, and most importantly, contribute to the achievement of the common good.

Adoption of a clear framework for accessing data and information that GIS contain is fundamental, because very often data come from different sources, and various types of data have to be combined together to come up with an analysed information product.[655] The societal value of the information infrastructure and of GIS already speaks in favour of incorporating the principle of sharing derived from the theory of

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652 Cho, G., *supra* note 606.

653 Maxwell, T. A. "Toward a Model of Information Policy Analysis" (2003) 8:6 *First Monday.* Online: <http://firstmonday.org/issues/issue8_6/maxwell/index.html> (last accessed 01.02.2011).

654 Craglia, M. *et al.*, *supra* note 310, at 240.

655 *See e.g.* Longhorn, R.A. *et al. Legal Issues in the Use of Geospatial Data and Tools for Agriculture and Natural Resource Management: A Primer*, at 14, footnote 13 citing a study by Hajek *et al.*(2001) stating that for agricultural modelling in the EU six different types of geospatial data from often three different sources are needed.

common good within the legal regime governing the operation of these systems and handling the data and information that they contain. An agreement regarding access to data and the ability to share them in order to efficiently utilise all the capabilities a GIS has to offer is crucial for its successful functioning. The example of GEOSS is a perfect illustration of the importance of such an agreement to promote open and unrestricted access to data it integrates.

3. GEOSS and promotion of access to remote sensing data

GEOSS will become a global network of data and other content from multiple providers – "an extraordinary range of information" – that will offer decision-support tools to a wide variety of users.[656] In a proactive manner, GEOSS will link together national and international remote sensing satellites and systems and other sources of geographic information, promoting common technical standards to make data generated from different sources interoperable and coherent. It will operate through the "GEOPortal" that will be the single gateway "for users seeking data, imagery and analytical software packages relevant to all parts of the globe".[657] GEOPortal will in a near real time link them to satellite-based data dissemination systems and thereby to needed data and information, from various sources.[658] Its aim is to provide users with reliable, up-to-date and user friendly information that is indispensible for making decisions, planning activities and managing emergency situations. The data and information will be provided under nine different themes: disasters, health, energy, climate, agriculture, ecosystems, biodiversity, water and weather.

Already this glimpse at the emerging geographic information system of systems transmits the idea of how complex its structure is. Consequently, it is incontrovertible

656 Description of GEOSS, online: <http://www.earthobservations.org/geoss.shtml> (last accessed 01.02.2011).

657 *Ibid*. For users with limited or no access to the Internet, similar information will be made available via the network of telecommunication satellites – "GEONETCast".

658 Satellite remote sensing, air-borne and in-situ data, metadata and products will be accessible to the users. GEONETCast information online: <http://www.earthobservations.org/geonetcast.shtml> (last accessed 01.02.2011).

that the range of issues that influence its set up and, later on, will surround its successful functioning is very broad. They include characteristics and specificities of GEOSS as a system, the aims and goals of its creation, as well as, most importantly, its Data Sharing Principles[659] that are urged to be implemented as closely following the principle of free and open access to data as possible[660] and in accordance with the Data Sharing Action Plan.[661] The ultimate goal of the process to establish GEOSS is to enable "open data exchange across different legal traditions and jurisdictions and reducing institutional, legal, and cultural impediments to data sharing"[662] – to create an information *mare liberum*.

The overview, in particular of the process of negotiating GEOSS Data Sharing Principles, based on open and unrestricted access as their underlying rule, seeks to highlight the viability of sharing with regard to exchange and use of information that GEOSS aims at providing to its future users. Open access approach is not only legitimate, but best suited because the vision behind GEOSS is to provide "comprehensive and sustained"

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659 5.4 "GEOSS 10-Year Implementation Plan" (February 16, 2005). Online: <http://www.earthobservations.org/documents/10-Year%20Implementation%20Plan.pdf> (last accessed 01.02.2011). For a comprehesive overview of the issues involved in the formulation of the principles and challenges of their implementation *see* "White Paper on the GEOSS Data Sharing Principles" review draft (CODATA, 2008). Online: <http://www.earthobservations.org/documents/dsp/Draft%20White%20Paper%20for%20GEOSS%20Data%20Sharing%20Policies_27Sept08.pdf> (last accessed 01.02.2011). [White Paper]

660 *See* "GEOSS Roadmap – GEOSS 10 year Implementation Plan Targets, GEO Work Plan Tasks and Their Linkages" (March, 2008), at 2. Online: <http://www.earthobservations.org/documents/work%20plan/geoss_roadmap_d04_a3.pdf>. *See* also GEO, "Beijing Declaration"(November 5, 2010) Online: <http://www.earthobservations.org/documents/ministerial/beijing/MS1_The%20GEO%20Beijing%20Declaration.pdf> (last accessed 01.02.2011) [Beijing Declaration]. Its para. 3 reads as follows: "*Commit* to (i) maximize the number of documented datasets made available on the basis of full and open access; (ii) create the GEOSS Data Collection of Open Resources for Everyone, a distributed pool of documented datasets with full, open and unrestricted access at no more that the cost of reproduction and distribution; and (iii) develop flexible national and international policy frameworks to ensure that a more open data environment is implemented, thus putting in practice actions for the implementation of the GEOSS Data Sharing Principles".

661 "GEOSS Data Sharing Action Plan" (GEO-VII, November 3-4, 2010). Online: <http://www.earthobservations.org/documents/geo_vii/07_GEOSS%20Data%20Sharing%20Action%20Plan.pdf> (last accessed 01.02.2011).

662 GEO, "Report on Progress" (Beijing Summit: Observe, Share, Inform, November 5, 2010), at 38. Online: <http://www.earthobservations.org/documents/geo_vii/geo7_report_on_progress.pdf> (last accessed 01.02.2011). [GEO Report on Progress]

information to guide "decisions and actions for the benefit of humankind"[663] – the common good.

a. Features of the GEOSS initiative

GEOSS, although not yet operational, is probably the most ambitious project that sets integration, exchange and use of remote sensing data from multiple satellite systems as its primary objectives and the main focus of its activities. Notwithstanding the fact that GEOSS Data Sharing Principles are not fully implemented yet, assessment of their most crucial provisions is relevant for this research and the hypothesis it argues in favour – legitimacy of the principle of sharing as the basis for a legal regime governing access to and use of remote sensing data and information. The first notion supportive of it is the very aim of GEOSS – to enable the processes of making decisions and taking actions for the benefit of mankind to have "coordinated, comprehensive and sustained Earth observations and information"[664] as their basis.

GEOSS will incorporate data and information made available to it by the members and participating organisations, since no new remote sensing satellites or systems are created specifically for it. Moreover, GEO that is setting up GEOSS for the time being consists of 81 countries and of the European Commission,[665] as well as of 58 participating organisations,[666] all of which have representatives in the plenary, where the decisions are made by consensus. In addition, GEOSS is unique in that it sets a common infrastructure to integrate data from various national and private remote sensing satellites and systems and other earth observation resources (*in situ* and aerial), as well as software, models, programmes or any other components that GEO member

663 GEO, "Concept of Operations Document: GEOSS Common Infrastructure" (14th Executive Committee Document 9, November 18, 2008). Online: <http://www.earthobservations.org/documents/excom/ec14/09_Concept%20of%20Operations%20Document%20GEOSS%20Common%20Infrastructure.pdf> (last accessed 01.02.2011).

664 The White Paper, *supra* note 659, lines 14-16.

665 Information online: <http://earthobservations.org/ag_members.shtml> (last accessed 01.02.2011).

666 GEO Report on Progress, *supra* note 662, at 8.

countries decide to contribute to the system of systems. Apart from being the entry point for reception of inputs from the member states, the infrastructure will provide for data integration tools and a special clearing house – a comprehensive search facility that will enable the users to find and use available resources. All resources will be made available for use serving multiple purposes. Altogether, the system of system encompasses a wide spectrum of activities, as depicted in Figure 1.[667]

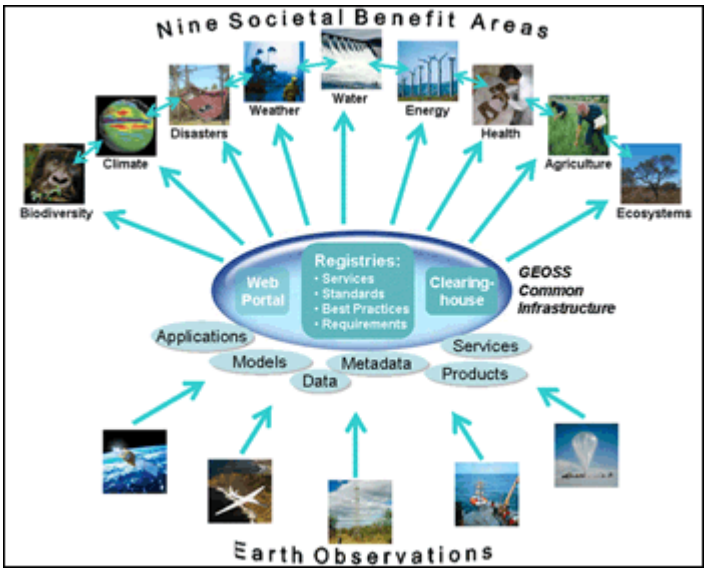

Figure 1: GEOSS Common Infrastructure (source: GEOSS)

The work of GEO Data and Architecture Committee (ADC)[668] is illustrative of the wide range of issues that have to be taken into account and accommodated in order to make implementation and functioning of GEOSS successful. Among others, they include creation, maintenance and update of global datasets and their integration in the information architecture, provision of services for access to data and information with special emphasis on data sharing principles, and control of data quality.[669] All of these

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667 *See* also explanation of key features of GEOSS in DeLoatch, I.B. & Nebert, D. "Building GEOSS: a Tour of the GEOSS Common Infrastructure" (March 13, 2009) 2 *GEO News*. Online: <http://www.earthobservations.org/art_002_003.shtml> (last accessed 01.02.2011).

668 *See* its working documents, online: <http://www.earthobservations.org/com_adc_docs.shtml> (last accessed 01.02.2011).

669 Percivall, G, "Data Way Forward" (Presentation at the 10th ADC meeting, Melbourne, Australia 15 September, 2009), at 11. Online: <http://www.earthobservations.org/documents/committees/adc/200909_11thADC/20090915%20DataWayForward_ADC.pdf> (last accessed 01.02.2011).

items call for targeted, precise and thought through action that requires investment of time, technical and coordination efforts and money.

All these factors contributed to the lengthy and difficult process of agreeing to the core common principles regarding data integration, use and dissemination that GEO went through over the past years. Realisation that effective rules regarding sharing data and information from different existing missions, systems and satellites are crucial for successful operation of GEOSS[670] brought its Data Sharing Principles to the implementation phase. The analysis of the principles points to the link between their underpinning, goals and methods and the philosophy behind the theories of the common good and common property, and in this regard is important for the primary argument of this research for two reasons. Firstly, it validates the philosophical approach chosen as the optimal justification theory for setting up legal framework for use, protection and distribution of remote sensing data. Secondly, it substantiates the reasoning in favour of the principle of free and open sharing that ideally should be applicable to all GEOSS data. Not to leave the findings unsubstantiated, the analysis of the content of the GEOSS Data Sharing Principles below concentrates on the instances of this link.

b. Free and unrestricted use of data within GEOSS

Three overarching principles that govern exchange and use of data within GEOSS were confirmed by members and participating organisations at the 2007 GEO Cape Town Ministerial Summit.[671] Firstly, data, metadata, and products[672] should be shared within GEOSS on the full and open basis: a rule that may be restricted by provisions of

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670 For an analysis of differences in approaches to and factors that influence sharing frameworks for specific projects *see* Doldirina, C. "Are Intellectual Property Laws an Impediment to the Development of Collaborative Earth Observation Missions?" (Paper presented at the International Astronautical Congress, Daejeon, South Korea, October, 2010) [on file with the author].

671 GEO Report on Progress, *supra* note 662, at 15.

672 For the purposes of this chapter all these categories are referred to as GEOSS data.

"relevant international instruments and national policies and legislation". Secondly, GEOSS data should be made "with minimum time delay and at minimum cost". Thirdly, if GEOSS data are requested for research and education purposes, they should be provided "free of charge or at no more than cost of reproduction". Understanding of most of the used terms that is compatible with the vision and goals of GEOSS is provided for in the Implementation Guidelines for the GEOSS Data Sharing Principles.[673] The document is recommended for the members and participating organisations to follow when they set up their relationships with GEO and contribute data to GEOSS. This makes fulfilment of otherwise non-binding[674] GEOSS Data Sharing Principles more realistic on the one hand and coherent on the other.

The argument of the drafters in favour of the free and open access to GEOSS data is based on the premise that the shared data and information represent a public good.[675] The choice in favour of the public good concept is made because GEOSS helps to achieve the widest dissemination of data possible that in its turn will contribute to maximisation of societal benefits from their use, at least within the nine GEOSS themes.[676] Another important feature of the principle is that it is not only the access that should be free and open – users of GEOSS data should be granted the freedom to re-use and re-disseminate them.[677] The possibility to impose restrictions should be kept at the minimum in order not to jeopardise achievement of GEOSS goals. Furthermore, the

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673 As accepted at GEO-VI (November 17-18, 2009). Online: <http://www.earthobservations.org/documents/geo_vi/07_Implementation%20Guidelines%20for%20the%20GEOSS%20Data%20Sharing%20Principles%20Rev2.pdf> (last accessed 01.02.2011) [Implementation Guidelines].

674 *Ibid*., introduction. *See* also para 3 GEO Beijing Declaration, *supra* note 660, that expresses the intention to *commit* to "maximize the number of documented datasets made available on the basis of full and open access". The voluntary nature of GEOSS implementation that was found by the GEO Executive Committee as capable of adversely affecting sustainability of GEOSS, *see* "Mid-Term Evaluation of GEOSS Implementation" (GEO-VII, November 3-4, 2010) at 7, 8. Online: <http://www.earthobservations.org/documents/geo_vii/06_Mid-Term%20Evaluation%20of%20GEOSS%20Implementation.pdf> (last accessed 01.02.2011).

675 The White Paper, *supra* note 659, lines 539-543. *See* also Section 4 Implementation Guidelines, *supra* note 673, where they also refer to the concept of the public good with regard to GEOSS data pricing policy.

676 The White Paper, *ibid*., lines 545-550.

677 Section 2 Implementation Guidelines, *supra* note 673.

principle of open and unrestricted access to GEOSS data should also be applicable to data (when integrated into the system) from private[678] or mixed[679] sources. This decision reflects the finding that the principle of sharing should be applicable to use and distribution of remote sensing data notwithstanding the source of their generation because it makes their use more beneficial for all stakeholders.[680]

"The minimum time delay" means that the GEOSS data should be "transmitted on a real-time basis whenever necessary or practicable".[681] The speed of making data available will ultimately depend on the type of data and application and the need for appropriate quality control. For instance, data for disaster management purposes should be provided as fast as possible, whereas certain delays in access to data for research purposes are acceptable. For the purpose of determining the cost of access to data a reference to the concept of the public good should be also made. As the result, data should be provided free of charge. In cases where access to data can only be made at a price, it should be kept at the very minimum possible.[682]

The voluntary nature of GEOSS may affect the conditions on which the data are made available within the system of systems. Other organisational features of GEOSS should also be taken into account during the implementation of the GEOSS Data Sharing Principles. They include the number of involved countries and organisations, as well as the aim to integrate data from various providers, including private generators. The multiplicity of providers, particularly when GEOSS becomes operational, will require use of efficient mechanisms to authenticate users for data with restricted access, to notify and acknowledge copyright restrictions, to ensure that the data are uncorrupted, to enable payment of charges and fees, when appropriate.[683] Drafters of the White Paper

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678 Section 2.2 Implementation Guidelines, *supra* note 673; The White Paper, *supra* note 659*,* lines 645 ff.

679 The White Paper, *ibid*., lines 606 ff.

680 *See* the last section of chapter 4.

681 Section 5 Implementation Guidelines, *supra* note 673; The White Paper, *supra* note 659*,* lines 785-787.

682 Section 4 Implementation Guidelines, *Ibid*.

683 Percivall, G., *supra* note 669, at 7.

recommend that the clearance of rights (e.g. copyright) over data, as well as of cost recovery should happen after they have been integrated into GEOSS.[684] It goes without saying that, apart from these challenges, the principles of free and unrestricted access to data within the system of systems became the cornerstone of the relevant debate.[685] Some responses to the draft GEOSS Data Sharing Principles serve as a good illustration.

Japan took a position that the principle of unrestricted re-use and re-dissemination of data from GEOSS does not reconcile with its domestic data policy.[686] Germany pointed out that since GEOSS is built upon different systems, the regulations that govern them may sometimes prescribe obligations that not at all coincide with those of the GEOSS data principles.[687] The European Commission was even more precise in its critique of the White Paper propositions, stating that "the unconditional "full and open exchange of GEOSS data" would have violated a number of very well known data policies that do place certain restrictions on access to data."[688]

At the same time, some comments did not criticise, but quite on the contrary supported the "full and unrestricted" principle as indispensible for the success of GEOSS. For instance, the US GEO stressed that without this principle fully endorsed, the system cannot properly function, as "reuse is a crucial capability,"[689] and several members suited action to words. For instance, the US government agreed to provide the Landsat data according to the proposed principle of data sharing through GEO and GEOSS world-

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684 The White Paper, *supra* note 659*,* lines 983-986, 1008.

685 For a general overview of the implementation issues concerning data sharing within GEOSS *see* Edwards, A. "GEO-GEOSS Data Policy or More Accurately the GEOSS Data Sharing Principles" (Presentation at the 1st GENESI-DR Workshop on EO Data Policy Issues, January 26, 2009). Online: <http://www.genesi-dr.eu/documents/5_GEOSS%20Data%20Policy%20-%20A%20Edwards.pdf> (last accessed 01.02.2011).

686 "Response to Review Comments" Annex 1 to the White Paper (Arpil, 2008), at 5. Online: <http://earthobservations.org/documents/dsp/DSP_Annex1.pdf> (last accessed 01.02.2011) [Annex 1].

687 *Ibid*., at 7.

688 *Ibid*. at 10. *Cf*.with the overall European approach to treating remote sensing data and information as analysed in chapters 2 and 3.

689 *Ibid*. at 16.

wide.[690] The same was offered by Brazil and China with regard to the data from their CBERS project.[691] These decisions may push other governments and international organisations to make more of their data available at no or very low cost, especially to research and scientific community. One of the reasons behind is that the volumes of data made available from both missions[692] may decrease the demand for data from generators who do not offer comparable data and data sets at the same conditions. In fact, ESA already announced that data from its GMES Sentinel satellites will be provided on the basis of free and open access in accordance with the relevant data policy.[693]

690 GEO Press Release (November 20, 2008). Online: <http://www.earthobservations.org/documents/pressreleases/pr_0811_bucharest_landsat.pdf> (last accessed 01.02.2011). It, just like the case with Europe, but with the opposite effects, reflects the overall US approach to the status of public sector information.

691 GEO, Report on Progress, *supra* note 662, at 37.

692 The size of the Landsat data archive is enormous due to the fact that the collection of data from Landsat satellites – the first civilian remote sensing satellite system – started back in 1972; CBERS is an extremely successful project that apart from GEOSS provides data on the same conditions to a number of users in African countries, *see* Brazilian initiative is an example of space technology cooperation (December 3, 2007). Online: <http://www.cbers.inpe.br/en_noticias/index.php?cod=not94> (last accessed 01.02.2011).

693 *See* "ESA Member States Approve Full and Open Sentinel Data Policy Principles" *ESA* (November 27, 2009). Online: <http://www.esa.int/esaEO/SEMXK570A2G_environment_0.html> (last accessed 01.02.2011).

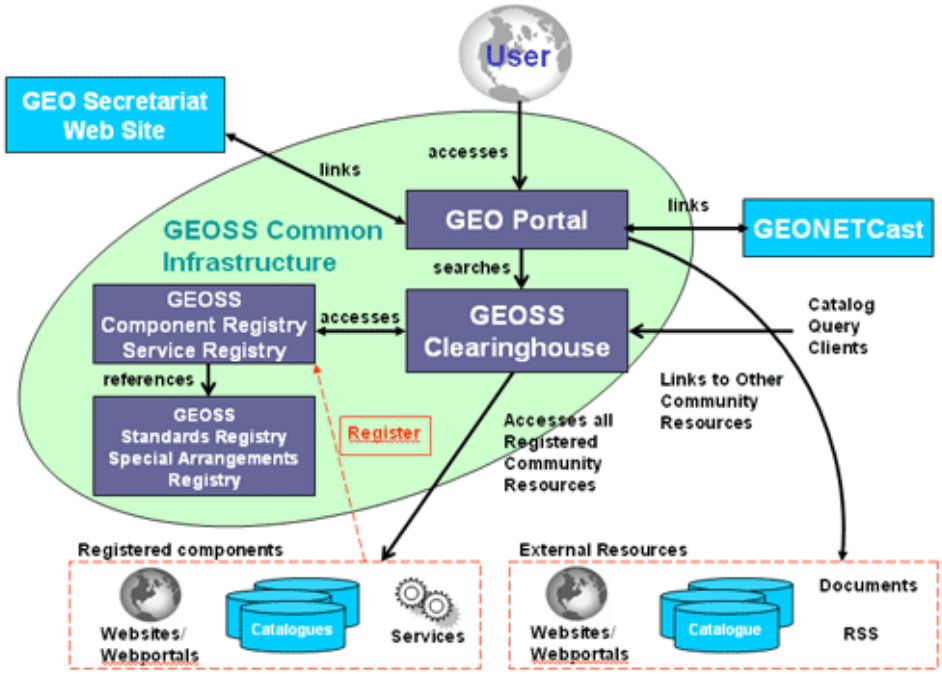

Figure 2: GEOSS data handling structure (source: GEOSS)

The examples cited illustrate how different positions of various entities that belong to different jurisdictions and represent dissimilar interests are, as well as how difficult it might be to reconcile them. Freedom of the participants to provide only the data they voluntarily decide to[694] may be a good way to finding the right compromise in the long run. Due to the fact that GEOSS is based solely on the exchange and subsequent distribution of data and information from existing independent missions and sources, the rules determining the status of data have to be agreed upon to avoid problems that otherwise will inevitably appear once the systems becomes operational.[695] The issue, most likely, would not have been as difficult to negotiate and agree upon if GEOSS had launched and operated its own satellite system. Unfortunately, a system with global coverage and suitable capabilities[696] is not feasible to create within a short period of time by a single actor. The positive aspect is that the initiative to make data within

694 Provided that the data and information will be provided with no restrictions on further use.

695 Doldirina, C."Are Intellectual Property Laws an Impediment to the Development of Collaborative Earth Observation Missions?", *supra* note 670.

696 *Cf*. numbers of satellites required for successful operation and delivery of precise enough information of a navigation and positioning satellite system, or the number of ground stations for near-real time reception and processing of remote sensing data.

GEOSS available on the free and unrestricted basis has a strong support. The short- and long-term implementation of GEOSS will show whether its Data Sharing Principles can be successfully implemented and enforced. What is true, is that both the goals of setting up such a system and the reasoning behind the data principles is a reflection of the theory of the common good and the principle of sharing that it brings forward. Reference to it may foster their implementation process and contribute to successful operation of the system that places achievement of sustainable development as its primary goal. Because there is no greater common good than saving and preserving planet Earth.

4. Conclusions

Nowadays remote sensing data and information are integrated into every major GIS. They are a valuable resource that enables development of a wider variety of services delivered through these systems. In this they become similar to waterways, as both serve the purpose of connecting people (and places). Therefore, access to remote sensing data and information should be secured on the same basis as it is ensured for the access a waterway. Such was the premise with which the research for this chapter started. The analysis undertaken showed that the development of the information society does in fact elevate the issue of securing access to data and information to the recognised importance of access to waterways.

The information society makes information both means and ends of a lot of activities. It therefore changes certain patterns of behaviour within the societies, but they in turn shape the content of information provision of which their demand dictates. Such is also the case with geographic information that influences "society in the forms of decisions made or not made, opportunities seen or not seen".[697] Not only did remote sensing data and information change our vision of the world by providing the humanity with the

[697] Chrisman, N., *supra* note 645.

picture of its home – one single blue planet; they proved to be useful and sometimes indispensible for addressing a broad range of issues related to the life on Earth.[698]

Duplication of capabilities together with use of various standards of data generation, processing and metadata led to the situation where large quantities of primary remote sensing data are not being processed or utilised, which means that no value is being extracted from them. But various problems or challenges create numerous applications for remote sensing data and information and therefore there is a necessity to provide effective access to them and encourage their processing, use and further dissemination. This was realised by GEO when it initiated the set up of GEOSS to integrate as much remote sensing data as possible and provide them for effective use in nine application areas.

Another important realisation that drives implementation of GEOSS is that unconventional sharing of data within the system with the minimum restrictions imposed on their further re-use is promoted as *the key* to the successful operation of the geographic information system of systems. The encouraging development in this regard is that the GEOSS Data Sharing Principles that establish free and open access to GEOSS data are approved and currently being implemented by its members and participating organisations. Commitment to achieve the greater common good of assisting making informed decisions for the benefit of mankind took over "short-term ambitions" of some of the GEO members that dictated their proprietary approach to treating remote sensing data and information.[699] Sharing of data and their effective use and dissemination were seen as an international priority that cannot be reconciled against the desire of some countries to protect their national or commercial interests by locking up data and information they or their nationals produce.

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[698] Onsrud, H.J. "Role of Law in Impeding and Facilitating the Sharing of Geographic Information, in Onsrud, H.J. & Rushton, G. eds., *Sharing Geographic Information, supra* note 639, at 292.

[699] Gibson, R. "GEO Needs Stronger Political and Financial Support to Succeed" (Keynote speech at the GEO-IGOS Symposium, Washington, November 19, 2009). Online: <http://www.earthobservations.org/art_007_006.shtml> (last accessed 01.02.2011).

GEOSS is a clear proof of the viability of the philosophy of sharing promoted within the theories of the common good and common property, because often achievement of the common good that it implies when applied to property relations satisfies individual goods of the members of a society. And although GEOSS is not yet operational and implementation of its Data Sharing Principles is based on the voluntary commitment of the participants, the example is set.

Remote sensing data should be made accessible either on a stand-alone basis, or when within a GIS, since only a broad access to them will enable further development of the information society by fostering the production and the delivery of information goods.

Conclusion

Information contributes to the generation of knowledge. Knowledge empowers. Production of both requires investment of resources. The latter brings forward the necessity to reward and protect generators and owners of information. At the same time, utilisation of information is impossible without access to it. The belief that the two are antagonistic leads to the paradox, or rather the dilemma that any regulatory regime regarding data, information and goods derived from them faces and needs to address. The issue at its core is how to achieve the balance between protection and access, and how to accommodate properly the interests of both the generators and users of information. This research rests on the premise that the focus on the protection of the generators of data and information alone, particularly by virtue of property-like protectionist regimes is a false strategy. Sharing of data should be promoted instead. The analysis of the issues relevant to the determination of the appropriate legal regime of information was conducted using remote sensing data as the primary example. The reason why they were chosen to be the focus of the present research is in the first place their ever growing importance and value.

Remote sensing data are an indispensible raw material for production of geographic information. Integrated into GIS they often become the basis for making various decisions regarding political, humanitarian and business matters. For some activities (like climate change research and disaster relief) they are often the most important or a sole source of information. Usability, usefulness and value of remote sensing data normally increase with the degree (and sophistication) of processing and analysis applied to them. Remote sensing activities have evolved substantially over the past two decades and involve now a variety of actors who both generate and utilise data and information. Since remote sensing is no longer procured exclusively by states and thus became more complicated, it cannot take place in a legal vacuum. The applicable legal regime, in order to be effective, has to reflect the specificity of the regulated activity and its outcomes.

This research showed that the decision as to how to protect remote sensing data can be made in favour of a variety of choices that lie between the two extremes. The first one is that of highly proprietary protection of remote sensing data whereby they are treated as an expensive commodity and the emphasis is put on safeguarding the interests of their generators. The second extreme guarantees free and unrestricted access to remote sensing data, as well as their availability for use as such and focuses on the needs of their users. The analysis of the two approaches to regulate issues related to remote sensing data that to a great extent reflect the two extremes – the proprietary model of the EU and the access model of the US – undertaken within this research enabled the suggestion that the preferential treatment of the generators of remote sensing data precludes achievement even of the commercial (economic) goal of developing the strong market for remote sensing data and information products. Data regarding the growth of the markets for remote sensing and satellite weather data reveal that it is more significant in the US than in Europe. Apart from the statistics and information regarding the specificities of the market for remote sensing data, as well as technical aspects of their nature, several other factors were identified as the most relevant and supportive of the argument in favour of the wider access to remote sensing data.

Some of the most characteristic aspects of remote sensing activities in this regard are the synergy of public and private involvement, the initial expensiveness of projects and missions, as well as the necessity of value-adding activities for successful marketing of remote sensing data. The significant presence of governments or actors on their behalf influences the status of remote sensing data. Therefore, often in parallel to intellectual property rights and other regimes of information protection, the legal framework regarding public sector information comes into play when handling remote sensing data. This regime is quite different from, for instance, copyright, as it is based on the recognition of the right of citizens to access government held or produced information and use it for their own needs and purposes. The applicability of this field of law sometimes leads to a situation where two regimes – copyright and public sector

information – that are based on opposing principles govern access to and use of the same data sets or products, which should not be the case.

Probably the most important factor that supports the necessity for the chosen legal regime to promote sharing of remote sensing data is that their use often has a direct impact on society, particularly improvement and sustainability of its development. This societal aspect and value of remote sensing data necessarily and inevitably suggests that the principle of sharing should be incorporated by the best suited legal regime governing their generation, protection, distribution and use because the greater good achieved through extensive exchange and use of data outweighs the desire of data generators to have broad control over them. The theory of the common good that promotes such a strategy when allocating rights and obligations over particular assets or in particular relationships provides a valid basis that can be used alongside or instead of the utilitarian or economic approach when reasoning against the protection of remote sensing data by strong proprietary regimes.

In addition, the necessity to determine the legal regime for remote sensing data is based on the fact that such data (particularly primary) hardly fit into the framework of copyright protection that nevertheless is often resorted to as relevant and effective. The difficulty in the application of traditional copyright protection to, in particular, primary remote sensing data is explained by their nature and the modes of their generation: they represent a computer-acquired depiction of facts about the Earth. Very often the wish of those who generate remote sensing data is to protect them as such – to have influence on the access to their content: a goal, for which copyright is equally poorly suited. Inapplicability or inefficiency of copyright with regard to handling remote sensing data substantiates the legitimacy of the search for a regime alternative or complimentary to it.

The suggested principle of sharing reflects the desirability of promoting the applicability of the access model legal regime to remote sensing data, and is derived from the theories of common property and the common good. The theories that Aristotle started

developing thousands of years ago bring forward the notion of the primacy of common use over private property. The thinkers who contributed to the shaping of the theory brought forward the idea of primacy of common property over private property and agreed that some things always remain in common ownership or use. They also stipulate that the interdependence of the happiness of the single (citizen) and the whole (society) needs to be taken into account when allocating the rights and obligations even within the private property regime. Sharing can be used as the guiding principle that balances the – sometimes seemingly – different interests of data owners and the society at large. It prevents allocation of excessive power to, for instance, owners of private property by limiting their ability to exercise their powers in a way that does not unnecessarily impede promotion and achievement of important societal values and needs. The society has the interest in secured access to remote sensing data because their use contributes to sustainable development, and this is only one, the most obvious, argument that this research identified as calling for the recognition of the principle of sharing as part of the legal regime governing remote sensing activities.

The principle of sharing is not only applicable to tangible property, as Aquinas, Grotius and others have described, but equally to intellectual property. Its relevance for intellectual property protection regimes manifests at least in three instances. Firstly, the traditional interpretation of the proprietary regimes that protect information and other comparable assets seek to establish and maintain the balance between the interests of their rightholders and users. Secondly, such notions as fair use (or exceptions to the rights of intellectual property owners) and the public domain constitute an indispensable element of any intellectual property protection regime. Their very existence is tied to the fundamental principle of free and unrestricted exchange of ideas that can be hampered without imposition of the principle of sharing as a constitutive element of intellectual property protection. Thirdly, among other ideational creations data and information are very similar to tangible assets that have been always considered and recognised as objects that should not be privately owned – high seas

and waterways. Information, once communicated, cannot be captured, just like the flowing water.

The practical viability of the principle of sharing as applied to remote sensing data and information is shown in the first place on the examples of GIS and GEOSS that represent the channels through which remote sensing data and geographic information products flow and may be exchanged by the generators and users. These structures may either themselves be a commercially viable activity or provide resources for third parties enabling their businesses. For this reason alone sharing and at least a grain of commonality that they have to incorporate should not be seen as a threat to the development of the relevant market for geographic information.

The development and functioning of GIS and GEOSS is an illustration of how many players and stakeholders are involved in the generation and utilisation of geographic information in general and remote sensing data in particular. The spectrum of use of the same datasets sometimes seems infinite and encompasses commercial and pro-bono utilisation, and can be of purely applied nature (useful for conducting a primary activity) or be of value in themselves. The multiplicity of sources that generate primary remote sensing data often necessitates that the generators themselves acquire data from other sensors or instruments in order to produce marketable end-user geographic information products. The feature of developing commercial market for remote sensing information products through support from or cooperation with the public sector in the process of their generation and use elevates the necessity of sharing of primary data to be recognised as a prerequisite for the maximisation of the value of remote sensing data and the benefits from their use.

The plea in favour of opening up access to remote sensing data in this research calls for the realisation and acceptance of the necessity to make decisions that accommodate interests not only of the actual or potential owners of information, but also of its users,

in particular because remote sensing data and information have little value without use, and the benefits of their use "cannot be achieved without data sharing."[700]

[700] The White Paper, *supra* note 659.

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