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AWARENESS RAISING ON EO/GI/SDI FOR SDGS – THE CASE OF HUNGARY

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SUMMARY

Approved by the UN General Assembly, the UN 2030 Agenda is a global program for the years 2016-2030 to achieve the selected Sustainable Development Goals (SDGs). Associated targets and indicators have been set up to be monitored and reported yearly in multi-sector collaboration of national level stakeholders together with the national statistical offices. Majority of the targets and indicators have spatial nature and Earth observation is inevitable to ensure their cost-effective measurement in order to tracking the progress of implementation of the SDGs. It was explicitly stated in the Resolution of the UN General Assembly, that the indicators have to be disaggregated by geographical location where appropriate.
It became obvious, the following aspects will play vital role in the success of the program:

- Geospatial information, Earth Observation data and data sharing
- spatial data infrastructures, Earth observation information infrastructure
- related capacity building
- open data, open source tools and advanced data access architecture
- partnership between data custodians and other stakeholders.

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The early engagement of the stakeholders is critical. Awareness raising campaigns are needed form local to global, where the EO4SDGs Strategic Implementation Plan could serve as a guideline (GEO, 2017).
The Hungarian approach in the awareness raising calls the attention of the geospatial community and stakeholders, how their technologies and services can contribute to the support of the achievement of SGDs. Started in February 2017, the awareness raising campaign was executed by volunteer members of the Hungarian Society of Surveying, Mapping and Remote Sensing (MFTTT).

Key words: UN 2030 Agenda, Sustainable Development Goals, Earth Observation, Geographic Information, Spatial Data Infrastructure, Statistics, SDG Awareness Raising in Hungary, SDG Engagement of stakeholders in Hungary

FLASHBACK: THE WAY WHICH LEAD TO THE UN 2030 AGENDA

Human activities besides their economic and societal impacts affect unprecedented manner our environment as well. The crucial importance of the environmental protection was formally recognized widely first by a high-profile international conference organized by the UN, hosted by the Swedish government. 4 decades of follow-on actions lead the way to the formulating and adopting the UN 2030 Agenda on the Sustainable Development (SD) in 2015, and an international consensus on the Climate Change was reached by state heads in the Paris Agreement in 2016 (UN FCCC, 2017). Table 1 provides an overview of the milestones.

Table 1: Milestones on the way toward the UN 2030 Agenda (Scott, Rajabifard, 2017, Anderson et al, 2017)

Action	*Location, date*	*Features*
UN Conference on Human Environment	Stockholm 1972	Formulating the concerns Participated by 113 countries
UN World Commission on Environment and Development (WCED)	Geneva 1983	Established by the UN General Assembly Getting a political mandate
Our Common Future	New York 1987	Definition of SD Adopted by the UN General Assembly,
Earth Summit UN Conference on Environment and	Rio de Janeiro 1992	Rio Declaration on ED with 27 principles Agenda 21 with 40 chapters

Development (ED)		signed by 178 countries
The Millennium Summit	New York 2000	Agreed in 8 Millennium Development Goals with deadline 2015 signed by 189 countries
International Summit on Sustainable Development	Johannesburg 2002	Role of EO/ geospatial data and technologies mentioned
Rio +20 Conference Earth Summit on the SD	Rio de Janeiro 2012	The Future We Want – common vision. Importance of EO/GI and technologies acknowledged 192 countries presented

LESSONS LEARNED AND SETTING UP THE WAY FORWARD

By revisiting and evaluating the achievements and shortfalls of the UN Millennium Development Goals program, it was recognized that for future actions the goals have to be widened, an indicator framework has to be establish and yearly monitoring and reporting is needed to ensure better established, disaggregated information- and evidence-based decision making.

The SDGs and their associated targets were elaborated by the UN Open Working Group on Sustainable Development Goals co-chaired by Ambassadors and Permanent Representatives of Hungary and Kenya to the United Nations Csaba Kőrösi and Macharia Kamau respectively, between 2014-2015 and prepared for the UN Sustainable Development Summit held in New York between 25-27 September 2015. The 2030 Agenda for Sustainable Development was adopted by 193 Member States of the United Nations unanimously on 25 September 2015 (UN, 2015a). The document was published on 21 September, 2015 entitled Transforming Our World: The 2030 Agenda for Sustainable Development (UN, 2015b).

On 19 February 2016 the UN Economic and Social Council distributed a proposal elaborated by the Inter-Agency Expert Group of the UN Statistical Division on data and indicators in the 2030 Agenda context for discussion and decision at the 47th Meeting of the UN Statistical Commission held between 8-11 March 2016.

The major steps of the approval mechanism of the current 230 indicators associated with the 169 targets (4-20 per SDG elaborated also by the Inter-Agency Expert Group of the UN Statistical Division) include the (1) Preparatory phase by IAEG-SDG, (2) Review and approval by the Meeting of the UN Statistical Committee (UNSTAT in March every year), (3)

Approval by the Meeting of the UN Economic and Social Council. (UN IAEG, 2016).

THE IMPACT OF SDGS ON THE GEOSPATIAL AND EO COMMUNITIES

The implementation of the UN 2030 Agenda provides opportunities, challenges and responsibilities not only for the member countries of the United Nations, but for custodians and stakeholders of a wide range of data communities including the Earth Observations and geospatial ones, because these latters' data, information, infrastructures, services and related technologies offer cost-effective support of the statistics in monitoring the targets and indicators and achieving the SDGs.

About data, monitoring and accountability the Resolution 70/1 of the UN General Assembly (25.9.2015) explicitly mention (UN, 2015a):

"17.18 By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts "

Disaggregated by geographic location: this is why the already recognized role of EO/geospatial data, spatial data infrastructure including related services and technologies will be significantly upgraded, generating impacts on national-level strategy formulation, improving data policies, capacity building and need for interdisciplinary/multi-agency coordination and collaboration, including public-private cooperation. It is anticipated, the geospatial and EO-related industry will steadily grow generating high-tech jobs providing value-added products and services from local to global markets.

Location matters. In this context the international terrestrial reference frameworks such as International Celestial Reference Frame, (ICRF), International Terrestrial Reference Frame (ITRF), European Terrestrial Reference Frame, (ETRF), Hungarian Datum 1972 (HD72) and the Global Geodetic Observation Systems (GGOS) as well as their geometric, gravimetric and oceonagraphic measurements systems as well as the metrology standards have fundamental role in the spatial and temporal monitoring of the indicators (Altamini, 2012).

As far as the Earth observation and geospatial information support of the official statistics in monitoring and achieving the 2030 Agenda is concerned, the GEO and UN GGIM publication (GEO, UNGGIM, 2017) and presentation of Steven Ramage of GEO Secretariat held at the recent

European Forum on Geography and Statistics are relevant references (Ramage, 2017)..

INSTITUTIONS, ORGANISATIONS, SUPPORTING SDGS BY PROVIDING AND/OR USING EO/GI

Table 2 shows some major players involved in SDG related actions

Table 2: Examples of governmental, academic, industry and NGO stakeholders in EO/GI areas supporting the achievement of SDGs directly on indirectly

	Examples
Some EO institutions	GEO, GEO EO4SDGS, CEOS, ISDE etc.
Some Geospatial institutions	OGC, USGS, JRC IES DERD etc.
EO/geospatial programmes of space/governmental agencies	ESA (Copernicus, Galilei, LTDP), GADC, NASA, USGEO, etc
UN institutions	UNEP, UNDP, FAO, HABITAT, etc
UN-related bodies	ECOSOC, UNSTAT IAEG-SDG, IAEG-WGGI, UN Commission on SD, UN-GGIM (Academic Network, Geospatial Societies, Industry, Regional Networks), Data4SDGs, etc.
Other institutions, alliances	The World Bank, IISD, Regional and national Statistical Offices
Global Geospatial Societies/Organisations	International Federation of Surveyors (FIG), International Society of Photogrammetry and Remote Sensing (ISPRS), International Cartographic Association (ICA), International Association of Geodesy (IAG), International Standard Organization, Technical Committee 211 (ISO TC/211), Open Geospatial Consortium (OGC), Global Spatial Data Infrastructure Association(GSDI), Open Source Geospatial (OSGeo) etc.
Regional institutions, platforms	EU, countries of V4
Regional frameworks, programs	Danube Region Strategy,
Regional alliances	Europe: EuroGeographics, UNECE WPLA, EUROGI, EuroSDR, GEE-See, EULIS, etc.

The intergovernmental Group on Earth Observation (GEO) alone attracted so far 105 countries and 118 participating organizations as member . The

importance of the progress of SDGs is reflected by the fact, that the report on advancements is announced by the UN Secretary General. The second annual SDG Progress Report was announced in June 2017.(Risse, 2017)

EO/GEOSPATIAL DATA FOR SDGS – GEO/UN-GGIM EXAMPLES USED FOR AWARENESS RAISING

The proven applicability of the Earth observation in support of the Sustainable Development Goals and some selected application areas were introduced at the Statistics-Geospatial Information Forum, a side event of the 47th Meeting of the UN Statistical Committee in March 2017 as shown on Table 3 and Table 4.

Table 3: EO/GI data supporting the achievement of SDGs in some selected application areas. Source: (GEO, UN-GGIM, 2017). Its translated version was used in the Hungarian awareness raising campaign

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Table 4: Earth observation and geospatial information linkages to SDG Goals, Targets and Indicators Source: (GEO, UN-GGIM (2017) [♣].Its translated version was used in the Hungarian awareness raising campaign

Target (Contribute to progress on the Target, not necessarily the Indicator)									Goal	Indicator (Direct measure or indirect support to the Indicator)					
							1.4	1.5	1 No poverty	1.4.2					
						2.3	2.4	2.c	2 Zero hunger	2.4.1					
					3.3	3.4	3.9	3.d	3 Good health and well-being	3.9.1					
									4 Quality education						
								5.a	5 Gender equality	5.a.1					
		6.1	6.3	6.4	6.5	6.6	6.a	6.b	6 Clean water and sanitation	6.3.1	6.3.2	6.4.2	6.5.1	6.6.1	
					7.2	7.3	7.a	7.b	7 Affordable and clean energy	7.1.1					
								8.4	8 Decent work and economic growth						
					9.1	9.4	9.5	9.a	9 Industry, innovation and infrastructure	9.1.1	9.4.1				
						10.6	10.7	10.a	10 Reduced inequalities						
	11.1	11.3	11.4	11.5	11.6	11.7	11.b	11.c	11 Sustainable cities and communities	11.1.1	11.2.1	11.3.1	11.6.2	11.7.1	
				12.2	12.4	12.8	12.a	12.b	12 Responsible consumption and production	12.a.1					
					13.1	13.2	13.3	13.b	13 Climate action	13.1.1					
		14.1	14.2	14.3	14.4	14.6	14.7	14.a	14 Life below water	14.3.1	14.4.1	14.5.1			
	15.1	15.2	15.3	15.4	15.5	15.7	15.8	15.9	15 Life on land	15.1.1	15.2.1	15.3.1	15.4.1	15.4.2	
								16.8	16 Peace, justice and strong institutions						
17.2	17.3	17.6	17.7	17.8	17.9	17.16	17.17	17.18	17 Partnerships for the goals	17.6.1	17.18.1				

EXAMPLE FOR USING OPEN EO/GEOSPATIAL DATA AND OPEN SOURCE TOOLS FOR SDGS

The yearly arranged European Challenge for students and young professionals of SMEs to take part in innovative application development in competitive environment using the NASA-ESA developed Web World Wind open source virtual globe attract challengers from all over the world as it was presented at the 10th Digital Earth Symposium and Locate 17 Conference hosted by CRCSI (Hogan et al, 2017). Growing number of projects are using open Earth observation and geospatial data (eg. Sentinel, OpenStreetMap). For example, the DelBianco CitySmart project provides multipurpose analysis and visualization capabilities, using wide range of open EO/geospatial data to support more evidence based decision making

envisaged for Local Governments in the SDG 11 associated targets and indicators context (Remetey-Fülöpp, 2017).

Figure 1: The SDG 11: Sustainable cities/ communities with the associated targets

In the World Wind Europa Challenge 2017 hosted by the Digital Finland Forum and Nokia in Espoo, one of the award winner project AgroSphere is capable incorporating and analyzing any number of spatiotemporal geographically-accurate data from multiple sources for agriculture and atmosphere enabling the analysis and visualisation of the effect of climate change on agriculture using a large collection of global agriculture and climate data and the free, open source Web World Wind Software Development Kit. By handling disaggregated data by location, such tool might contribute to SDG target/indicator monitoring and reporting. (NASA, 2017).

INSTITUTIONAL BACKGROUND OF THE IMPLEMENTATION OF THE UN 2030 AGENDA ON SUSTAINABLE DEVELOPMENT GOALS IN HUNGARY

Actors are shown on the Table 5.

Table 5. Actors playing major role in the decision making related to the implementation of SDGs in Hungary

Hungarian National Assembly, Committee on Sustainable Development
National Council for Sustainable Development
Office of the President of the Republic, Directorate for Environmental Sustainability
Prime Ministership

Ministry of Foreign Affairs and Trade
Ministry of Agriculture
Ministry of National Development
Representatives of Parties of the Hungarian National Assembly
Universities, Academic institutions, Foundations, Boards and Councils
Non-governmental Partner Organisations e.g. National Society of Conservationists - Friends of the Earth Hungary (MTVSZ), Hungarian Society of Surveying, Mapping and Remote Sensing (MFTTT) etc.

NATIONAL SUSTAINABLE DEVELOPMENT FRAMEWORK STRATEGY

In Hungary, Governmental degree 1888/2016. (XII. 29.) prescribes the implementation of the National Framework on Sustainable Development (NCSD, 2015). Reporting is the task of the Ministry of Agriculture in collaboration with other governmental agencies. The report prepared for the National Assembly is submitted to the National Council on Sustainable Development first.

During the past 12 months events have been arranged in Hungary, which dealt with the 2030 Agenda on the Sustainable Development including the Plenary Meeting of the Executive Committee of the UN GGIM:Europe in Budapest, 5.10.2016. participated among others the prime geospatial data provider Department of Land Administration and Geo-information of Ministry of Agriculture, National Statistical Office, from abroad the UN-GGIM Secretariat, EuroGeographics, GSDI, EUROGI, UNECE and others. Katalin Tóth, Deputy State Secretaryof the Ministry of Agriculture, expressed her view: „The operation and achievements of the Hungarian Land Administration are well known and acknowledged in the European Union and beyond, consequently we can contribute to the professional issues addressed such as the visions, formulation of regulations and standards" (Tóth, 2016).

For example, the support of the achievement of the first two SDGs using GI/EO data, services and technologies in Hungary are provided as follow:

SDG 1 No poverty. Important indicators are the land and real estates

Inventory and cadastral surveys as well as TAKAROS, DATR, FÖNYÍR, Land Information Systems

SDG 2 Zero hunger. Indicators related to food security, traceability, sustainable agriculture are supported by land use land cover monitoring, MePAR, CwRS, VINGIS, wide range of EO data acquisition (satellite, airborne, UAV, in-field), food-chain systems etc.

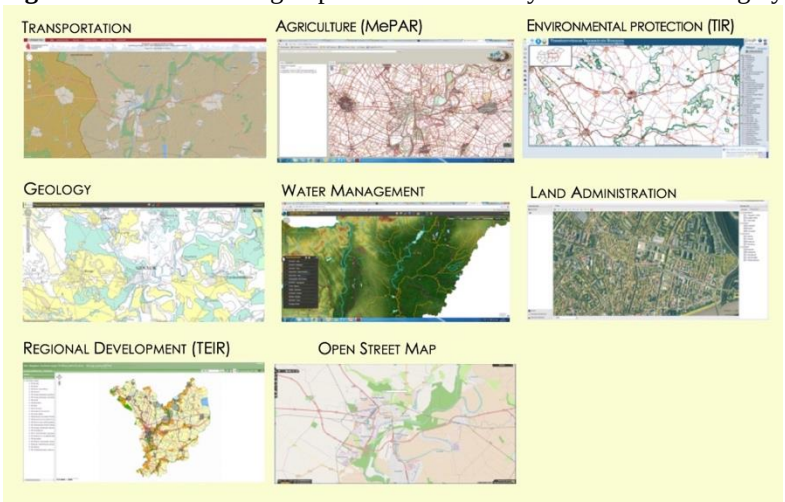
Another SDGs-related Conference was arranged by the National Council for the Sustainable Development in conjuction with the Hungarian Society of Conservationists - Friends of the Earth Hungary
on 7 February, 2017 with the aim to identify the progress and setting up tasks to be done e.g. the amendment of the present National Framework on Sustainable Development document. (Zentai, 2015).
The Hungarian National Assembly was the very first who ratified the Paris Agreement on Climate Change in 2016 paving the way for the elaboration of the 2nd National Strategy on Climate Change whereas efforts have been made by the Department on Climate Policy and the Hungarian Space Office of the Ministry of National Development to emphasize the Earth Observation and related issues such as the EU Copernicus programme as well as the utilisation of the national Earth Observation Information System. The document prepared was submitted by the Ministry of National Development to the National Council of Sustainable Development for discussion.

Table 6. GI/EO authorities in Hungary

Mandate	Authority
The supervisory authority In the field of Geodesy, Surveying, Mapping, Remote Sensing, Land administration, geo-information and Earth Observation	Department of Land Administration and Geo-information of the Ministry of Agriculture.
Since 1 January 2017, the successor of FÖMI, providing a wide range of GI/EO services for users from citizens to private sector and from governmental agencies to academia.	Department of Surveying, Remote Sensing and Land Offices at the Budapest Capital Governmental Office
Services provided on sub-national level in surveying, mapping and land issues	Land Offices on County and District
Military mapping:	Geoinformation Service of the Home Defence Forces
Supervises the space research programs and major projects in Earth Observation and has wide range of international relations in EU and beyond with special emphasis on cooperation with national/ regional space agencies (e.g ESA) and intergovernmental organisations such as GEO and UN bodies	Hungarian Space Office at the Ministry of National Development

Some sectors and branches having geospatial capabilities are playing dominant role in achieving the Sustainable Development Goals include: potential cooperative partners, custodians of the reference and thematic data provided for and by the National Spatial Data Infrastructure in sectors such as the Water Management, Transportation, Meteorology, Geology, Energy, Soil. Screenshots of some thematic information systems are shown on Fig. 2.

Figure 2 Some thematic geospatial information systems used in Hungary



In standardization: Hungarian Standards Institution, Working Group on Geo-informatics MB818

Non-governmental Organisations: Hungarian Society of Surveying, Mapping and Remote Sensing (MFTTT), Hungarian Association for Geo-information, Gita Hungary

Market actors of the GI industry (private sector from start-ups up to SMEs)

They are many players who will be potentially involved in the achievement of SDGs taking active part in the target and indicator monitoring and or reporting to the Central Statistical Office (KSH) who will provide the reporting for UN.

Scientific and research labs, academic institutions, R+D workshops and the institutions of the higher education (Universities, Colleges) are significant importance driving also the international relations, cross-border or international projects and programs.

THE ENGAGEMENT OF STAKEHOLDERS CAMPAIGN IN HUNGARY

The Multi-stakeholder partnerships are part of the Sustainable Development Goal 17. The Resolution 70/1 of the UN General Assembly (25.9.2015) describes the related tasks (UN, 2015a):

"17.16 Enhance the Global Partnership for Sustainable Development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the Sustainable Development Goals in all countries, in particular developing countries

17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships"

Accordingly, in March 2017, an awareness raising campaign was launched by volunteer members of the Hungarian Society of Surveying, Mapping and Remote Sensing (MFTTT), actually the former and present national INSPIRE delegate as well as the national correspondent to the Group of Earth Observations (GEO) and liaison of the Global Spatial Data Infrastructure Association (GSDI) to the Working Group of Information Systems and Services (WGISS) of the Committee of Earth Observation Satellites (CEOS).

This action is in line with the firm commitment of the President of the 71st Session of UN who by taking his office on 13 September 2016 expressed his commitment to strengthen momentum for SDG implementation on the first place by "Raising the global public's awareness of the critical importance of SDG implementation. Now, the best start to begin it with awareness raising to engage the stakeholders.(Thomson, 2016).

Table 7: Awareness raising campaign of MFTTT to engage stakeholders at domestic and cross-border conferences and meetings on EO/GI/SDI for SDGs participated by representatives of governmental organisations, NGOs, academia, private sector (start-ups, Nano- and SMEs) as well as students.

Presentation at event of	Communities attracted	Participants
Day of the European Surveyors and Geoinformatics Budapest, 22 March, 2017 (Mihály et al, 2017a)	Surveyors, experts in geoinformatics	180
GIS Open 2017	Land Administration,	150

Székesfehérvár, 11-13 April, 2017. (Mihály et al, 2017b)	surveying, mapping, remote sensing, experts in geoinformatics	
18th Conference on Geodesy. Tușnad , 18-21 May, 2017 (Mihály et al, 2017c)	Geodetists, Surveyors, experts in geoinformatics	140
8th GIS Conference and Exhibition. Debrecen, 25-26 May, 2017. (Mihály et al, 2017d)	Experts in geoinformatics	150
31st Roving Conference of MFTTT. Szekszárd, 6-8 July, 2017 (Mihály et al, 2017e)	Land Administration, surveying, mapping, remote sensing, experts in geoinformatics,	170
Mini Conference Devoted to the 70th Anniversary of Prof. Béla Márkus. Székesfehérvár, 11 July, 2017 (Mihály, 2017)	Experts in geoinformatics from universities, colleges, students, private sector, governmental agencies and NGOs	45
Fény-Tér-Kép (Light-Space-Image) Conference Gárdony, 12-13 October, 2017 (Mihály et al, 2017f)	Experts in photogrammetry, remote sensing, Earth Observation, image processing, geoinformatics	100
Meeting with representatives of the National University of Public Service. Budapest, 7 November, 2017 (Mihály et al, 2017g)	Authoritive experts of 'Good State and Governance', state efficiency indicators, as well as sustainable development in areas water governance, climate change, food security, social capital, culture of sustainable living	

Documents are downloadable from the repository (Mihály et al, 2017h)

WIDER VISIBILITY OF THE EO/GI FOR SDGS-RELATED AWARENESS RAISING IN HUNGARY

Through the GSDI Association, which is Participating Organisation in GEO, has liaison with CEOS WGISS, reached special consultative status with UN ECOSOC, supports the UN Global Geospatial Information Management (UN GGIM) and active in the Geospatial Societies and Academic Network the Hungarian efforts promoting the EO/SDI for SDGs were mentioned in the GSDI's Liaison Report for the CEOS WGISS plenaries in 2017 hosted

by NASA and RADI in this year (GSDI, 2017a, GSDI, 2017b). It was highlighted by the column Insider's View of the GIM International magazine in its September 2017 issue (Remetey-Fülöpp, 2017b)
The MFTTT actions have been reported to the GEO EO4SDGS Team in August 2017, describing its contribution as follows: "Awareness raising to assist engagement of the geospatial and EO data stakeholders in the 2030 Agenda context. Three members of the Hungarian Society of Surveying, Mapping and Remote Sensing (MFTTT) decided to launch a volunteer-based awareness campaign, in form of a series of steadily updated and enhanced presentation, calling the attention of the geospatial and EO community on the SDGs-related challenges and opportunities."

FOLLOW-ON ACTIONS

The envisaged steps towards the achievements of tangible results in the stakeholders engagement incude a preparatory, introductory meeting with experts of the Sustainable Development and Resources Research Center at the National University of Public Service, where following the methodology of the periodically published Good State and Governance Report (NUPS, 2017), they are focusing on developing state efficiency indicators related to state reform priorities. Beside this, they are conducting research on sustainable development in areas water governance**,** climate change**,** food security**,** social capital**,** culture of sustainable living. The aim is to exchange of information and to discuss the feasibility how EO/geospatial information together with other data where location is matter, could be support the targets, indicators monitoring reporting including visualization based on spatial data infrastructure and services.
Another actions are anticipated with EO experts of the Hungarian Space Office of the Ministry of National Development, where the multi-agency and interdisciplinary project Earth Observation Information System (FIR) will be supervised (Zboray, 2017). Based on the deliverables of the recent GEO Week (Washington DC, 24-27 October, 2017) documents including the Strategic Implementation Plan of the GEO Initiative 18: Earth Observations in Service of the 2030 Agenda for Sustainable Development (EO4SDGs) will be reviewed and discussed with emphasis on the issue, how the existing and enhanced geospatial data infrastructure could support target indicator monitoring and reporting. Another issue to be addressed is the fact, that EO data, information infrastructure and integrated observations are applicable for the mitigation, adaptation and practical support of the implementation of the Paris Agreement, which was entered into force on 4 November 2016. (UN FCCC, 2016 At the UN Climate Change Conference (COP23) taking

place in Bonn, Germany, between 6-17 November, 2017, GEO is arranging side event and exhibition devoted to EO4ClimateChange.

CURRENT SITUATION OF THE IMPLEMENTATION OF INSPIRE AND NSDI

The purpose of Directive 2007/2/EC – known as the INSPIRE (Infrastructure for Spatial Information in Europe) Directive – is to lay down general rules aimed at the establishment, management and maintenance of the Infrastructure for Spatial Information in the European Community and of its computerised, Internet-based services, and to establish this infrastructure between 2009 and 2020 in order to ensure that the enforcement of Community policies, the coordination of the activities that have an impact on the environment, and the management of, and feedback from, the political mechanisms of action are smooth, simple and efficient.

The development and functioning of the information society requires the establishment, processing and use of immeasurable amounts of data. Spatial information is a tool of the information society which plays a crucial role in the improvement of processes and modernisation of services worldwide. The objective of the National Spatial Data Infrastructure (NSDI) is to systematise the tasks of this specific field. The development of the NSDI is especially timely in terms of the necessity to join the INSPIRE programme, i.e., the European spatial data infrastructure action.

A significant proportion of the data generated in the public sphere is data that can be related to spatial location, i.e. spatial data. In Hungary, these spatial data currently belong to more than one ministry or ministerial support institution. The harmonisation of these spatial data is incomplete and cooperation between the databases is a problem; therefore, we must establish the National Spatial Data Infrastructure, one basic element of which is Directive 2007/2/EC of the European Parliament and of the Council establishing an Infrastructure for Spatial Information in the European Community (INSPIRE).

Hungary is in the backdrop of implementation of the NSDI and the INSPIRE compared to EU Member States.

THE BOTTLENECKS RELATED TO NSDI IN HUNGARY

Currently, Hungary does not have a nationally harmonised National Spatial Data Infrastructure. Each field manages the data within their own scope of

action in accordance with the legal requirements but no rule is in force regarding their harmonisation.
Therefore, it needs to establish a standing committee to steer the operation of the National Spatial Data Infrastructure in order to ensure a more efficient use and harmonisation of the national spatial data and spatial information systems and in order to establish the National Spatial Data Infrastructure itself.

With the exception of certain data themes, the Hungarian data policy does not allow free data uses at the moment. This prevents cooperation between the different sectors of the State several times because the funds necessary to pay the data supply service fee are often missing.
Another obstacle is that the land administration sector does not receive funds from the central budget, which forces this sector to cover the costs of operating, maintaining and improving the land administration system from data sales revenues.

CONCLUSION

The INSPIRE Directive plays an important role in the establishment of the National Spatial Data Infrastructure of Hungary. The creation of a supporting Committee is necessary for the establishment of the National Spatial Data Infrastructure, for the monitoring of its operation and for the related reporting tasks of SDGs.
The National Spatial Data Infrastructure is the entirety of the spatial data, spatial information systems and registries managed by the State. The establishment of the National Spatial Data Infrastructure will allow an efficient and coordinated use of the spatial data and spatial information systems by the Government, which is indispensable for ensuring proper decision-preparation, for managing emergency situations, for establishing a better environmental status, for improving the quality of State services and for establishing a better service-providing State, which support of the SDGs.
Establishment of the National Spatial Data Infrastructure is necessary on the governmental level with the cooperation of the different Ministries and the Hungarian Central Statistical Office, with the involvement of the academy, the educational institutions, the private sector and the civil society organizations. It needs at the same time implementing a more favourable data policy at national level.

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