

RESPONSE TO THE CHALLENGES: THE FIRST TWO DECADES OF A NATIONAL GI ASSOCIATION (1994-2015)

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ABSTRACT

The 'big bang' of spatial data thinking began in the 90's, with the concept of multipurpose cadaster, along with advances in information systems, and operational applications of remote sensing, especially in agriculture and environment. All of these developments imperatively called for cooperation in: standardization; creation of interoperable spatial data infrastructures; capacity building; new models in data sharing; and strengthening the ongoing development of interdisciplinary Geographic Information (GI) communities at national, regional and global levels. This paper describes the circumstances that triggered establishment of Hungary's multidisciplinary Association for GI, HUNAGI, and brings to light the major stages of its evolution in the first two decades, namely the networking of domestic stakeholders, and the forging of links with novel international communities such as EUROGI, GSDI and later ISDE. According to HUNAGI's mission, the focus of their effort was to engage major players and arrange professional forums that together offered opportunities for its growing members to collaborate on international projects, promote their achievements, and facilitate dialogue and sharing of experiences. HUNAGI intensely communicated information on best practices and lessons learned, in areas of data policy, capacity building, legal aspects, and last but not least, promotion of innovative technologies applicable for societal benefits. All this was achieved by advocating the use of Spatial Data Infrastructure (SDI) and the Earth Observation (EO) data, as well as promoting the adoption of Acquis of the EU and sustainable development supported by geospatial and EO data.

Key words: HUNAGI, Networking, Spatial Data Infrastructure, Earth Observation, Sustainable Development.

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INTRODUCTION

The Anniversary General Assembly of the Hungarian Association for Geo-Information (HUNAGI) was devoted to recall the 25 years of the Association. Held in Budapest on November 8, 2019 the author (past Secretary-General of HUNAGI) delivered a lecture addressing the first 21 years, followed by a presentation given by the recent Secretary-General Dr. György Szabó, discussing the most recent follow-on years. This paper is a short retrospective of the period 1994-2015, in personal viewpoint of the author, who took an active part in the daily activities from the very beginning, at every level, from domestic to international, always aiming to achieve the goals defined by HUNAGI at the time of its establishment in 1994. The events, achievements and new challenges of the follow-on years are reflected by the Association's refreshed website (HUNAGI, 2015).

FLASHBACK ON THE HUNAGI ESTABLISHMENT ERA

To develop and operate a wide-range of GI-based, interoperable information systems and services for multipurpose societal benefit requires:

- an approved strategy,
- strong political support,
- visionary leadership,
- coordination,
- quality data, and
- interdisciplinary cooperation

In Hungary, the growing importance of geospatial information was recognized in the 90's by the State Committee for Technological Development (OMFB), in gathering the emerging GI communities of data suppliers, solution providers, industry, academia and end users, including governmental agencies. At that time, aside from the Geospatial Service of the Home Defense, government agencies and certain companies were already well-experienced in the use of GI, especially in the field of land administration, including the Department of Lands and Mapping in the Ministry of Agriculture and Regional Development (MoARD), the Institute of Geodesy, Cartography and Remote Sensing (FÖMI), the Land Office network. Some universities made significant efforts to develop expertise in GIS as part of their core curricula and in assisting development of applications for industry (Table 1.).

Table 1. Some major actions in the 90's, where the government promoted and supported GI-related developments

Action	Location, date	Features
Computerisation of the Land Offices under EU Phare and Twinning framework	Countrywide in the 90's	Under the leadership of the Department of Lands and Mapping at Ministry of Agriculture and Rural Development (MoARD)
Establishment of AM/FM GIS Hungary, lead by Dr. L.Csemniczky supported by OMFB	Budapest 1991	With focus of development on geospatial technology applications for utilities
Study on the applicability of spatial data and related services	Budapest 1992	Lead by the State Office for Technological Development (OMFB)
International Workshop devoted to GIS in local governments and urban data management	Budapest 1993	Arranged by OMFB, with experts from local governments from USA, Denmark and Hungary
Launch of GIS projects for local government	Countrywide 1993-	Orchestrated by OMFB
Annual Central European GIS/LIS Conferences supported by OMFB	Budapest, 1993-1996	Participated by leading international experts in GIS/LIS from European institutions, organisations and EU member states
As a Hungarian GI landmark, establishment and use of the national Digital Base Map, related standards, and continuing remote sensing programs with apps in agriculture and environment	Countrywide in the 90's	Act on Surveying and Mapping Activities. Line Ministries (MoARD and MoHD) Assigned flagship institution: Institute of Geodesy, Cartography and Remote Sensing (FÖMI) Base map standards MSZ 7772-1:1997 and MSZ 7772-2:2000 issued by the Hungarian Standard Organisation
Textbook on GIS of the Budapest University of Technology	Budapest 1994	Authors: Prof. Ákos Detrekői and Asst.Prof. György Szabó
Translated and extended Hungarian version of the NCGIS Core Curriculum	Székesfehérvár 1996	Edited by Prof. Béla Márkus Director of Faculty of GEO University of Sopron

INFLUENCING CIRCUMSTANCES LEAD TO THE ESTABLISHMENT OF THE NATIONAL GI ASSOCIATION

Some triggering impacts from the EU side included:

- The White Book of Jacques Delors on Competitiveness, Employment and Growth published by the European Commission in 1994
- The Bangemann Report discussing the importance of SDI, 1994
- European Commission (EC DG XIII) facilitated the setting up of the European Association for Geographic Information (EUROGI), 1993
- Under the patronage of Prof. Martin Bangemann (EC DG III) and Bruce Babitt (DoI, USA) the Global Spatial Data Initiative (GSDI) has been created and collaboration between North-Carolina and Northrhine-Westfalia on SDI started in 1993-94, and
- Establishment of national/regional GI associations in Ireland (IRLOGI), Germany (DDGI), Nordic countries (GI Norden). The European Association of Remote Sensing Companies (EARSC) was set up also in 1994. In the same year the Hungarian Association for Geo-information (HUNAGI) was launched with governmental (OMFB, MoARD) support. The British AGI was taken as foregoer.

Hungary's domestic environment was favorable and supportive as well:

- Some academic societies, NGOs, the Hungarian Space Office and the HUNGIS Foundation realized their mutual interest in 1994 to form a National GI association under the auspice of OMFB. One aim was to join the just established EUROGI and serve as an international arm of HUNGIS Foundation.

Champions included Minister without portfolio, Prof. E. Pungor, S. Bottka, V. Bognár all of OMFB, M. Havass of Federation of Societies of Technical and Natural Sciences, Academician Á. Detrekői of Budapest University of Technology and Economy/ Hungarian Academy of Sciences/HUNGIS Foundation), T. Tenke of Geometria Ltd. and R. Berencei of HUNGIS Foundation provided notable support.

FEATURES OF THE ASSOCIATION AND MISSION GOALS

The inauguration meeting was held in November 1994. HUNAGI was then established as an interdisciplinary umbrella organization, with the stated mission goal to promote, stimulate, encourage and support development and use of GI, associated technologies and related services, as well as to strengthen

the institutional links between GI communities in Hungary and abroad via the European Umbrella Organization of Geographic Information (EUROGI). Preparing the legal establishment of the Association, the following founder organizations participated the General Assembly in November 1995:

- Hungarian Space Office (HSO),
- HUNGARNET Association
- Hungarian Association of Public Administration Informatics
- Technology Transfer Centre (TTC)
- Association of AM/FM GIS Hungary
- Hungarian Society of Settlement Developers and Renovators (MTFT)
- University of Forestry and Timber, Faculty of Surveying and Land Consolidation (later: University West Hungary Faculty of Geoinformatics)
- HUNGIS Foundation for the GIS in Hungary
- Hungarian Society for Urban Planning (MUT)
- John von Neumann Computer Society

Objectives of the Association (revisited in 2007) include: to represent the interest of the Hungarian GI community in EUROGI, to build bridges with other similar associations, to strengthen the competitiveness its members by providing information dissemination service, forging the cohesion between the geospatial data and solution providers, GI users of government, academia, industry and civil sector, as well as to elaborate GI strategy and other background documents applicable in decision making. and contributing to the tasks derived from Hungary's membership in the European Union.

Motivating external drivers included the National Program of Adoption of the 'Acquis Communautaire', the common rights and obligations that are binding on all EU countries (to ensure readiness for EU accession in 2004), the acceleration of developments in Information and Communication Technology (ICT), the challenges of the digital transformation towards an information society, and the Big Data era impacted the GI/EO field largely from locational based services to EO apps. Special emphasis was given to open source software, data sharing and knowledge-transfer by collaboration in combining best practices and lessons learned. Together this paved the way for implementation of the European data-sharing legislative frameworks, INSPIRE for SDIs and Public Sector Information/Open Data directives. HUNAGI accessed to the European Network on Geographic Information Enrichment and Reuse (eSDI-Net+ in 2007. The rise of the Association and the setbacks caused by the financial/economic recession after 2008, is reflected in Figure 1. Significant number of members had to leave. But,

despite this, the activities grew, thanks to the Association’s inspired and committed leadership and their resilience to these changes.

Stages of the domestic GI networking by HUNAGI

Positive impacts

- OMFb’s GIS projects
- Enthusiasm and commitments of founders
- Membership in EUROGI and best practices in Europe
- HUNGIS Foundation
- ICT programs of the Gov’t
- Support of the line ministries, OMFb and Met Service
- Nat Program of the Adoption of Acquis Communautaire
- Open and inclusive policy

Negative impacts

- Financial/economic crisis in 2008 and follow-on recession
- Frequent institutional changes and reorganisations

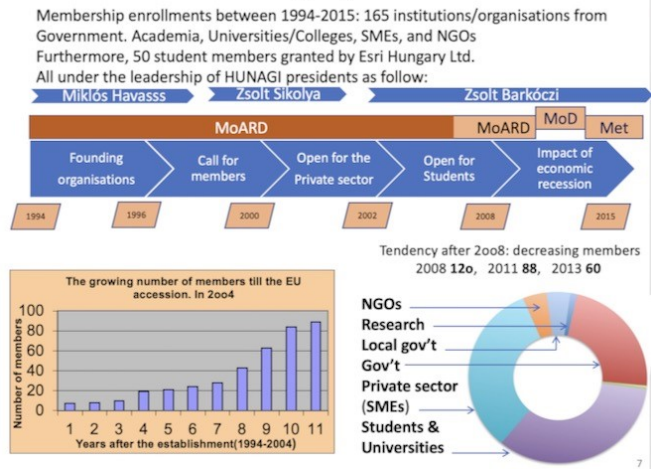


Fig. 1. Impacts on the growth and supportive governmental bodies

SETTING UP INTERDISCIPLINARY PARTNERSHIPS

The inclusive nature of HUNAGI became a major strength that steadily expanded collaboration with domestic activities. The areas covered by these partners range from land management to Earth Observation, and from location-based services to urban/regional development, as illustrated in Figure 2. Then in 2001, there was a comparative analysis of EUROGI, based on models of national GI associations in Europe in assessing five entities: AGI-UK, DDGI- Germany, HUNAGI-Hungary, RAVI of the Netherlands and AFIGÉO-France. In the case of HUNAGI, it was acknowledged by the project lead, Koen van Biesen, how effective such as HUNAGI can be, even with limited resources.

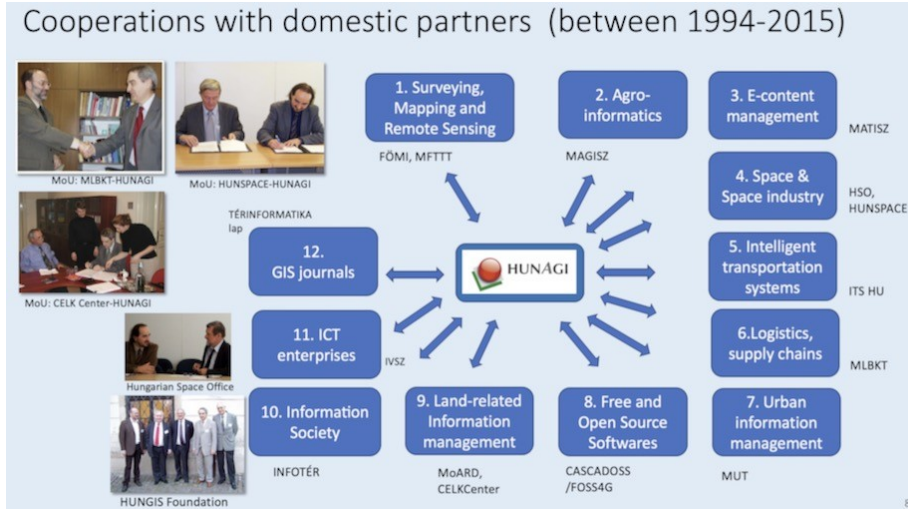


Fig. 2. Horizontal partnerships with NGOs, learned societies governmental agencies and space industry cluster.

Partnership activities included (with organization in brackets) arranging joint seminars (MLBKT), international workshops, fora (FÖMI, HUNSPACE), study works (HUNGIS, KPMG, COWI), contributions to conferences/exhibitions (CELK Center, MUT), drafting legislation (MoARD), advocate promising, innovative technologies (ITS Hungary), encouragement to publish in journals (MFTTT, MAGISZ) and represent HUNAGI in the governmental space research council (appointed by HSO) and Hungarian Standard Organisation’s Subcommittee on GIS (MSZ) via MoARD.

FORGING LINKS AND COLLABORATION ON REGIONAL AND GLOBAL SCENES

According to the strategy revisited yearly by the general assembly of HUNAGI, the Association made steady progress to strengthen its international links. Consequently, HUNAGI became a member of four organisations as follows (includes year of enrolment):

- Geographic Information Systems International Group - GISIG (Genova, Italy), 1995- (A highly successful coordinator of EU projects having 100+ members across Europe)
- EUROpean umbrella Organisation for Geographical Information - EUROGI (Amersfoort, The Netherlands), 1996- (Leading interdisciplinary NGO in GI in Europe). See Figure 2.

- Global Spatial Data Infrastructure Association – GSDI (Orono, Maine, USA), April 2005– April 2018 (HUNAGI participated the world conferences of GSD Initiative since 1996). See Figure 3.
 - International Society of Digital Earth - ISDE (Beijing, China), 2006- (HUNAGI participated ISDE symposia since 2003).
- Moreover, the Association signed the international 3D Ethics Charta in January 2015 and maintained working contact with ISPRS, FIG and the GI Working Group of the United Nations.

Established international links- EUROGI

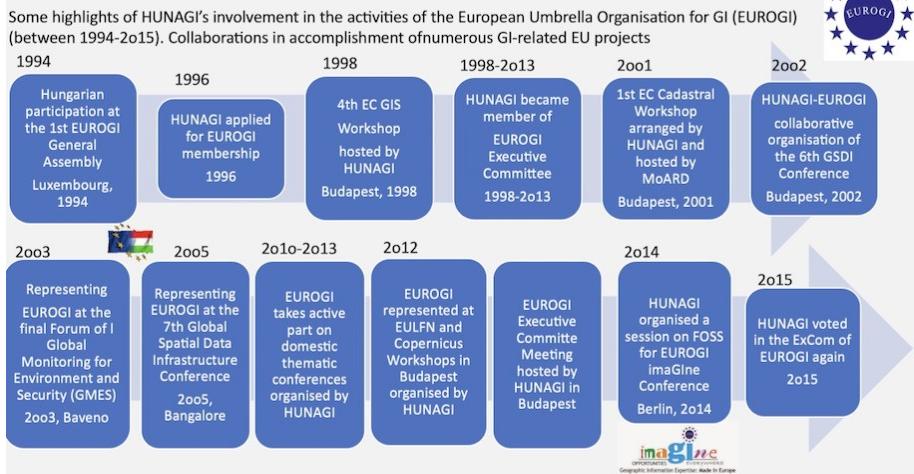


Fig. 3. HUNAGI participation in EUROGI activities and some related actions

Full membership in EUROGI meant that HUNAGI was being updated every Members' Day on the achievements of other national GI associations. So HUNAGI was informed of plans and efforts by the European Commission (EC) at an early stage. The jointly articulated feedbacks/messages of the GI community became even more effective at the Annual General Meetings held in Brussels, in presence of civil servants of EC. As an advisory partner of EC, EUROGI elaborated several thematic trend-analysis (since 2014) for National use and for European institutions. EUROGI led or participated with its members on numerous GI-related EU projects and joint actions, where members of HUNAGI benefited, including GIS/LIS Central Europe, PANEL-GI, ABDS, 4th EC GI/GIS, 1st EC Cadastral Workshop, E-ESDI/INSPIRE, GSDI-6, GINIE, HUMBOLDT, ETEMII, CEE-SDI, ePSI Platform, eSDI-NetPlus, EURADIN, LAPSI, European Location Framework (ELF), and Copernicus Market-Pull-Pack (MPP).

As far as HUNAGI membership in GSDI Initiative, and later in GSDI Association is concerned, representatives took part and contributed in most case, by delivering presentations on HUNAGI at GSDI's world conferences in addressing the following themes (also see Figure 4):

- The Emerging GSDI (1996)
- Towards Sustainable Development Worldwide (1997)
- Policy and Organizational Frameworks for GSDI (1998),
- Engaging Emerging Economies (1999)
- Sustainable Development: GSDI for Improved Decision-Making (2001)
- From Global to Local (Budapest, 2002),
- Spatial Data Infrastructures for a Sustainable Development (2004)
- The Role of SDI's in an Information Society (2005)
- Geographic Information: Tool for Reducing Poverty (2006)
- The Role of Spatial Data in Supporting a Sustainable Future (2008)
- Building SDI Bridges to address Global Changes (2009)
- Realising Spatial Enabled Societies (2011)
- Spatially Enabling Government, Industry and Citizens (2012)
- Spatial Enablement in a Smart World (2016).

Two strategic meetings were arranged in Cambridge (UK) between 1999-2000 to set up the policy and organizational framework needed for the establishment of GSDI Association, where HUNAGI was invited, as well as to the Think Tank Meeting on the topic SDIs and Cultures organized by GSDI and the Atlantic Institute hosted by MIT in 2005. This particular meeting was participated in by some pioneers of the multipurpose cadaster, a concept which is considered to be the cradle of the spatial data infrastructure.

GSDI was represented by HUNAGI at the plenaries of the Working Group Information Systems and Services of the Committee on Earth Observation Satellites (CEOS WGISS) between 2006-2015 and at the plenaries, workshops of the inter-governmental Group on Earth Observation (GEO – hosted by UN WMO) between 2007-2015.

After 2015 GSDI led the UN GGIM Geospatial Societies (earlier the Joint Board of GI Organisations) and closed the operation of its own association, the tasks of which were essentially taken over by the UN GGIM, the UN Committee of Experts on Global Geospatial Information Management.

Doug Nebert’s SDI Cookbook and the GSDI small grants, supported promising SDI applications that attracted worldwide attention by the GI communities, including that of Hungary. One of the winners was the Institute of Ecology and Botany of the Hungarian Academy of Sciences (HAS).

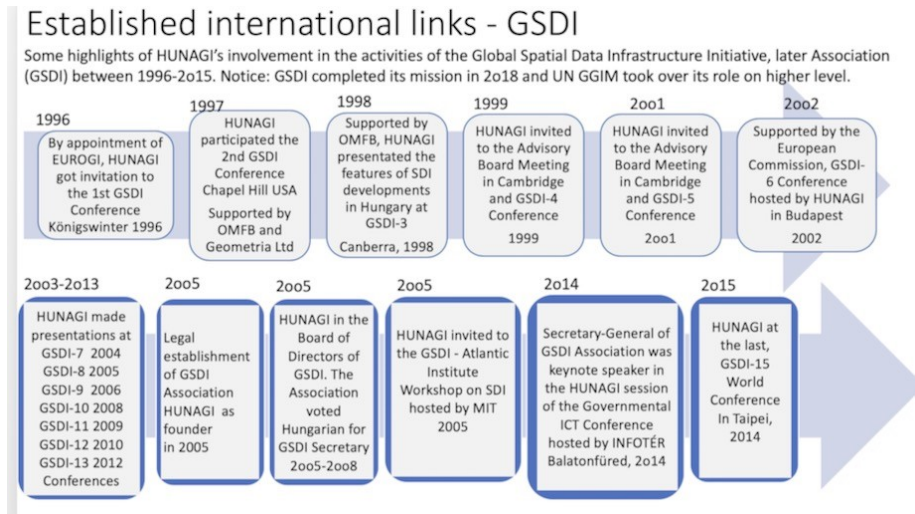


Fig. 4. HUNAGI contribution to the activities of the GSDI Association

In line with the strategy of HUNAGI, the International Symposia on Digital Earth (ISDE) attracted HUNAGI and some its members, in large part due to the visionary concept Al Gore made in 1998, and the proactive support of that idea by the Chinese Academy of Sciences (CAS) based on the principles of the Beijing Declaration on Digital Earth in 1999. Thereby, ISDE promoted international cooperation on the development and realization of Digital Earth (DE) vision and the enabling of technologies in accessibility and usability of information in the georeferenced, virtual representation of the Earth.

HUNAGI in the International Society of Digital Earth (ISDE)

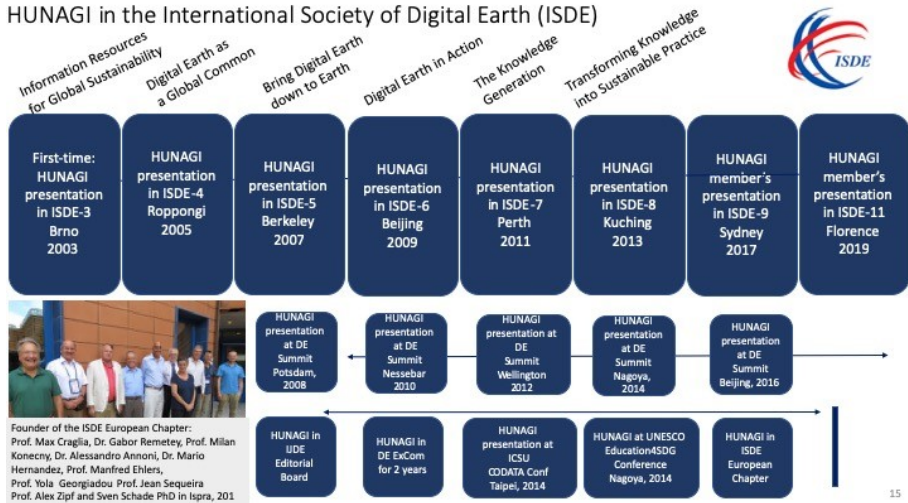


Fig. 5.: HUNAGI contribution to ISDE activities by reporting and sharing on applications of DE technologies

The idea was that this would help the digital transformation towards the knowledge-based information society, and play a major role to meet the challenges (e.g. sustainable development) from local to global. HUNAGI, FÖMI and CELK Center, took part in the ISDE Symposium, held for the first time in Europe in 2003.

During the next 12 years and beyond, HUNAGI played an active role in the ISDE activities, while also supporting the Executive Committee and the International Journal of Digital Earth. Some HUNAGI members and partners, including the Budapest Corvinus University, MoARD, Institute of Soil Sciences of HAS and Debrecen University, engaged with the DE community work. Meanwhile, in 2006 the International Society of Digital Earth had been established in Beijing and hosted by CEODE (later RADI, today AIRI) of CAS. The original concept was revisited by a task force in 2011 that elaborated ‘Digital Earth Vision towards 2020’ and was published in the Proceedings of the National Academy of Sciences (PNAS USA) and Int’l Journal of Digital Earth (IJDE, Beijing). Most recently the presidency of ISDE has been taken over by Alessandro Annoni, one of the INSPIRE Directive leaders, who also became head of the Digital Earth and Reference Data, and the Digital Economy units at the European Commission Joint Research Centre, JRC. HUNAGI’s involvement in the DE Symposia and Summits is shown in Figure 5.

RESPONSES ON THE DEMAND OF THE DOMESTIC GI COMMUNITY

Building bridges abroad

The office of HUNAGI was hosted in its first 13 years by the Lands and Mapping Department of MoARD. Many actions of the Association had the aim to support the international relations of the land administration. Based on links with UN ECE MOLA (later to become the Working Party of Land Administrations -WPLA), HUNAGI cooperated with JRC and EUROGI to host the first International Workshop on Cadastre of the European Commission in 2001 a year before the 1st Cadastral Congress in the EU as arranged by Spain, where EUROGI disseminated a report on the state of the art for digital cadasters in Europe, compiled by HUNAGI. MoU-based cooperation with the highly successful Central European Land Knowledge Center (CELK Center - a joint venture of MoARD and the World Bank) enabled knowledge transfer in the region and gathering LIS/GIS experts from the Baltics to the Balkans, and from France to the Caucasus. HUNAGI paved the way for MoARD to take part in the work of the Permanent Committee on Cadastre of the European Union.

Participation in preparation of INSPIRE (the legislation framework of the European SDI)

Thanks to the GSDI Association, HUNAGI was invited by EC to the INSPIRE Expert Committee in 2001. Later, at the INSPIRE Meetings hosted by the European Commission and European Council, Hungary was represented by the Ministry of Environment and MoARD, while for the INSPIRE Technical Drafting Groups, HUNAGI assisted to encourage Hungarian experts to participate. HUNAGI arranged the National INSPIRE Days as hosted by FÖMI. HUNAGI was acknowledged as part of the Spatial Data Interest Community (SDIC) by the Joint Research Centre in 2009. In addition to JRC, the Association forged links with other European Institutions, including DG Envi, DG Research and EUROSTAT.

Additional activities included: building bridges with neighbor countries, i.e., participation in Exhibitions in Urban GIS and Centropa workshop in Schwechat, AGEO meetings held in Vienna, GIS Conferences in Cluj, Romania, together with HUNGIS Foundation and Dennis Gabor College.

Actions in the V4 framework and in the South-East Europe region

HUNAGI was invited by CZAGI and SAGI in a project called GRAPPY, but the project proposal was not granted. HUNAGI participated in another V4 project proposal, CASCADOSS, based on an open source theme that successfully applied for the grant. As far as the Balkan region is concerned, HUNAGI took part with presentations in ICA, SEE SDI and ISDE meetings in Bulgaria, a World Bank conference in Serbia, SDI meeting in Northern Macedonia (organized by Geo-SEE), WPLA Meeting in Albania, ISPRS, UNGIWG, GEO SEE meetings in Istanbul as well as FIG and SDI workshops in Greece. An interesting project idea was elaborated by EUROGI and HUNAGI to apply a novel, Data Cube approach for the multi-country cooperation along the River Danube. The concept attracted positive attention by JRC in Ispra, by ESA and even by the EC's Danube Conference in Ulm. But due to the lack of preparedness and engaged key players, this 2015 project proposal failed. Some years later a similar Data Cube project was launched for the Mekong Basin supported by CEOS and managed by the Vietnam Academy of Science and Technology (VAST).

Collaboration with UN institutions and working groups

Invited by Presidents of HAS and the National UNESCO Commission, HUNAGI took part in the 2-year work of the National Committee of the International Year of the Planet Earth. Important activities were related to the UN Geographic Information Working Group where, by invitation, HUNAGI contributed several times to this work at plenary meetings of GI experts of UN agencies. Advocating by HUNAGI, the Gyöngyös Campus of Eszterházy University became a member of OGC. In 2006, as recommended by top FAO experts, HUNAGI arranged to set up the third UN SDI National Coordination Office, after those in Netherland and Spain. The mandate was received to run the UN Spatial Data Infrastructure Hungarian Coordination Office (UNSDI-HUCO) from the leading stakeholders at a Meeting jointly organised with and hosted by FÖMI on 28th September 2006. The UNSDI-HUCO stakeholders were the following organisations and institutions:

- Hungarian Association for Geo-information
- Hungarian Meteorological Service (OMSZ)
- Hungarian Space Office,
- Ministry of Environment and Water
- Institute of Geodesy, Cartography and Remote Sensing (FÖMI)
- Hungarian Geological Institute
- Mapping Service of the Hungarian Defence Forces
- Ministry of Defence Mapping Company
- Ministry of Economy and Transport
- National Directorate General for Disaster Management
- Research Institute for Soil Science and Agricultural Chemistry of HAS
- University West Hungary Faculty of Geoinformatics
- VÁTI Hungarian Public Non-profit Company for Regional Development and Town Planning
- Department of Natural Resources, Ministry of Agriculture and Rural Development
- Department of Land Administration and Geoinformation, Ministry of Agriculture and Rural Development

The global meeting of the UN SDI stakeholders was held at ESA in Frascati. Although the elaborated UN SDI study was discussed there, another concept supported by the regional surveying, mapping and cadastral associations (such as EuroGeographics) was accepted, followed by the establishment of the UN GGIM in 2011. This expert community continues to work efficiently, providing support to implement the Sustainable Development Goals of the UN 2030 Agenda and advocating the necessity of integrating EO/geospatial data and statistical information to improve decision-making procedures.

EO-oriented actions where HUNAGI, its members and partners played roles

Along with the NGO HUNGEO, HUNAGI's links to the Ministry of Water and Environment (MoWE) facilitated the opportunity to host two CEOS Working Group meetings on Information Systems and Services (WGISS), and Calibration Validation (WGCV) in 2006. After HUNAGI gave a 30 minutes presentation on GSDI, and the Hungarian GI/EO community was introduced in frame of an arranged special session participated by the top Hungarian governmental players from HSO to Meteorological Service and from the Geological Institute to MoARD, and the flagship programmes of FÖMI and

MoWE, the Chairs of WGISS and Executive Director of GSDI Association agreed to set up permanent liaison between the two communities, via HUNAGI. This tremendous partnership enabled HUNAGI to deliver liaison update records on GSDI developments almost twice a year until 2018, and later on by the Hungarian Space Office (HSO), which is today the Department of Space at the Ministry of Foreign Affairs and Trade (MFA).

GSDI realized the importance of Earth Observation and the role of the inter-governmental organization GEO in the SDI context and therefore delegated Esri, the Federal Geographic Data Committee (FGDC) and HUNAGI, members from its board of directors, to represent the GSDI Association at GEO plenary and ministerial-level meetings organized by GEO Secretariat. HUNAGI received the mandate, in some cases, to lead the delegation, as well as participating in compilation of GSDI statements for GEO plenaries from 2007 on. All these activities were reported for the HUNAGI community. Especially the XIIth Ministerial Meeting of GEO was a milestone, where the continuation of GEO was agreed and the GEO Initiative 'EO for the Sustainable Development Goals (SDGs) had been launched. A volunteer group of the HUNAGI member MFTTT (Hungarian Society of Surveying, Mapping and Remote Sensing) was formed to keep contact with the GEO EO4SDG with the aim to raise awareness in domestic decision-makers for how essential the EO/geospatial data and integrated statistical information are in facilitating implementation of the SDGs (Mihály, 2017).

The NASA Ames Research Center- Politecnico Milano-HUNAGI collaboration began in 2012 with Patrick J Hogan, NASA World Wind (WW) program manager and Prof. Maria A. Brovelli, a GIS leader promoting opensource and also ISPRS personnel of the Politecnico di Milano, Como Campus. The objective was to demonstrate WW capabilities in analysis and visualization of open source applications. The strategic design of the Europa Challenge for students and young professionals came about via brainstorming with NASA developers in Como in concert with GIS by experts from around the world. Hungarians from Budapest University of Technology, FÖMI, St. Stephen University, Hungarian Geological Institute were present. The yearly WW Europa Challenge (WWEC) was promoted worldwide and the Crystal Bull Award ceremony was integrated as part of the INSPIRE Conference (Florence, 2013), the European Conferences on Free and Open Source Software hosted by the Jacobs University in Bremen (2014) and the Politecnico Milano, Como Campus in 2015, with an even larger group of Hungarians, led by Dr. Zoltán Siki, mentor of WWEC participant Krisztián Takács. HUNAGI members served as WWEC judges from the beginning until 2018, the last WWEC.

Domestic tasks and projects accomplished include

As a GSDI member, HUNAGI was invited to deliver a presentation at the 1st World Summit on Information Society of the United Nations in Geneva participated by 175 countries and Organisations (2003). One year later, HUNAGI intervened in the interest of the GI community at the Strategic Planning Meeting for the Information Society supervised by the Ministry of Informatics and Communication. Their contribution was to elaborate an SDI Strategy for Hungary. It was accepted, giving HUNAGI the mandate to start with the work of interagency collaboration with 14 agencies and organisations participating. The National SDI Strategy was completed and presented to the Committee of Geodesy and Geoinformatics of HAS by Dr. László Alabér, and submitted to the Ministry of Informatics and Communications in 2006, just before this Ministry was disbanded by the government due to institutional reorganization. At the annual National Civil Parliament in 2012, the HUNAGI proposals were approved. HUNAGI contributed to the EU Social and Economic Committee at its meeting in the Hungarian Parliament. After 2014, the Association was then invited regularly to the annual conferences devoted to government-related ICT developments, organized by the NGO INFOTÉR. This enabled HUNAGI to establish closer links with the National Council for Telecommunications and Informatics (NHIT) and the ICT Association of Hungary (IVSZ).

Some domestic projects enabled HUNAGI to work with the State Audit Office, the Ministry of Water and Environment, the Budapest Transportation Center, and the Local Government of Törökbálint. Assistance or networking support was provided to MoARD, FÖMI or Celk Center in association with the Phare program on Computerization of the Land Offices, the National Program of Adaption of Acquis Communautaire (NPAAC) including the Control with Remote Sensing (CwRS) and the Land Parcel-based Information System (LPIS/MePAR) of the EU Integrated Agricultural Control System (IACS), Action for Cooperation in the field of Economics (ACE), VineyardGIS (VINGIS), and with the West Hungary University in OLLO, SDILA and NatureSDIplus. HUNAGI assisted to arrange participation of MoARD at the final GINIE Conference on Under State-Secretary level and paved the way for a study tour in the USA with top decision makers of MoARD and FÖMI with the aim to visit the Cartographic Division of UN, the Map Archive of the Library of Congress, the FGDC at USGS and the World Bank.

HUNAGI and its members participated many of the annual GITA and Fény-Tér-Kép (Light-Space-Image) Conferences organised by GITA Hungary and

GeoIQ Ltd devoted to AM/FM and remote sensing/ image processing respectively Some domestic events arranged or assisted by HUNAGI and its members between 1995-2015 include:

- CERCO (today: EuroGeographics) General Assembly (1995)
- 4th EC GIS Workshop Budapest (1998)
- ISPRS Commission VII Symposium (1998),
- 1st EC Workshop on Cadastre (2001)
- GSDI-6 World Conference ‘From Global to Local’ Budapest, (2002),
- European Agricultural Informatics Conference, Debrecen, (2003)
- CEOS WGISS-21 and WG Calibration and Validation Meetings Budapest (2006)
- 1st HUNAGI Conference on ‘Spatial Data Management with Open Access’ Budapest, (2010)
- 2nd HUNAGI Conference on ‘Harmonisation of Spatial Planning Data – best practices in EU regions and municipalities’ with Plan4All-JRC-EUROGI. Budapest (2011)
- CEOS WGISS-32 Meeting Budapest (2011)
- HUNSPACE-HUNAGI Space Forum Visegrád (2011)
- 3rd HUNAGI Conference with Exhibition on ‘Mobile GIS and Related Data Services’ (2012)
- ESA-HSO Space Exhibition (2013)
- 4th HUNAGI Conference devoted to ‘What we can do with GI/EO for a more liveable environment?’ (2013)
- EU Location Framework Workshop Integration of location in e-Government’. Budapest, (2013)
- Copernicus MPP Workshop Budapest, (2013)
- Copernicus MPP Survey (for Hungary, completed by Dr. Szabolcs Mihály INSPIRE Coordinator) (2013)
- Innotrend Conference. Budapest (2014)
- Challenge on Mobile Apps with Awards. Balatonfüred, 2014
- INFOTÉR Conference. Balatonfüred (2014)
- Conference on ‘Integrated geo-spatial information technology and its application to resource and environmental management towards GEOSS’ (IGIT) Székesfehérvár (2015).
- Legal Aspects of Drones. International Conference Budapest (2015)
- ESA Accession Event Budapest (2015)
- GIS Open Székesfehérvár (2015)
- GIS Conferences and Exhibitions Debrecen, (2014-2015)

Visibility and communication

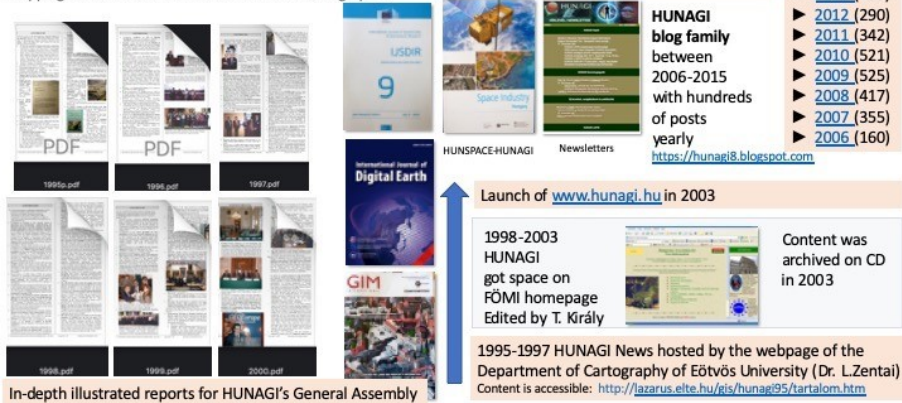
From the very beginning, the Internet was used to strengthen visibility and ensure communication with the GI community, both domestically and

internationally. Between 1995-1998 the Eötvös University Department of Cartography and Geoinformatics hosted information on the activities of HUNAGI, while FÖMI provided space on its website from 1998 to 2006, but this service was then terminated. The rich HUNAGI content created during that very significant time period is still available today, but via external storage only. Although HUNAGI established its own website in 2003, due to lack of resources the former content was never uploaded again (HUNAGI, 2015) To use Internet capabilities more effectively, a thematized blog system has been set up to address the major issues of the elaborated draft for a National Strategy of Implementation of SDI. This blog system is still accessible (HUNAGI Napló 2006). During 2006-2015 more than 3000 news, actions, reports and links have been posted, and all can read in foreign languages using in-built machine translator. The blog content for the period of 2006-2015 is frozen in time and can be considered an archive. See Figure 6.

HUNAGI used the opportunity at domestic/international meetings, conferences, exhibitions to disseminate permanently updated leaflets, brochures introducing the Association with its mission goals and objectives, its members, and the previous year's retrospective activities, in Hungarian or English, depending the event. Several hundred of double-sided A4 format leaflets have been compiled and printed. Newsletters were circulated for the vast number of interested list members on regular basis. HUNAGI's visibility was strengthened by the fact that HUNAGI, as an affiliate, was on editorial boards or as the co-editor for special issue in journals such as *Geodézia és Kartográfia* (Budapest), *GIS* (Heidelberg), *GIM International* (Lemmer, NL), *IJSDIR* (Ispra), *IJDE* (Beijing), *JoAgricultural Informatics* (Debrecen, later Budapest), *Geocarto International* (Abingdon, UK), *MMM-GI* (Skopje). HUNAGI actions were reflected by *INSPIRE Forum* (Ispra) and the popular journals *Térinformatika* (Budapest), *GEOConnexion* (UK) and *Geomatika* (Budapest).

Visibility and communication (1994-2015)

Annual reports, brochures, event-tailored leaflets on the activities of HUNAGI. In some cases, contribution to the Annual Report of the National Mapping and Cadastral Administration for EuroGeographics



+ Journal of Agricultural informatics
 MMM - GI
 Térinformatika
 Geocarto International

HUNAGI Log
 ▶ [2015](#) (191)
 ▶ [2014](#) (229)
 ▶ [2013](#) (255)
 ▶ [2012](#) (290)
 ▶ [2011](#) (342)
 ▶ [2010](#) (521)
 ▶ [2009](#) (525)
 ▶ [2008](#) (417)
 ▶ [2007](#) (355)
 ▶ [2006](#) (160)

HUNAGI blog family
 between
 2006-2015
 with hundreds
 of posts
 yearly
<https://hunagi8.blogspot.com>

HUNSPACE-HUNAGI Newsletters

Launch of www.hunagi.hu in 2003

1998-2003
 HUNAGI
 got space on
 FÖMI homepage
 Edited by T. Király

Content was
 archived on CD
 in 2003

1995-1997 HUNAGI News hosted by the webpage of the
 Department of Cartography of Eötvös University (Dr. L.Zentai)
 Content is accessible: <http://lazarus.elte.hu/pis/hunagi95/tartalom.htm>

In-depth illustrated reports for HUNAGI's General Assembly

Fig. 6. Communication was effective tool to keep contact with its GI community

CONCLUSIONS

During its first two decades of operation, HUNAGI achieved the major goals of the founding organizations. The Association established productive relationships not only with the major domestic players of golden triangle, government academia and industry, but also built bridges and became an internationally acknowledged organisation, thanks to the collaboration with EUROGI, GSDI and ISDE.

HUNAGI successfully assisted to accomplishing governmental tasks at the international level, from land administration to Earth observation, and from INSPIRE to networking, and in engaging stakeholders at all levels. For the benefit of its members, HUNAGI encouraged participation for dealing with ICT developments, novel technologies (e.g. IoT, drones, LIDAR, EO, Data Cube, Big Data solutions, cloud services) and increasing awareness of the needs of government. HUNAGI's efforts to engage students and young professionals, by challenging them to take an active role in providing real solutions serving real needs were productive steps to advocate the sharing of spatial data and solutions with the communities from local to global. HUNAGI well represented the data sharing principle of INSPIRE, GEO and ICSU CODATA. These efforts accentuated the common nature of solutions of the global community as well.

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