United Nations GGIM

Working Group on Trends in National Institutional Arrangements in Geospatial Information Management

United Nations Committee of Experts on Global Geospatial Information Management
5th session
New York, August 2015

Antonio Arozarena
UNGGIM NIA Chair
Instituto Geográfico Nacional. Spain
aarozarena@fomento.es

Positioning geospatial information to address global challenges

UN-GGIM | United Nations Committee of Experts on
Global Geospatial Information Management

ggim.un.org

INDEX

UN-GGIM | United Nations Committee of Experts on
Global Geospatial Information Management

Positioning geospatial information to address global challenges
ggim.un.org

1. Background

- UN-GGIM mandate to create NIA Working Group to identify best practices in National Institutional Arrangements in their **productive and operational, financial, legal and political aspects** (2014)
- 3 Task Groups (TG) have been established:

	1. Geospatial Information (GI) business model analysis
TG1	1.1 GI production systems analysis
TG2	1.2 Funding structures in Geospatial Information
	1.3 Dissemination systems in Geospatial Information
	1.4 Data policy models
TG3	**2. Structure of Geospatial Information Management Organizations**
	3. The role of people as users and producers of GI (Volunteered Geographic Information, VGI)

2. Task Group members

Task Group 1	Task Group 2	Task Group 3
Spain	**Mexico**	**Singapore**
France	Austria	Austria
Italy	France	Bangladesh
South Korea	Italy	Belgium
Singapore	Jamaica	France
	Singapore	Guyana
	Spain ISPRS CSIRO	Japan South Korea Carlton University GSDI CISRO

3. NIA Work Plan

Common Phases for all TG1 /TG2/TG3

Analysis activities of the state of the art in each area.	Done
Diagnosis of the current situation.	In progress
Identification of best practices.	To be finished in February 2016
Consultation among groups and NIA WG	
Preparation of technical papers and reports	

For { Analysis / Diagnosis } ➡ **Questionnaires** were prepared
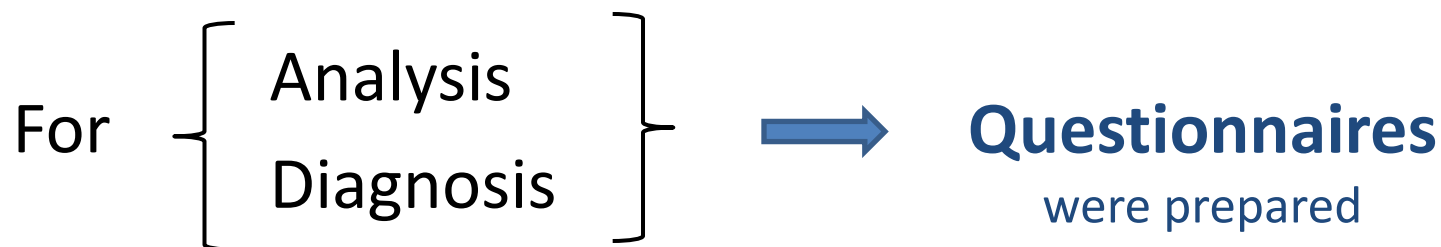
Questionnaires

Task group	Questionnaire	Circulated from
TG3	- Structure of Geospatial Management Organizations	20 Jan - 27 Feb 2015
Combined questionnaire TG1-TG2-TG3	- Production systems of Geospatial Information (GI)	25 Feb - 27 Mar 2015
	- Funding systems, dissemination and data policy of Geospatial Information	
	- Role of citizens as users and producers of VGI and its impact on Geospatial Information	

4. Selection of Themes for Combined Questionnaire

Sustainable Development   (17 Goals)

Analysis activities of the state of the art in each area

Diagnosis of the current situation

Identification of best practices

Consultation among groups and NIA WG

Preparation of technical papers and reports

NIA Aspects (GI)
- ➤ **Technical**
- ➤ **Economical**
- ➤ **Political**
- ➤ **Administrative**

9 LAND THEMES (→ GI/GRI):
- Geographical names
- Administrative units
- Cadastral parcels
- Transport networks
- Hydrography
- Elevation
- Land Cover
- Imagery
- Settlements

Topics (TG →1/2/3):
- **Production System**
- **Funding, Dissemination, Data Policy**
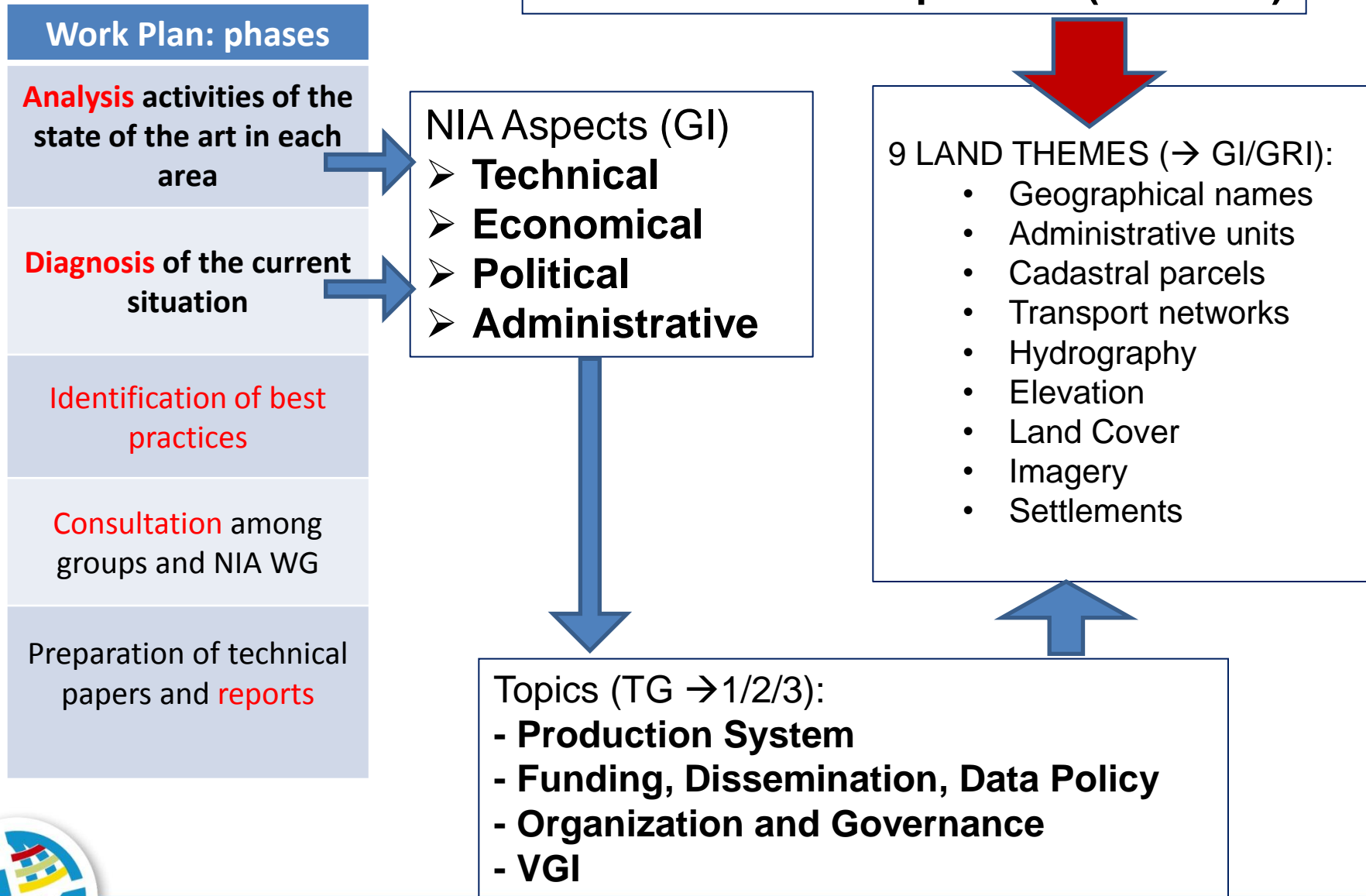- **Organization and Governance**
- **VGI**

UN-GGIM | United Nations Committee of Experts on Global Geospatial Information Management

Positioning geospatial information to address global challenges
ggim.un.org

Which Geospatial Infomation (GI) should we include in the questionnaire?

Basic concepts:

- Geospatial Information is **very extensive**

  → to design a questionnaire is necessary to think about **some geospatial themes** considered more important.

  → today is **possible (and necessary…) to produce by independent themes** with different updating period and technology.

- **Geo-location** is fundamental for:
  - ✓ Reference static and dynamic people, objects and activities
  - ✓ Basic for many commercial business models
  - ✓ Best interface for majority of private and public activities
  - ✓ For BIG DATA is in nature

- In our first approach 2014/2015 only **some LAND Themes** of GI/Geospatial Reference Information(GRI) have been taken into account

Selection of Themes for the questionnaire

UN Sustainable Development Goals

GI Themes

Sustainable Development Goals	Goal 1 — End **poverty** in all its forms everywhere	Goal 2 — End **hunger**, achieve food security and improved nutrition and promote sustainable agriculture	Goal 3 — Ensure **healthy lives** and promote well-being for all at all ages	Goal 4 — Ensure inclusive and equitable quality **education** and promote lifelong learning opportunities for all	Goal 5 — Achieve **gender equality** and empower all women and girls	Goal 6 — Ensure availability and sustainable management of **water** and sanitation for all	Goal 7 — Ensure access to affordable, reliable, sustainable and modern **energy** for all	Goal 8 — Promote sustained, inclusive and sustainable **economic growth**, full and productive **employment** and decent work for all	Goal 9 — Build resilient **infrastructure**, promote inclusive and sustainable **industrialization** and foster innovation	Goal 10 — **Reduce inequality** within and among countries	Goal 11 — Make **cities** and human settlements inclusive, safe, resilient and sustainable	Goal 12 — Ensure **sustainable consumption and production** patterns	Goal 13 — Take urgent action to **combat climate change** and its impacts*	Goal 14 — Conserve and sustainably use the **oceans, seas and marine resources** for sustainable development	Goal 15 — Protect, restore and promote sustainable use of terrestrial **ecosystems**, sustainably manage **forests**, combat desertification, and halt and reverse land degradation and halt	Goal 16 — Promote peaceful and inclusive **societies** for sustainable development, provide access to **justice** for all and build effective, accountable and inclusive **institutions** at all levels	Goal 17 — Strengthen the means of implementation and revitalize the **global partnership for sustainable development**
Geospatial reference information (GRI)	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8	Goal 9	Goal 10	Goal 11	Goal 12	Goal 13	Goal 14	Goal 15	Goal 16	Goal 17
Geographical names	X	X	X			X	X	X	X	X	X	X	X	X		X	
Administrative units	X	X	X	X	X	X	X	X	X	X	X	X				X	X
Transport networks	X	X	X	X			X	X	X	X	X						
Hydrography	X	X	X			X	X						X	X	X		
Elevation	X	X				X	X						X	X	X		
Land Cover	X	X								X		X	X				
Imagery	X	X				X	X				X		X				X
Settlements	X	X	X	X	X	X	X				X		X	X		X	
Geospatial information (GI)																	
Protected sites		X				X							X	X	X		
Statistical units	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Addresses	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X
Cadastral parcels	X	X	X	X	X	X			X	X	X	X				X	
Buildings	X		X	X	X				X		X	X					
Geology													X				
Soil	X	X				X									X		
Land use						X			X	X	X	X	X		X	X	X
Human health and safety	X		X	X		X				X	X					X	X
Utility and governmental services	X		X	X	X		X	X	X	X	X					X	
Environmental monitoring facilities	X	X	X			X			X	X			X		X		
Production and industrial facilities	X		X	X		X	X	X	X	X		X					
Agricultural and aquaculture facilities	X	X				X			X	X		X					
Population distribution and demography	X	X	X	X		X	X	X	X	X	X	X			X	X	X
Area management/restriction/regulation zones & reporting units	X	X	X	X	X			X	X	X	X	X			X	X	X
Natural risk zones	X	X	X						X	X							X
Atmospheric conditions	X	X	X										X				X
Meteorological geographical features	X	X	X			X							X				
Oceanographic geographical features	X					X							X	X			
Sea regions		X				X							X	X			X
Bio-geographical regions	X	X	X										X		X		
Habitats and biotopes	X	X				X						X	X		X		
Species distribution		X	X										X		X		
Energy resources	X						X			X				X			
Mineral resources	X						X			X							

Positioning geospatial information to address global challenges

UN-GGIM | United Nations Committee of Experts on Global Geospatial Information Management

ggim.un.org

Selection of GI Themes for the Combined questionnaire

- The final GI selected themes in this first approach were (GI/**Geospatial Reference Information-GRI**):

  - Geographical names
  - Administrative units
  - Cadastral parcels
  - Transport networks
  - Hydrography
  - Elevation
  - Land Cover
  - Imagery
  - Settlements

MAPS

Other Data Sets
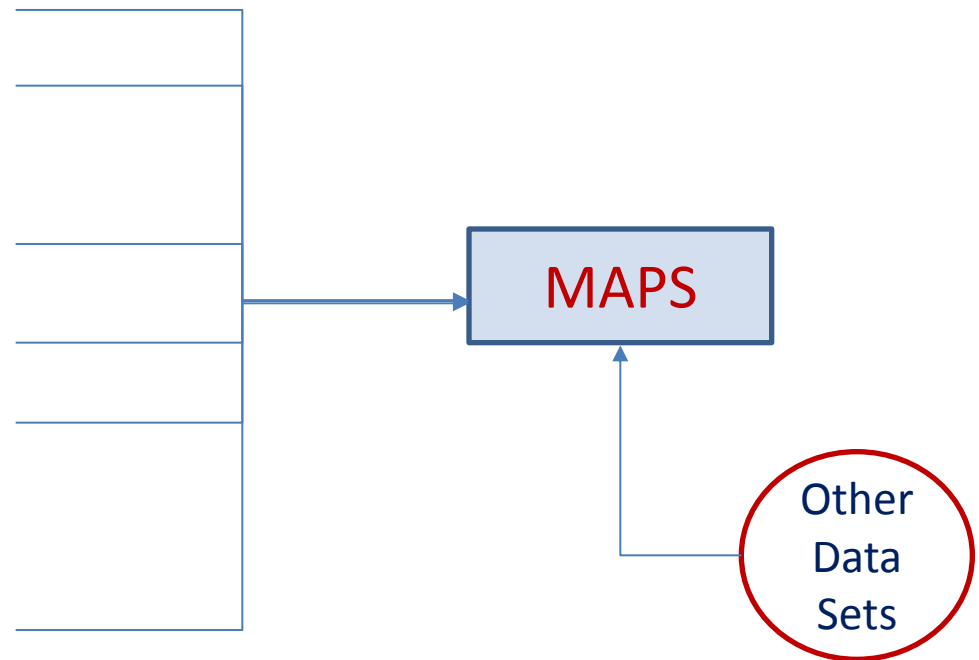
5 . Answered to the Combined Questionnaire
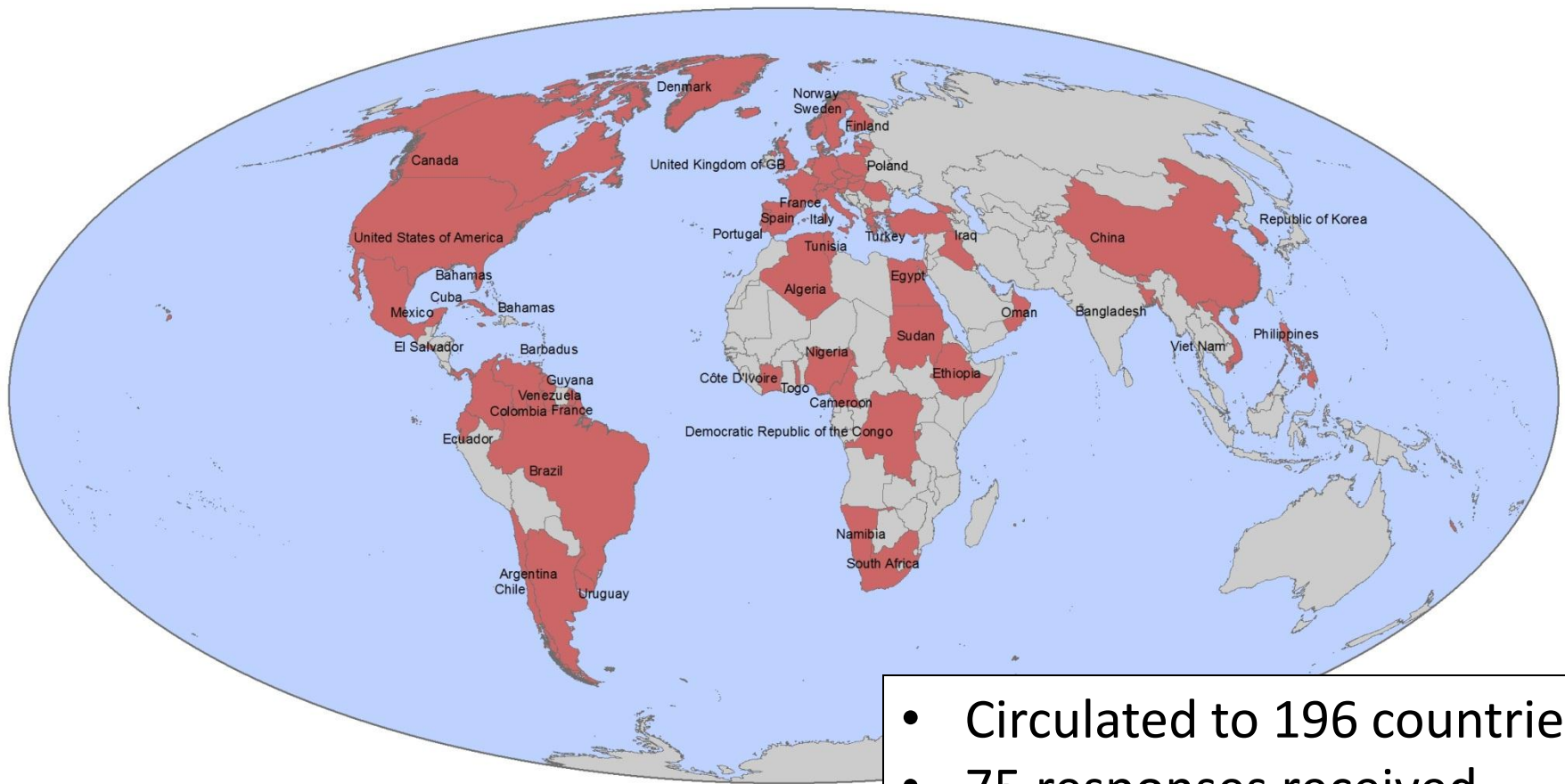
◼ Countries answering the questionnaires

- Circulated to 196 countries
- 75 responses received
- 38% countries

6. Next steps

- **Re-circulate the questionnaire** to be completed by more countries till September 2015

- A **proposal of indicators** will be sent to the NIA WG after the meeting. A ranking of them must be done each NIA WG member by their influence in GI and also the alternative options must be rated. This must be finished before 10/2015 in order to have a further assessment of the different GIM systems

- Discuss and define **the way** to identify of **best practices** of GIM 02/2016

NIA Work Plan/Next steps

→ NIA survey (TG1; TG2;TG3)

+ Status of Topographic Mapping in the World. UNGGIM-ISPRS

ANALYSIS

DIAGNOSIS

SELECTION NIA INDICATORS

ASSESSMENT of GIM Systems

Consultation and agreement concerning indicators

UN-GGIM NIA WG

Segmentation of Countries

IDENTIFICATION of BEST PRACTICES on each segment of Countries

Best Practices
Best Practices
Best Practices
Best Practices
Best Practices

UN Indicators (to be decided)

HDI (Human Development Index)
1 - Health: Life expectancy at birth
2 – Education: Mean years of schooling and Expected years of schooling
3 – Wealth: Gross national income (GNI) per capita

CONSULTATION NIA WG

REPORT

Assessment model example : Indicators selected, weighting factor and score (to be decided by NIA WG consultation and agreement)

			Weighting factor	SCORE				
DATA QUALITY INDICATORS	**Spatial resolution**	Production scale		> 1:1.000	1:1.000-1:5.000	1:5.000-1:25.000	1:25.000-1:50.000	< 1:50.000
	Temporal resolution	Update period		1 - 2 years	3 - 5 years	5 - 10 years	>10 years	
	Thematic resolution	Number of themes produced		>XXX	xxx-xxxx	<xxxx		
	Completeness	From *Status of Topographic Map in the World* (UNGGIM-ISPRS)		>75%	50-75%	25-50%	<25%	
PRODUCTION SYSTEM INDICATORS		Methods applied for data creation/update		Automatic	Semi-automatic	Manual		
		Creation/update of GRI is done by		Own resources	Third parties	Collaborative	VGI	
		Approach used in creation/update of GRI		Bottom-up	Top-down	Independent		
		Update done periodically or continously		Continuously	Periodically			
		Update done for all the territory or only part of it		Complete (all territory)	Partial (part of territory)			
		Update the complete theme or only some features/attributes of it		Complete theme	Some features/attributes			
DISSEMINATION AND DATA POLICY INDICATORS		Existence of structure models for funding		Yes	No			
		Amount allocated (USD) and what		> xxxx	xxx-xxxx	xxxx-xxxx	<xxxxx	
		Percentage regarding the GDP of the country		> xxxx	xxx-xxxx	xxxx-xxxx	<xxxxx	
		Means for access and consulting GRI		Other	Physical media			
		Means used to publish available GI or GRI to the population		Web,elect.magaz., Social net.	TV, Radio, Print advert.			
		Existence of legal framework to regulates the production, dissemination and/or receipt of GI		Yes	No			
		Existence of a law that promotes SDI		Yes	No			
STRUCTURE ORGANIZATIONS INDICATORS		Coordination, participation and collaboration among entities		Strong	Medium	Poor		
		Infrastructure and technological facilitation		Yes	No			
		Use of geospatial information for policy and decision-making		Strong	Medium	Poor		
		Data sharing		Strong	Medium	Poor		
		Open data environment		Yes	No			
		Adoption of data and service standards		Strong	Medium	Poor		
		Existance of a law that promotes SDI		Yes	No			

Assessment model "e.g": TO BE DECIDED BY NIA WG

Category	Indicator	Description	Weighting factor	SCORE				
DATA QUALITY INDICATORS	Spatial resolution	Production scale		> 1:1.000	1:1.000-1:5.000	1:5.000-1:25.000	1:25.000-1:50.000	< 1:50.000
	Temporal resolution	Update period		1 - 2 years	3 - 5 years	5 - 10 years	>10 years	
	Thematic resolution	Number of themes produced		>XXX	xxx-xxxx	<xxxx		
	Completeness	From *Status of Topographic Map in the World* (UNGGIM-ISPRS)		>75%	50-75%	25-50%	<25%	
PRODUCTION SYSTEM INDICATORS		Methods applied for data creation/update		Automatic	Semi-automatic	Manual		
		Creation/update of GRI is done by		Own resources	Third parties	Collaborative	VGI	
		Approach used in creation/update of GRI		Bottom-up	Top-down	Independent		
		Update done periodically or continously		Continuously	Periodically			
		Update done for all the territory or only part of it		Complete (all territory)	Partial (part of territory)			
		Update the complete theme or only some features/attributes of it		Complete theme	Some features/attributes			
DISSEMINATION AND DATA POLICY INDICATORS		Existence of structure models for funding		Yes	No			
		Amount allocated (USD) and what		> xxxx	xxx-xxxx	xxxx-xxxx	<xxxxx	
		Percentage regarding the GDP of the country		> xxxx	xxx-xxxx	xxxx-xxxx	<xxxxx	
		Means for access and consulting GRI		Other	Physical media			
		Means used to publish available GI or GRI to the population		Web,elect.magaz., Social net.	TV, Radio, Print advert.			
		Existence of legal framework to regulates the production, dissemination and/or receipt of GI		Yes	No			
		Existence of a law that promotes SDI		Yes	No			
STRUCTURE ORGANIZATIONS INDICATORS		Coordination, participation and collaboration among entities		Strong	Medium	Poor		
		Infrastructure and technological facilitation		Yes	No			
		Use of geospatial information for policy and decision-making		Strong	Medium	Poor		
		Data sharing		Strong	Medium	Poor		
		Open data environment		Yes	No			
		Adoption of data and service standards		Strong	Medium	Poor		
		Existance of a law that promotes SDI		Yes	No			

Assessment example for a particular country and theme

=0,8*4

Category	Sub	Indicator	Weighting factor	SCORE					Result
DATA QUALITY INDICATORS	Spatial resolution	Production scale	0,8	> 1:1.000 — 5	1:1.000-1:5.000 — **4**	1:5.000-1:25.000 — 3	1:25.000-1:50.000 — 2	< 1:50.000 — 1	3,20
	Temporal resolution	Update period	0,6	1 - 2 years — **5**	3 - 5 years — 3	5 - 10 years — 2	>10 years — 1		3,00
	Thematic resolution	Number of themes produced	0,4	>XXX — 5	xxx-xxxx — **3**	<xxxx — 1			1,20
	Completeness	From *Status of Topographic Map in the World* (UNGGIM-ISPRS)	1	>75% — 5	50-75% — **3**	25-50% — 2	<25% — 1		3,00
PRODUCTION SYSTEM INDICATORS		Methods applied for data creation/update	0,6	Automatic — 5	Semi-automatic — 3	Manual — **1**			0,60
		Creation/update of GRI is done by	1	Own resources — **5**	Third parties — 3	Collaborative — 2	VGI — 1		5,00
		Approach used in creation/update of GRI	1	Bottom-up — 5	Top-down — 3	Independent — **1**			1,00
		Update done periodically or continously	1	Continuously — **5**	Periodically — 1				5,00
		Update done for all the territory or only part of it	0,8	Complete (all territory) — 5	Partial (part of territory) — **1**				0,80
		Update the complete theme or only some features/attributes of it	1	Complete theme — **5**	Some features/attributes — 1				5,00
DISSEMINATION AND DATA POLICY INDICATORS		Existence of structure models for funding	0,6	Yes — 5	No — **1**				0,60
		Amount allocated (USD) and what	0,8	> xxxx — 5	xxx-xxxx — **3**	xxxx-xxxx — 2	<xxxxx — 1		2,40
		Percentage regarding the GDP of the country	1	> xxxx — 5	xxx-xxxx — **3**	xxxx-xxxx — 2	<xxxxx — 1		3,00
		Means for access and consulting GRI	1	Other — 5	Physical media — **1**				1,00
		Means used to publish available GI or GRI to the population	1	Web,elect.magaz., Social net. — **5**	TV, Radio, Print advert. — 1				5,00
		Existence of legal framework to regulates the production, dissemination and/or receipt of GI	0,6	Yes — 5	No — **1**				0,60
		Existence of a law that promotes SDI	0,6	Yes — 5	No — **1**				0,60
STRUCTURE ORGANIZATIONS INDICATORS		Coordination, participation and collaboration among entities	1	Strong — 5	Medium — **3**	Poor — 1			3,00
		Infrastructure and technological facilitation	1	Yes — **5**	No — 1				5,00
		Use of geospatial information for policy and decision-making	0,8	Strong — **5**	Medium — 3	Poor — 1			4,00
		Data sharing	0,8	Strong — 5	Medium — **3**	Poor — 1			2,40
		Open data environment	0,6	Yes — 5	No — **1**				0,60
		Adoption of data and service standards	1	Strong — 5	Medium — 3	Poor — **1**			1,00
		Existance of a law that promotes SDI	1	Yes — 5	No — **1**				1,00

Maximum score ➡ **100**

Total 58,00

UN-GGIM | United Nations Committee of Experts on Global Geospatial Information Management

Positioning geospatial information to address global challenges

ggim.un.org

6. Next steps

➢ *Re-circulate the questionnaires to be completed by more countries*

→ *09/2015*

➢ **Proposal and selection of NIA indicators** → **10/2015**

➢ **Assesment of GIM systems** → **12/2015**

➢ **Discuss and define the way to identify of best practices of GIM** → **02/2016**

➢ **Final Report** → **05/2016**

7. Conclusions

- We have **consolidated** the Group and cooperation system (not easy…)

- We have finalized one important part of the Work Plan, between these three Task Groups (**Questionnaires, Analysis and part of Diagnosis**)

- We have analized in our questionnaires **Themes** and **current situation of production** (not necessary best practices)

- Now it will be possible to carry-out the **identification of existing Best Practices** from the different Countries answers (with indicators)

- We hope to finalize our work next months of **2016**

- Future actions after 2016, could be to review of user requirements (SD) in order **to extend** the 9 Land topics studied:

    o to other **Land themes**

    o to **Marine and Atmosphere** topics

Thank you for your attention

Antonio Arozarena
UNGGIM NIA Chair
Instituto Geográfico Nacional. Spain
aarozarena@fomento.es

UN-GGIM
United Nations Committee of Experts on
Global Geospatial Information Management

Positioning geospatial information to address global challenges

ggim.un.org