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Report of the Permanent Committee on Geographical Information System Infrastructure for Asia and the Pacific

Report Of The Working Group 2: Geospatial Data Management And Services

Submitted by the Permanent Committee on Geographical Information System Infrastructure for Asia and the Pacific (PCGIAP)
Working Group 2: Geospatial Data Management and Services *

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Permanent Committee on GIS Infrastructure for Asia and the Pacific

Status Report of Working Group 2 *for*

19th UNRCC-AP,

Bangkok,

29 Oct. – 1 Nov. 2012

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1. Resolutions adopted at the 18th UNRCC-AP (2009)

The 18th United Nations Regional Cartographic Conference for Asia and the Pacific (UNRCC-AP) and the first new Executive Board meeting of PCGIAP was held in Bangkok in September 2009. Regarding activities of PCGIAP for 2010 to 2012 some resolutions have been approved and three working groups established. The following resolutions are related to WG2 concerning management and services.

Resolutions that have been approved in the Executive Board meeting of Tehran (Iran) are as following:

1) Capacity building in disaster management

The Conference,

Recognizing that institutional strengthening, education and training programs and facilities across the region may not be at the same level of development in all member states,

Recognizing also the ongoing need for training, education and capability development in the region,

Recommends that:

a) The Permanent Committee on Geographical Information System Infrastructure for Asia and the Pacific, United Nations and other partners be requested to support capacity building for the region, in particular for developing countries such as Timor-Leste.

b) The Permanent Committee on Geographical Information System Infrastructure for Asia and the Pacific and other partners facilitate the development of data and services inventory, catalogue, toolkit, guidelines using web services infrastructure.

2) Data Access

The Conference,

Recognizing the benefits of having access to data in time of disaster for assessment and relief, but also the ongoing difficulties of many member states in accessing all forms of spatial data , such as GIS, remote sensing and land administration for disaster management,

Noting the difficulties of transferring large volumes of data via the internet in many countries is problematic,

Further noting the development of web technologies that assist in providing access to data over the internet,

Recommends that efforts be made by countries to improve access to data so as to support

disaster management in a number of ways, including by:

a) Developing and using web technologies, such as geo-portals, to disseminate data,

b) Using appropriate standards for data sharing.

3) Data Integration

The Conference,

Recognizing the importance of integration of fundamental data with other spatial data including hazard and exposure data sets in support of disaster mitigation and reduction,

Also recognizing the power of spatial tools in integrating various data from many sources and multiple formats,

Noting that the discovery, access, integration, and delivery of geospatial data can become much easier with enhanced interoperability,

Further noting the data integration tools developed by PCGIAP,

Recommends that:

a) The Permanent Committee on Geographical Information System Infrastructure for Asia and the Pacific cooperate with the International Steering Committee for Global Mapping (ISCGM), the United Nations Statistics Division (UNSD) and other international organizations in order to integrate spatial and statistical data.

2. Actions Taken since the 18th UNRCC-AP, Thailand 2009

1) In 2010:

In order to perform the resolutions related to WG2, three tables including action items for implementation of capacity building in disaster management, data access and data integration have been developed which have been attached to this report as appendix A.

In the WG2 meeting in Iran, it was approved that Iran, Indonesia and China are the task coordinators of "capacity building in disaster management", "data access" and "data integration", respectively.

Some resolutions have been approved in EB meeting of Tehran (Iran) 2010. These resolutions were related to *capacity building in disaster management, data access and data integrity*. According to recognizing the ongoing need for training, education and capacity development in the region, PCGIAP, United Nations and other partners were requested to support capacity building for the region, in particular for developing countries. Also, by considering data access, it was recommended that efforts should be made by countries to improve access to data in order to support disaster

management. Then by regarding capacity building for disaster management and according to the action items of EB Meeting of PCGIAP in Tehran, it was meant that the project questionnaire would be prepared by Iran and distributed until December 2010. After that, according to the items 1.2 and 1.3 in Table1 in appendix A, Iran prepared two questionnaires under the titles of *Present status of PCGIAP member countries related to using spatial data and access network and web services infrastructure for disaster management* and sent them to the member countries. Then Iran informed the secretariat about this issue to remind the countries to fill the questionnaires. Four emails have been sent by secretariat and despite of the secretariat pursuit, the response rate on those two questionnaires was low.

2) In 2011

According to item 2.2 in table 2 on appendix A of Iran EB-meeting 2010 resolution, emphasis was put in the 16th PCGIAP Meeting 2010 Singapore that Indonesia as one of the vice-chairmen of WG2, was supposed to prepare and distribute a questionnaire in identifying the present status of PCGIAP member countries in terms of accessibility to spatial data and methods of data exchange between governmental organizations by the end of February 2011, and report the analyzed results at the 17th PCGIAP meeting.

According to item 3.2 in table 3 on appendix A of Iran EB-meeting 2010 resolution, emphasis was put in the 16th PCGIAP Meeting 2010 Singapore that China as one of the vice-chairmen of WG2, was supposed to prepare and distribute a questionnaire to survey the fundamental socio-economic demographic geospatial data for better disaster management, and report the analyzed results at the 17th PCGIAP meeting.

3. Resolutions adopted at the 17th PCGIAP Meeting, Mongolia, 2011

1. In order to improve the communications within the Working Group, we should seek the possibility of introducing new technologies including video conferencing,

2. In view of the importance of capacity building on disaster management, we should seek the possibility of organizing a training program on disaster management in consultation with member countries that are advanced in disaster management, including China which is going to organize a training program on disaster management in November 2011,

3. Given the important role played by GSI of Japan for the disaster that took place in Japan on 11 March 2011, request that GSI of Japan continues to share its experience on disaster responses with PCGIAP members, and

4. In order to avoid unnecessary duplication between different questionnaires on SDI, we should study the SDI questionnaire developed by PC-IDEA and make necessary adjustments to the four questionnaires developed by WG2 by the end of September 2011 in time for the preparation for the ad hoc PCGIAP meeting on 27 October 2011 in Malaysia. In addition, make the questionnaires available on the web for the convenience of the member countries.

4. Actions Taken since the 17th PCGIAP Meeting, Mongolia, 2011

1) In 2011

The four questionnaires developed by WG2 have been integrated to the questionnaire. According to the ad hoc PCGIAP meeting on 27 October 2011 in Malaysia, the intersections of GGIM questionnaire and the integrated questionnaire have been detected and omitted (appendix B). The final questionnaire has been sent to the secretariat to distribute them to member countries and send the replies back.

According to items 2.2 and 2.6 in table 2 on appendix A of Iran EB-meeting 2010 resolution a questionnaire has been also designed on SDI status by Chinese vice-chairman of WG2. The purpose of the questionnaire is to acquire sufficient information to assist PCGIAP in evaluating the status of SDI development of PCGIAP members, and also to collect expectation, suggestion and experience in SDI development, so that we will be in a position to find the common interests, single out the best practices, and drive PCGIAP to the right direction. The questionnaire and its analysis have been presented in appendixes C and D.

2) In 2012

After pursuing consecutively, only six countries (Brunei, Bangladesh, Macao, Philippine, Iran and Malaysia) replied. In order to analyze the results, more replies are needed (out of 58 member countries).

5. Tehran Workshop on SDI and disaster management

Iran as the chair of workgroup 2 has the honor of performing a technical workshop related to SDI and disaster management. The workshop on SDI & Disaster Management in Tehran (Sep 2012) would be held pursuant to resolutions in Malaysia and Korea. Schedule of workshop presented as Appendix E.

***Note**: the workshop has been canceled because the number of participants did not reach the minimum limit.*

6. International Conference and Exhibition on Mapping and spatial Information (ICMSI 2012)

The second International Conference and Exhibition on Mapping and spatial Information (ICMSI 2012) and 19th National Geomatics Conference was held on 7-9 May 2012 by National Cartographic Center (NCC) of Iran. More than 460 papers have been submitted to this conference, among them 117 oral papers and 154 poster papers have been accepted. The conference topics were included Geodesy, Hydrography, RS and Photogrammetry, GIS, Cartography and Geo-visualization and Common Themes. The brochure of ICMSI is in the appendix F.

Appendix A

Table1. Activities and steps for WG2 Work Plan (2010-2012) concerning capacity building in disaster management

No.	Obj.	Work plan	Date	Progress
1.1	A	Inviting WG2 member countries to review and approve work plan at WG2 meeting to be held in conjunction with the PCGIAP Executive Board meeting.	EB meeting Iran, 2010	Done
1.2	A1	Identifying the present status of PCGIAP member countries in terms of regional policies and programs, national scientific and technical capacities and accomplished activities related to using spatial data for disaster management (through the questionnaire).	Iran (prep draft) send for comments 1~2 month	The Questionnaire has been prepared and sent by Iran. Not enough results received yet
1.3	A2	Identifying the status of PCGIAP member countries in terms of access networks and web services infrastructure for disaster management at the provincial and national levels (through the questionnaire).	1 month	The Questionnaire has been prepared and sent by Iran. Not enough results received yet
1.4	A	Based on the results of item 1.2 (and, to an extent, item 1.3) the following actions are taken: 1.Outline the type of assistance needed by developing countries and the estimated cost 2. Preparation of training syllabus for the purpose of elevating expertise in different member countries. The syllabus will consist of core subjects and customized sections which are adaptable for certain countries. 3. Reflect quantified needs to UN, PCGIAP and other partners (item 1.2)	2 months for analysis (after receiving 50% reply)	Not enough results received yet

1.5	A	Identifying various types of natural disasters relevant to each country, classify the risks and form required groups from related countries.	Add to questionnaire 1.2 and 1.3	Done
1.6	A	Submitting the report of groups (item 1.5) stating their experiences and the result of research and services concerning disaster management in the context of regional AP SDI.	1 month	After receiving results
1.7	A	Discussing how to share services among member countries, and also define and agree on projects based on a business plan.	In Singapore meeting 2010	Done
1.8	A	Publishing experiments and results, mentioned in item 1.6, on the PCGIAP web site.	1-2 Weeks	After receiving results
1.9	A1	Prioritizing which countries need more assistance for capacity building in disaster management, and determine the financial resources available in each country. Submit report to PCGIAP for subsequent decisions.	During Analysis	After receiving results
1.10	A1	Preparing and submitting progress report concerning capacity building in disaster management for each country.	Add to questionnaire	Done
1.11	A	Publishing results of work plan on the PCGIAP website.	2 Weeks	After receiving results
1.12	A1	Presenting report of WG2 results, concerning capacity building in disaster management, to the PCGIAP EB Meeting in Tehran, Iran.	after Singapore meeting	Done

Table 2. Activities and steps for WG2 work plan (2010-2012) concerning data access

No.	Obj.	Work plan	Date	Progress
2.1	B	Inviting WG2 member countries to review and approve work plan at WG2 meeting to be held in conjunction with the PCGIAP EB Meeting in Tehran, Iran.	EB meeting Iran, 2010	Done
2.2	B	Identifying the present status of PCGIAP member countries in terms of accessibility to spatial data and methods of data exchange between governmental organizations (through the questionnaire).	2 months after 50% parallel with 2.3	The Questionnaire has been prepared by Indonesia and sent. Not enough results received yet
2.3	B	Preparing recommendations for countries which have limitations in giving access to data for regional activities. Submit results to PCGIAP and UN for follow up.		After receiving results

2.4	B1	Developing recommendations and guidelines for countries having weak web technology (based on the results of item 1.3) and submit the document for execution through PCGIAP and UN		After receiving results
2.5	B	Encouraging members of PCGIAP to create national and regional clearinghouses, develop standards and protocols for data access at the national level, and design geo-portals for access and retrieval of required spatial data for the purpose of spatial analysis and decision making during disasters.		Done
2.6	B2	Promoting the ISO 19115 standard for metadata, and determine the required metadata profile based on the study of existing metadata standards in member countries.	6 months parallel to 2.5	Done
2.7	B	Developing minimum specifications and instructions for member countries to enter clearinghouse and data access activities (including technical and managerial issues), in coordination with national and regional SDI objectives.	6 months after 2.6	Not done
2.8	B	Preparing and submitting progress report concerning facilitation of data access for all countries.	2 months after 2.7	After receiving results
2.9	B	Publishing results of work plan on the PCGIAP website	1 month	After receiving results
2.10	B	Presenting report of WG2 results concerning data accessibility to the PCGIAP EB Meeting in Tehran, Iran.	In Mongolia meeting	Done

Table 3. Activities and steps for WG2 Work Plan (2010-2012) concerning data integration

No.	Obj.	Work plan	Date	Progress
3.1	C1	Inviting WG2 member countries to review and approve work plan at WG2 meeting to be held in conjunction with the PCGIAP EB Meeting in Tehran, Iran.	EB meeting Iran, 2010	Done
3.2	C1	Identifying basic statistics and spatial data of interest to PCGIAP, UN and administrative organizations of member countries (through the questionnaire).		The Questionnaire has been prepared by China and sent. Not enough results received yet
3.3	C1	Encouraging countries to implement disaster management databases based on Geodatabase technology, using unified specifications and format, and fundamental and hazard spatial data from related organizations		Done

3.4	C1	Define, design and implement an AP disaster management spatial database through integration of national spatial databases of member countries and existing data in other organizations, such as, ISCGM and UNSD under PCGIAP supervision. Development of integration tools will be done by PCGIAP.		Not done
3.5	C1	Prepare and submit progress report concerning data integration in disaster management for each country		After receiving results
3.6	C1	Publish results of work plan on the PCGIAP website		After receiving results
3.7	C1	Present report of WG2 results concerning data integration to the PCGIAP EB Meeting in Tehran, Iran.		Done

Appendix B

Working Group 2

PCGIAP Executive Board Meeting

Questionnaire

Present status of PCGIAP member countries related to using spatial data for disaster management

Based on the Work Plan (2010 - 2012)
(Approved in executive board meeting
Tehran- Iran 16, 17 May 2010)

Introduction

Hazard is a potentially damaging physical event, phenomenon or human activity that may cause loss of life or injury, property damage, social and economic disruption, or

environmental degradation. Hazards can include latent conditions that may represent future threats and can have different origins: natural (geological, hydro-meteorological and biological) or induced by human processes (environmental degradation and technological hazards).(UN/ISDR. Geneva 2004).

Disaster is a result from the combination of hazard, vulnerability and insufficient capacity or measures to reduce the potential chances of risk. Disaster management includes sum total of all activities, programs and measures which can be taken up before, during and after a disaster with the purpose to avoid a disaster, reduce its impact or recover from its losses. In every stage of disaster management, information is indispensible. A better disaster management needs sufficient information and its full accessibility.

Based on the resolutions of 18th PCGIAP Conference in Bangkok (Thailand), Working Group II was intended to act on three items including Capacity Building in Disaster Management, Data Access and Data Integration. These items were the objectives of WG2 Work Plan (2010-2012). Then according to two items (items 1.2 and 1.3) of this work plan, The questionnaire 1 and questionnaire 2 in relation to present status of PCGIAP member countries concerning using spatial data and access network and web services infrastructure respectively for disaster managements, were provided by Iran and in 16th PCGIAP meeting (Singapore), these questionnaires were presented and gave to secretariat to be issued among PCGIAP member countries to fill them out and send back to the secretariat.

Furthermore, according to the resolutions for PCGIAP working group in Singapore, Indonesia as a member of WG2, prepared a questionnaire in identifying the present status of PCGIAP member countries in terms of *accessibility to spatial data and methods of data exchange between governmental organizations*. Also, China as a member of WG2, prepared a questionnaire to survey *the fundamental socio-economic demographic geospatial data for better disaster management*.

Next, the three questionnaires from three above mentioned countries were summarized and were given as follows. According to the concepts of disaster management, this questionnaire aims to identify potential of data resources for disaster management in the region of Asia and the Pacific by surveying fundamental, socio-economic, demographic and geospatial data available in member countries of PCGIAP. Based on the result, the necessity and feasibility of data sharing between PCGIAP member countries, for the purpose of disaster management will be found.
This questionnaire is expected to be filled in by member countries and be submitted by e-mail to the PCGIAP Working Group II for further procedures.

Information about Preparer of This Questionnaire (*: mandatory)

Name*		Job Title*	
Email*		Date*	

PCGIAP member country*	
Organization name*	

1- Data accessibility and sharing[1]

1-1-What fundamental datasets are accessible and sharable amongst governmental agencies and user community? Please indicate both fundamental dataset and corresponding governmental agencies.

DATASET ***AGENCIES***

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____
g. _____
h. _____
i. _____

1-2- Is there any coordinator body that takes care of the fundamental datasets sharing and access? If the answer is "YES" mention name.

_____
_____
_____
_____

1-3-To serve access and sharing the fundamental datasets, are some tools such as clearinghouse or geoportal developed in your country If the answer is "YES" what is the URL address?

_____
_____

1-4-What are the main contents or services provided by the clearinghouse or geoportal (such as search, online maps, download, participative mapping, etc.

_____
_____

[1] - provided by Indonesia

_____
_____
_____
_____

1-5-What data providers or data custodians are connected to the clearinghouse or geoportal? Do they share their datasets?

	DATA PROVIDERS/CUSTODIANS	***SHARE DATA***
a.	_____	*Y/N*
b.	_____	*Y/N*
c.	_____	*Y/N*
d.	_____	*Y/N*
e.	_____	*Y/N*
f.	_____	*Y/N*
g.	_____	*Y/N*
h.	_____	*Y/N*

And how they are connected? (Internet, Virtual Private Network, others)

1-6-What agency/organization takes the responsibility of clearinghouse or geoportal?

_____
_____
_____

1-7-Who are users of clearinghouse or geoportal and how often they access the clearinghouse or geoportal?

_____
_____
_____
_____
_____
_____
_____

2- Questionnaire on Data Resource[2]

Note: for the column "Key Contents", please give some key words for the specific data resource.

2-1- Background Data

[2] - provided by China

Data resource	Existence/Continuity	Key Contents	Freshness/Update Cycle	Scale/resolution	Accessibility
Terrain	☐ not exist ☐ 1 Edition ☐ 1-3 Editions ☐ 3-5 Editions ☐ 5-10 Editions ☐ > 20 Edition		☐ <=1year ☐ 1-2 years ☐ 2-5 years ☐ >5 years ☐ No Update	☐ National ☐ Regional ☐ Local ☐ Other	☐ Public ☐ Classified ☐ Private/Commercial ☐ Limited Communities
Water Bodies	☐ Not Exist ☐ 1 Edition ☐ 1-3 Editions ☐ 3-5 Editions ☐ 5-10 Editions ☐ >10 Editions		☐ <=1 year ☐ 1-2 years ☐ 2-5 years ☐ > years ☐ No Update	☐ National ☐ Regional ☐ Local ☐ Other	☐ Public ☐ Classified ☐ Private/Commercial ☐ Limited Communities
Transportation	☐ Not Exist ☐ 1 Edition ☐ 1-3 Edition ☐ 3-5 Editions ☐ 5-10 Editions ☐ >10 Editions		☐ <=1 year ☐ 1-2 years ☐ 2-5 years ☐ >5 years ☐ No Update	☐ National ☐ Regional ☐ Local ☐ Other	☐ Public ☐ Classified ☐ Private/Commercial ☐ Limited Communities
Land use/cover	☐ Not Exist ☐ 1 Edition ☐ 1-3 Editions ☐ 3-5 Editions ☐ 5-10 Editions ☐ >10 Editions		☐ <=1 year ☐ 1-2 years ☐ 2-5 years ☐ >5 years ☐ No Update	☐ National ☐ Regional ☐ Local ☐ Other	☐ Public ☐ Classified ☐ Private/Commercial ☐ Limited Communities
Manmade construction	☐ Not Exist ☐ 1 Edition ☐ 1-3 Editions ☐ 3-5 Editions ☐ 5-10 Editions ☐ >10 Editions		☐ <=1 year ☐ 1-2 years ☐ 2-5 years ☐ >5 years ☐ No Update	☐ National ☐ Regional ☐ Local ☐ Other	☐ Public ☐ Classified ☐ Private/Commercial ☐ Limited Communities

2-2-Socio-economicData

Data resource	Existence/Continuity	Key Contents	Freshness/Update Cycle	Scale/resolution	Accessibility
Natural resources	☐ Not Exist ☐ 1 Edition ☐ 1-3 Editions ☐ 3-5 Editions ☐ 5-10 Editions ☐ >10 Editions		☐ <=1 year ☐ 1-2 years ☐ 2-5 years ☐ >5 years ☐ No Update	☐ National ☐ Regional ☐ Local ☐ Other	☐ Public ☐ Classified ☐ Private/Commercial ☐ Limited Communities
Population	☐ Not Exist ☐ 1 Edition ☐ 1-3 Editions ☐ 3-5 Editions ☐ 5-10 Editions ☐ >10 Editions		☐ <=1 year ☐ 1-2 years ☐ 2-5 years ☐ >5 years ☐ No Update	☐ National ☐ Regional ☐ Local ☐ Other	☐ Public ☐ Classified ☐ Private/Commercial ☐ Limited Communities
Cadastre	☐ Not Exist ☐ 1 Edition ☐ 1-3 Editions ☐ 3-5 Editions ☐ 5-10 Editions ☐ >10 Editions		☐ <=1 year ☐ 1-2 years ☐ 2-5 years ☐ >5 years ☐ No Update	☐ National ☐ Regional ☐ Local ☐ Other	☐ Public ☐ Classified ☐ Private/Commercial ☐ Limited Communities
Economy	☐ Not Exist ☐ 1 Edition ☐ 1-3 Editions ☐ 3-5 Editions ☐ 5-10 Editions ☐ >10 Editions		☐ <=1 year ☐ 1-2 years ☐ 2-5 years ☐ >5 years ☐ No Update	☐ National ☐ Regional ☐ Local ☐ Other	☐ Public ☐ Classified ☐ Private/Commercial ☐ Limited Communities

Data resource	Existence/Continuity	Key Contents	Freshness/Update Cycle	Scale/resolution	Accessibility
Hazard sources	☐ Not Exist ☐ 1 Edition ☐ 1-3 Editions ☐ 3-5 Editions ☐ 5-10 Editions ☐ >10 Editions		☐ <=1 year ☐ 1-2 years ☐ 2-5 years ☐ >5 years ☐ No Update	☐ National ☐ Regional ☐ Local ☐ Other	☐ Public ☐ Classified ☐ Private/Commercial ☐ Limited Communities
Utilities for disaster preparing	☐ Not Exist ☐ 1 Edition ☐ 1-3 Editions ☐ 3-5 Editions ☐ 5-10 Editions ☐ >10 Editions		☐ <=1 year ☐ 1-2 years ☐ 2-5 years ☐ >5 years ☐ No Update	☐ National ☐ Regional ☐ Local ☐ Other	☐ Public ☐ Classified ☐ Private/Commercial ☐ Limited Communities
Disaster risk	☐ Not Exist ☐ 1 Edition ☐ 1-3 Editions ☐ 3-5 Editions ☐ 5-10 Editions ☐ >10 Editions		☐ <=1 year ☐ 1-2 years ☐ 2-5 years ☐ >5 years ☐ No Update	☐ National ☐ Regional ☐ Local ☐ Other	☐ Public ☐ Classified ☐ Private/Commercial ☐ Limited Communities

3- Spatial data for disaster management[3]

3-1-Situation of natural hazards and disasters management

[3] - provided by Iran

3-1-1- Check the boxes in Table 1 to clarify types of natural disasters relevant to your country.

Country Name	Earthquakes	Landslide	Floods	Drought	Avalanche	Tsunami	Volcanic Eruption	Hurricanes/Monsoon	Cyclones/Typhoons	Wildfire	Agricultural Pests	Sandstorm	Epidemics	Other
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

3-1-2-Are there any recorded documents available for each disaster If the answer is "YES" mention in more detail

_____

_____

3-1-3-What is the administrative structure for disaster management in your country? (Provide explanation or diagram)

_____

_____

_____

_____

3-1-4 whether any <u>Risk and Vulnerability Assessment</u> has been done and verified? (If yes, indicate for which disasters and which regions.)

_____

_____

_____

___

3-1-5-How much budget is annually approved to the national disaster management in your country? (Roughly)

_____

_____

_____

___

3-1-6-Has your country ever contributed to other country/countries to manage any disaster(s)? If yes, to which country in which disasters and how?

_____
_____
_____
_____

3-1-7-Have any spatial data been shared in relation to question 3-1-6? Which data?

_____
_____
_____
_____

3-1-8-Is your country interested in contributing regional disaster management? If yes, what kinds of data, in which scale and format?

No	Disaster	Data[4]	Digital Data Format[5]	Digital Data Scale[6]	Risk Rate[7]	Organization[8]
1	Earthquakes					
2	Landslide					
3	Floods					
4	Drought					
5	Avalanche					
6	Tsunami					
7	Volcanic Eruption					
8	Hurricanes/Monsoon					
9	Cyclones/Typhoons					
10	Sandstorm					

4 - "Data" column indicates available data for each disaster. (Digital / hardcopy – Fundamental / Technical)

5 - "Digital Data Format" column indicates kind of digital data available for each disaster. (Geodatabase , Shape file , Cad Maps, etc)

6 - "Digital Data Scale" column indicates scale(s) of digital data available for each disaster. (1:500,1:1000,1:2000,1:5000, etc)

7 - "Risk Rate" column indicates the risk for each disaster in your country (low - medium - high)

8 - "Organization" column mentions organizations keep records for each disaster

11	Wildfire					
12	Agriculture Pests					
13	Epidemics					
14	Other					

3-2- Training and Personnel in Natural hazards and disasters management-

3-2-1-Which syllabus has been trained in relation to disaster management?

_____
_____
_____
_____

3-2-2-What is your organizations' education requirement about disaster management?

_____
_____
_____
_____

3-2-3-Is your country ready to hold training courses relevant to disaster management for PCGIAP member countries? If yes, which courses?

No	Disasters Management Phases	Org/Com/ NGO[9]	Training Center[10]	Administrative Boundary[11]
1	Mitigation			
2	Preparedness			
3	Response			
4	Reconstruction			

9 - "Org/Com/NGO" column explains how many organizations, companies, NGOs… are involved to manage disasters in each phases

10 - "Training Center" column mentions if there is any training center to train Managers, volunteers… in each region /province/city/district

11 - "Administrative Boundary" columns explain what administrative level are the training centers located in (region /province/city/district, …)

4- Access network and web services for disaster management

4-1- GIS Database or Map Servers

4-1-1- Is there any GIS Database or Map Servers in your country?

- ☐ Yes
- ☐ No

(If the answer to the above question is "NO", skip the rest of the questions in section 4-1)

4-1-2-What is the extent of GIS Database or Map Servers of your country? (More than one option may be possible)

- ☐ Organizationa
- ☐ Urban
- ☐ Provincial
- ☐ National

☐ Others (explain the extent)

4-1-3-How GIS Database or Map Servers is connected to the Internet? (Type of connection)

- ☐ Independent Satellite Connection
- ☐ National Communication Type
- ☐ Others (Explain the Connection Type)

4-1-4-Regarding the above answer, what is the bandwidth of cable communication? (If there is any cable communication)

- ☐ Less than 2 Mbit
- ☐ More Than 2 and Less Than 6 Mbit
- ☐ More Than 6 and Less Than 10 Mbit
- ☐ More Than 10 Mbit

4-1-5-What is the bandwidth of wireless communication in question 4-1-3? (If there is any wireless communication)

- ☐ Less Than 0.5 MHz
- ☐ 1 MHz
- ☐ 2 MHz
- ☐ More Than 2 MHz
- ☐ Others (Explain)

4-1-6- Is there any redundant communication other than master communication?

- ☐ Yes
- ☐ No

4-1-7-Is there any backup or mirror web site(s) other than master web site?

- ☐ Yes
- ☐ No

4-1-8-If the answer to question 4-1-7 is "YES" how are the backup web site(s) connected to the master web sites?

- ☐ Independent Satellite Communication
- ☐ National Communication Infrastructure with Band Width More Than 2 Mbit
- ☐ National Communication Infrastructure with Band Width Equal or Less Than 2 Mbit

4-1-9-Which technology is used to design web sites?

- ☐ PHP
- ☐ Dot Net
- ☐ Others (Explain)

4-1-10- What database software manager has been utilized in web sites?

☐ MySQL

☐ SQL

☐ Oracle

☐ Others (Explain)

4-1-11-How can most users be connected to web sites?

☐ Dial Up

☐ PSTN (ISDN, DSL, etc.)

☐ Independent Wireless

☐ Others (Explain the Connection Type)

4-1-12-Whether users have permission to modify data of the web sites?

☐ No, They Are Just Viewers

☐ Yes, According to Their Privilege, They Have Permission to Update the Contents

4-1-13-How many web site users do you have? (Skip the question if you have no accurate statistics)

☐ Less Than 1000

☐ More Than 1000 and Less Than 10000

☐ More Than 10000 and Less Than 100000

☐ More Than 100000

4-1-14-Who are the main users of web sites?

☐ Govermental Users

☐ Private Users

☐ Others (Explain)

4-2 –Clearinghouse

4-2-1- Is there any clearinghouse?

☐ Yes

☐ No

(If the answer to the above question is "NO", skip the rest of the questions in section 4-2)

4-2-2-What is the extent of clearinghouse? (More than one option may be possible)

☐ Organizational

☐ Urban

☐ Provincial

☐ National

☐ Others (Explain the Extent)

4-2-3-How the clearinghouse is connected to the Internet? (Type of connection)

☐ Independent Satellite Connection

☐ National Communication Infrastructure

☐ Others (Explain the Connection Type)

Regarding the above answer what is the bandwidth of communication?

☐ Less Than 2 Mbit

☐ More Than 2 and Less Than 6 Mbit

☐ More Than 6 and Less Than 10 Mbit

☐ More Than 10 Mbit

4-2-4-What database software manager has been utilized in web sites?

☐ MySQL

☐ SQL

☐ Oracle

☐ Others (Explain)

4-2-5-How can most users be connected to web sites?

☐ Dial Up

☐ PSTN (ISDN, DSL, etc.)

☐ Independent Wireless

☐ Others (Explain)

4-2-6-Do users have permission to modify metadata in the clearinghouse?

☐ No, They Are Just Viewers

☐ Yes, According to Their Privilege, They Have Permission to Update Contents

Appendix C

Questionnaire on Status of SDI in PCGIAP Members

Foreword

Background

Since the establishment of the Permanent Committee on GIS Infrastructure for Asia and the Pacific (PCGIAP) in 1995, the situation has changed a lot. There are growing number of global issues including many cross-border problems like climate change and natural disasters. More and more people are getting familiar with geospatial information. At the same time, to address and rapidly respond to key global challenges, we are still facing big challenges. With this background, the UN started the programme on Global Geospatial Information Management (GGIM). The coming first high level forum on GGIM in October this year, co-organized by NGII Korea and the UN-DESA, supported by PCGIAP, will promote SDIs development to a new stage.

As an important international inter-government organization for the Asia-Pacific region, PCGIAP need make steps to adopt to the changes and challenges, so a better knowledge of the current situation, best practices, emerging needs and urgent problems in SDI development and application in members is necessary.

Purpose

The purpose of this questionnaire is to acquire sufficient information to assist PCGIAP in evaluating the status of SDI development of PCGIAP members, and to collect expectation, suggestion and experience in SDI development, so that we will be in a position to find the common interests, single out the best practices, and drive PCGIAP to the right direction. In addition, PCGIAP can deliver a useful and fresh report at the coming GGIM forum to share the collective thoughts.

Instructions

There are 9 aspects of questions listed in tables in the 2nd part, all italic words are notes. All PCGIAP members are encouraged to answer these questions, and for EB members it is required.

What need to be emphasized is that this questionnaire has a national character, that is, the expected result is only one integrated questionnaire by country.

Please be certain that all questions are answered completely. If additional space is needed, attach extra pages. If

you require assistance on any section of this questionnaire, please contact ZHOU Xu at zhouxu@nsdi.gov.cn.

The deadline for its completion is September 25, 2011. Please kindly submit your answer to secretariat of PCGIAP (ngii21@korea.kr) before the deadline.

Questionnaire

Identification of the institution entitled to administer this questionnaire

Information about Preparer of This Questionnaire (: mandatory)*

Information about person who prepares this questionnaire form:			
Name*		Job Title*	
Official Email*		Date*	
Information about the institution:			
PCGIAP member name*			
Organization name*			

Institution

Q1: What is the structure of the geo-spatial information administration?

Please introduce the administration system of geo-spatial information management in your country, including the national and local administrative hierarchy, responsibility and the role of your organization.
Answer:

Legislation

Q1: What is the composition of legislation system on geo-spatial information?

Please introduce legislation system related to geo-spatial information application and management, including but not limit to high level laws and administrative regulations, especial those involving geo-spatial information sharing, for example, the policy of access limitation and price.
Answer:

Specifically, please answer following related questions (Q2-Q5) by check Yes or No:

Q2: In view of detailed geospatial information made available by the global geospatial industry on the internet, is there a need of common regional/global regulatory framework for the geospatial information that can be shared on the internet?

☐ YES ☐NO

Q3: In light of growing use and dissemination of high resolution satellite images and street view images available on the internet, does your country have any regulations to restrict the distribution of such images?

☐ YES ☐NO

Q4: Does your organization charge the users for the digital data your organization distributes?

☐ YES ☐NO

Q5: Is there any restriction or regulation on the secondary use of digital data that is prepared by your organization?

☐ YES ☐NO.

Q6: Are there any regulations in your country that allow your mapping organization to participate in international initiatives in developing regional/global spatial data infrastructure?

☐ YES ☐NO

Strategy and program

Q1: Is there a strategy on SDI in your country?	☐ YES ☐NO
If yes, please give the title and main contents of the strategy as following:	
Title of the strategy:	

Main Contents of the strategy:

Q2: What kinds of programs are initiated in recent years?
Please give an introduction on the strategies on SDI or the like of your country, then list and describe major programs finished or running in 5-10 years. For the programs you introduce, please highlight the purpose and the effects (including the positive and negative). **Answer:**

Information resources

Q1: What geo-spatial information resources are in your country?
Please describe the key geo-spatial datasets and related capacity, including product categories, feature types, scales/resolution, volume, coverage and extent of available datasets. In addition, please give some examples to show the application of these resources.

Title of dataset	feature type	scales/resolution	volume	geographic extent	update cycle

Applications of these datasets:

Specifically, please answer following related questions (Q2-Q4) by check options:

Q2: Is the geodetic datum adopted in your country geocentric or locally established?

☐ YES ☐NO

Q3: If your country's geodetic datum is locally established, does your country have a plan to introduce a geocentric datum?

☐ YES ☐NO

Q4: What would be the most suitable minimum map scale/resolution for the base geospatial database of the region?

☐1:1M, ☐1:500k, ☐1:250k, ☐1:100k, or ☐1:50k

Standards and Software Platform

Q1: What is the situation of geo-spatial standardization?

Please give a general description of the state of geo-spatial standardization in your country, including the amount of functional standards, the state of international standard adoption, and activities of standardization, especially international activities participated.
Answer:

Please answer following specific questions (Q2-Q5) related to Q1 by check or choose the proper option:

Q2: Does your organization provide or distribute geospatial information in digital form?
☐ YES ☐NO

Q3: If yes in Q2, what are the standards or formats used in such data provision or distribution in digital form?

A. Standards based on ISO/TC211;
B. Data format used in a commercial GIS software (such as SHAPE);
C. A specially developed format by your country tailored for a specific data set;
D. Other standards/formats.

Q4: Does you country have a regulation or guideline that requires government offices to prepare a metadata for each type of geospatial information developed by the offices?
☐YES ☐NO

Q5: If yes in Q4, what are the metadata standards used in the regulation or guideline?

A. Standards based on ISO/TC211; or
B. Other standards/formats.

Q6: What are the popular geo-spatial soft-wares used in your country?

Please give an estimation of market occupation for popular software platforms in your country.

Name of software	**market occupation**	**Field of use**

Public geo-information online service

Q1: What kind of popular online geo-information services are publicly available in your country?

Please list and introduce the popular online geo-information services people access in your country, including the name, provider, URL and service content, please give some remarks about the services you list as well.

Service Name	provider	URL	service content

Remarks about the service	

Service Name	provider	URL	service content
Remarks about the service			

Service Name	provider	URL	service content
Remarks about the service			

Service Name	provider	URL	service content
Remarks about the service			

Service Name	provider	URL	service content
Remarks about the service			

Service Name	provider	URL	service content
Remarks about the service			

Coordination mechanism on SDI

Q1: Is there a cross-department coordination mechanism on SDI in your country? ☐ YES ☐NO

Please give a detailed description if yes, and say some words about the reason if no.

Answer:

Industry

Q1: What about the geo-spatial information industry in your country?

Please give an introduction about the geo-spatial information industry by some numbers, for example the number of companies, the annual revenue or annual output of the industry.

Answer:

Suggestion about regional cooperation between in PCGIAP members

Q1: Do you think having a regional/global framework similar to INSPIRE in Europe that impose a mandate to each national mapping organization to work more closely for the region/world?
☐ YES ☐NO

Q2: How to promote the regional cooperation between in PCGIAP members from your point of view?

Please specify your needs for regional cooperation, and list the interest points you concern. Based on your needs or interests, please give some suggestions on how to promote such kind of cooperation and explain what you expect from PCGIAP.

Answer:

Appendix D

Summary of Questionnaire on Status of SDI in PCGIAP Members

Foreword

To acquire sufficient information to assist PCGIAP in evaluating the status of SDI development of PCGIAP members, and to collect expectation, suggestion and experience in SDI development, in the September this year, a questionnaire was issued to PCGIAP members with 9 aspects of questions regarding the status of SDI (Appendix C[12]).

Within one month, 18 of 56 (32%) PCGIAP members answered the .questionnaire, including 10 EB member

and 8 non-EB members (Appendix D[13]). There is not response from 1 PCGIAP EB members - India as required in the questionnaire. These 18 members cover about the 59.8% population and 44% land area of the whole region (Fig 1).

Fig 1 coverage of responding members

Summary of the results

Institution

According to the questionnaire results, 13 member countries have a national and local hierarchical administration system of geo-spatial information management. Generally, the national mapping agencies (NMA) are of the responsible authorities. Most of the agencies are under a ministry level in their government system, that is, most NMAs play an assistant role in the national decision making system.

Responsibility of NMAs varies. Most NMAs are only responsible for the basic geospatial information (framework data or topographic data), in addition, some NMAs are also responsible for cadastral and/or land information (Korea, Singapore, Malaysia, Brunei Darussalam etc.). Especially, Geoscience Australia is the only NMA who is responsible for a wide-ranged geospatial data, including topographic, geological, geodetic, bathymetric and geo-scientific data. So, theoretically Australia has more comparative advantages in sharing and making integrative use of geo-spatial information.

Legislation

From the questionnaire results, for legislation which is linked indirectly to geospatial information application, management or sharing, only Indonesia, Japan, Korea have the specific acts.

Indonesia: On 21st April 2011, Indonesia issued the geospatial information law. The law forms a legal platform for the management and uses of geospatial information in Indonesia. To fully implement the law, several regulations, policies, procedures derived from the law need to be developed. These regulations are now in development stages.

Japan: "Basic Act for the Advancement of Utilizing Geospatial Information (hereinafter, “AUGI”)" designed to advance utilization of geospatial information in May 2007, in which basic principles and clarifying the responsibilities of central and local governments as well as specifying basic elements for measures on AUGI are mentioned.

Korea: (1)"National Spatial Data Infrastructure Act": the regulations of the effective national spatial data system setup and its general use; (2) "Spatial Data Industry Promotion Act": to provide the development of national economy and improving the quality of people’s lives by consolidating the competitiveness of spatial data industry and striving for its promotion.

The status of legislation related to geospatial information application, management or sharing indicates the degree of the society's common view. So these three countries, currently especially Korea and Japan have comparatively better environment to promote SDI developing and application.

Strategy on SDI

Strategy on SDI represents understanding the importance of SDI, and also is an indicator refers how much importance is attached to SDI. An sustainable and operable strategy is the prerequisite to promote better

[13] Appendix D Responses of the Questionnaire

geospatial data sharing and application.

There are 14 of 19 members have their national strategy in operation on NSDI, and have operated many projects to implement these strategies with many fruitful results. The rest 4(Bangladesh, Mongolia, Nepal and Vietnam) just are just planning to develop such a strategy.

As to the programs related to SDI initiated in recent years, all members are engaged in data capturing, in addition, 14 members have started SDI related projects and get results running now, including 10 catalog systems. There are 4 or 5 members are still considering to do that. The details are as following table 1:

Table 1 programs related to SDI

No.	Country/Region	Projects	Catalog/Clearinghouse	Status/Schedule
1	Australia	ASDI	ASDD	Finished
2	Bangladesh			
3	Brunei	SSDI	Geo-Portal	2012
4	China	Digital China Geo-spatial Framework	Geo-information public service platform	Finished
5	Hongkong,China		GIS metadata catalogue	Finished
6	Indonesia	Ina-SDI	National Geospatial Portal	On going
7	Iran	national Geo-portal		On going
8	Japan	FGD, Digital Japan	Geographic Information Clearinghouse	Finished
9	Korea	Master Plan of National Spatial Data Policy	National Spatial Data Distribution Center	finished
10	Laos			
11	Macao, China	Geospatial Information Sharing Infrastructure		In planning
12	Malaysia	MyGDI	Geospatial Data Center	Finished and Continue
13	Mongolia			
14	New Zealand	Many	Geodata.govt	Finished
15	Nepal	NGIIP		Initiated in 2002
16	Philippines	PGP		On going
17	Singapore	Singapore Geospatial Collaboration Environment	Geo-Space portal	Finished
18	Sri Lanka			
19	Vietnam			

Information Resources

Based on the role of NMAs, most information resources available are of framework data, including topographic, addressing, cadastral, geodetic, coastlines, water body, administrative boundaries, transportation and utilities, building and public facilities, land cover, remote sensing image, etc. In addition, some members have geological, environmental and census data.

Standards and Software Platform

There are 5 P members and 1 observer member of ISO/TC 211 among the 19 PCGIAP members. Most of the members (12 of 19) have made big progress in geo-information standardization, international standards adoption is a common choice for these members. But there still are 5 members who are in the beginning stage of geo-information standardization.

According to the questionnaire results, ARCGIS is the most popular software used in GIS applications.

Public Geo-information Online Service

For public geo-information online services, 12 members listed totally 42 individual online services, and the rest 7 remain empty, but obviously some commercial geo-information online services, for example Google map and Microsoft virtual earth, are available for them. Among the listed services, most of them are provided by NMAs, and the details are as following table 2:

Table 2 online services

No.	Country/Region	Total	Map/Data Service	Catalog Service	Information
1	Australia	6	4		2
2	Bangladesh	null			
3	Brunei	1	1		
4	China	5	4	1	
5	Hongkong,China	1		1	
6	Indonesia	5	3	1	1
7	Iran	null			
8	Japan	6	5	1	
9	Korea	3	3		
10	Laos	null			
11	Macao, China	3	3		
12	Malaysia	2	2	1	
13	Mongolia	null			
14	Nepal	2		1	1
15	New Zealand	6	4	1	1
16	Philippines	null			
17	Singapore	2	2		
18	Sri Lanka	null			
19	Vietnam	null			
Sum		42	31	7	5

Coordination mechanism on SDI

Among the 14 responses, there exists national level coordination mechanism on SDI in 9 members, the rest 5 have not at the present.

Industry

As of the result, only 7 countries answered the specific question. According to the responses, the output of geo-spatial industry is far more than 77.8 billion[14] USD every year in this region, and there are totally more than 25000 businesses in the responding countries. The details are as following table 3:

Table 3 output of geo-spatial industry

No.	Country/Region	Output	Output in USD	Business
1	Australia	12B	12B	null
2	China	10.7B	10.7B	11657
3	Indonesia	60M	60M	70
4	Japan	4T	52B	12641
5	Korea	2903B	2.9B	644

[14] This number could reflect a approximate scale of the geospatial industry, but not a accurate statistics result.

6	Mongolia	null	null	100
7	New Zealand	100M	100M	null
Sum		N/A	77.8B	25112

Suggestion about regional cooperation between in PCGIAP members

Almost all responses (17 of 19) said yes for the question "Do you think having a regional/global framework similar to INSPIRE in Europe that imposes a mandate to each national mapping organization is necessary for the PCGIAP member countries to work more closely for the region/world?"

Among the 19 responses, 17 members kindly gave their suggestions on promoting regional cooperation between in PCGIAP members. These suggestions can be categorized into 4 aspects: data sharing, knowledge and information exchange, collaborative study/program, leadership enhancement.

Data Sharing

3 responses talked about data sharing. Bangladesh suggests countries need cooperation, Interaction and data sharing of similar nature. Indonesia points out increasing data sharing of country geospatial data can be benefit for the quality of cooperation. Japan emphasizes sharing of geodetic observation data across the region, and suggests there should be further encouragement to participate in the APREF/APRGP project and show a clear example of products based on the cooperative work to demonstrate the effectiveness of data sharing.

Knowledge and Information Exchange

There are 8 responses expressed the need of knowledge and information exchange with the other members. Brunei expects exchange informal and facilitate mobility of each member countries professions by a project. China suggests PCGIAP pay more attention on knowledge exchange and sharing between members by workshops and training courses. Japan specifically suggests PCGIAP exchange and share information concerning NMO's role and responsibilities for disaster responses, disaster mitigation/preparation strategies, and further proposes PCGIAP conduct dedicated meeting or forum on previous themes on a regular basis. Macao China, Mongolia, Nepal, Sri Lanka, Vietnam expect more information exchange with other members and technical support from PCGIAP.

Collaborative Study or Project.

3 countries expressed the necessity of carrying out collaborative study/project in PCGIAP. **Brunei** suggests PCGIAP come up with a project that involves member countries based on agreed criteria and standards, and hold that the project will enable member countries: 1)To exchange informal and facilitate mobility of each member countries professions; 2)To confirm to the spirit of member cooperation based on benefits through collaborative researchers; 3)To encourage, facilitate and establish commitment of technological transfer among member countries. **Indonesia** considers that necessary regional cooperation on managing of regional cases, such as earthquake, tsunami, floods, and forest fire, as well as geospatial data and information of the region is need to be established. **Malaysia** also states that regional cooperation is needed for studies on issues that impact on the countries in the region, including studies of forest fire burnings, the impact of global warming, and further expects PCGIAP to facilitate the undertaking of projects that benefit the members of PCGIAP countries. In addition, **Australia** also emphasizes established and agreed direction for coordination and collaboration.

Leadership Enhancement

Australia and Malaysia expressed the requirement of leadership enhancement of PCGIAP. Australia suggests PCGIAP promote participation by the key strategic position holders able to implement change in the governance framework. Malaysia states that a strong and committed leadership of PCGIAP and a highly efficient Secretariat is needed to push the good efforts of PCGIAP.

Appendix E

Workshop on

SDI & Disaster Management

By:

Workgroup 2 of PCGIAP

and NCC of I.R. Iran

Tehran

Iran

16-19 SEP 2012

Timetable of Tehran workshop in September 2012 under the title of **SDI & Disaster Management**

	8:30 (AM)	**10:30-12:00**	**14:00-15:30**	**16:00-17:30**	**After 17:30**
Sunday (16 SEP)	Opening	Class	Class	Class	-------
Monday (17 SEP)	Class	Class	Technical Tour		City Tour
Tuesday (18 SEP)	Class	Class	City Tour	City Tour	------
Wednesday (19 SEP)	Technical Tour (NCC)		Class	Class	Closing

General course syllabuses are as follows:

- Data Access Role in Disaster Management
- Data Integration
- SDI Concepts and its Applications in Disaster Management
- Applications of Geomatics in Iran

Each of the above subjects will be performed in one day.

Subsequently the registration form as well as contact information will be given.

Appendix F

The brochure of ICMSI conference

Overview

National Cartographic Center (NCC) founded in 1950s, is a governmental organization in Iran. NCC's priorities are centered on mapping, updating, uniting, and spreading out mapping enterprise and spatial data. In addition, NCC tries to promote technical expertise to enable co-operatives and expand research in the field of mapping and geospatial information.

This organization provides its members with key information through its publications, organizing meetings and workshops every year, with the aim in general of affecting co-operatives and allows discussion among co-operators from around the country.NCC facilitates contacts between co-operatives for trading purposes and intelligence sharing in a wide range of areas.

More widely, NCC holds National or International Geomatics Conference annually. The general themes of the Conference are Geodesy, Photogrammetry, RS, GIS, Hydrography and Cartography.

The prime goal of the conference is to promote international awareness of mapping, cooperative works through participation in international dialogue, and exchange participants' views, to strengthen the movement locally, nationally and internationally.

Therefore, the National Cartographic Center (NCC) of Iran is organizing the Second International Conference and Exhibition on Mapping and Spatial Information (ICMSI 2012) and the 19th National Geomatics Conference, on May 8-10, 2012.

We would be honored to have international experts from different countries at this conference.

Topics

Geodesy Themes
- Geodynamics
- Satellite Geodesy
- Geoid and Modeling the Earth's Gravity Field
- Insar

Hydrography Themes
- Bathymetry
- Water levels and flow
- Positioning
- Hydrographic data management
- Legal Aspects
- Offshore Seismic Surveying
- Remote sensing
- Military Hydrography
- Inland Waters hydrography

RS & Photogrammetry Themes
- Sensors: Image Data Acquisition and Calibration
- Remote Sensing Data Analysis and Modeling
- Close Range Data Analysis

GIS Themes
- Spatial Data Management and Mining
- Spatial Decision Support Systems
- Spatial Data Infrastructures
- Spatial Modeling, Analysis and Visualization
- GI-Technologies

Cartography and Geo-visualization Themes
- Theory of Cartography
- History of Cartography
- Cartographic Products
- Disaster Management andCartography
- Web Cartography
- Cartographic Application
- Cartographic Services
- Cartographic Visualization
- Other Cartographic Related Themes

Common Themes
- Education
- Applications

National Cartographic Center

2012 ICMSI

The second International Conference and Exhibition on Mapping and spatial Information (ICMSI 2012) and 19th National Geomatics Conference

8-10 May 2012
Tehran-Iran

Contact us:
Conference Secretariat:

Tel: (0098 021) 66071124 fax: 66071124
e-mail: icmsi2012@ncc.org.ir

Address:
Azadi sq, Meraj st, National Cartographic Center,
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