



Regional Committee of United Nations Global Geospatial Information Management for Asia and the Pacific

(UN-GGIM-AP)



Working Group 4

Cadastre and Land Management

Status Report from 2015- October 2016

for the

5th UN-GGIM-AP Plenary Meeting

17 October, 2016

Kuala Lumpur, Malaysia

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TERMS OF REFERENCE FOR WORKING GROUP4

Purpose:

Based on the resolutions of the 20th UNRCC-AP in Jeju Island (Republic of Korea, 2015), the Working Group was intended to act on land administration and management issues. These items were the objectives of WG4 Work Plan (2016-2018).

1. UNRCC-AP emphasizes that there are significant global developments addressing land tenure issues including the voluntary guidelines on the responsible governance of tenure, fit-for-purpose land administration and the continuum of land rights, as well as in geospatial and communication technologies, sensors and systems, these progress achieved has provided alternatives and hope that lingering land issues can now be attended to thus providing a feasible path towards making tenure systems work for all citizens, the quest to secure land and property rights for all and sustainable development.
2. UNRCC-AP also affirmed that geospatial information that is current, comprehensive and credible is essential for knowledge-based choices leading to better governance, management and administration of land.
3. Address the considerable land sector data and information deficit in existing geospatial information and national spatial data infrastructures, and consider innovative, participatory and affordable approaches, including volunteered information and promote fit-for-purpose data acquisition processes and technologies, to better identify, record and map people-to-land relationships leading towards the security of tenure for all.
4. Convene regional workshops and learning events to support capacity development, and promote the sharing of knowledge and good practices.
5. Participate in and partner with UNESCAP and Global Land Tool Network, as facilitated by UN-Habitat, and initiated by the Land Tenure Initiative for Asia and the Pacific.
6. All members should participate in any related referred actions, especially filling out and returning the questionnaires that had been distributed by the WG4 chairman.
7. Identify land problem in the AP-regions by analyzing results of the surveys using matrix analysis between demands (needs) and supply (capability)
8. Propose affordable framework and good-practices in AP-regions.
 - a. Identify the concepts and goals of land administration and management for AP countries.
 - b. Review and analyze the land administration efforts experienced in developing countries.
 - c. Share the results of reviews and get feedback on the distributed documents.
9. Disseminate good practices and enhancing training and capacity development
 - a. Propose the strategies for geospatial-enable land management, capacity building, and cost-effective implementations.
 - b. Disseminate the affordable framework and good-practices to get comments on and revise it.
 - c. Make a liaison with UN-GGIM Expert Group on Land Administration and Management.

1.1 Timeline

The work begins 2016 and continued through 2018

1.2 Membership of the Working Group

Chair:

Prof. Byung-Gul Lee, Republic of Korea

Vice-Chairs:

Mr. Ali Bakar Kasim, Brunei Darussalam

Mr. Zhao Yousong, China

Mr. Azamat Karypov, Kyrgyzstan

Dr. Teng Chee Hua, Malaysia

Mr. Gankhuyag Radnaabazar, Mongolia

Mr. Soh Kheng Peng, Singapore

Dr. Luu Van Nang, Viet Nam

Mr. Solomon Nata, Fiji

1.3 Responsibilities

The Chair of the UN-GGIM-AP WG4 will:

- (1) Develop more specific terms of reference based on each project,
- (2) Implement and complete work plans,
- (3) Report regularly on working group activities at the UN-GGIM-AP Executive Board Meetings, Plenary meetings, UNRCC-AP meetings,
- (4) Provide expert advice, on request, to agencies and organizations,
- (5) Lead discussions at relevant meetings,
- (6) Preparing Draft resolutions.

Vice Chairs of the UN-GGIM-AP WG4 will:

- (1) Carry out the Chair's duties in his or her absence,
- (2) Provide support and assistance to the Chair in carrying out his or her responsibilities,
- (3) Taking on specific responsibilities from the Chair.

1.4 Schedule and Work Process

Work-plan of UNGGIM-AP WG4 on (Cadastre and Land Management)

No	Activities/Steps	period	Targeted goals
1	<p>Identify land issues in Asia and the Pacific region</p> <ul style="list-style-type: none"> • Conduct the 1st and 2nd questionnaires; • Investigate status of land management situation in cultural, social, administrative and technical environments at different levels; • Analyses results of the responses using matrix analysis between demands (needs) and supply (capability). 	2015-2017	<ul style="list-style-type: none"> • 1st survey analyses draft in the middle of 2016; 2nd final report for land issues in the end of 2017.
2	<p>Propose affordable framework and good practices for Asia and the Pacific region</p> <ul style="list-style-type: none"> • Identify the concepts and goals of land administration and management for AP region; • Review and analyse the land administration efforts experienced in developed and developing countries; • Share the results of reviews and get feedback on the distributed documents; • Propose affordable framework and country profile considering existing standard model and approach for land administration and management by working with international organisations. 	2016-2018	<ul style="list-style-type: none"> • 1st draft in the end of 2016; 2nd draft in the end of 2017; final report in the middle of 2018. • Affordable framework and country profile will be finalised by the middle of 2018 through cooperation effort among chair and vice-chairs' countries.
3	<p>Disseminate good practices and enhancing training and capacity development</p> <ul style="list-style-type: none"> • Propose the strategies for geospatial-enable land management, capacity building, and cost-effective implementations; • Disseminate the affordable framework and good practices to get comments on and revise its; • Make a liaison with UN-GGIM Expert Group on Land Administration and Management; • Hold regional workshop, training and seminars. 	2016-2018	<ul style="list-style-type: none"> • regional workshop in conjunction with UN-GGIM-AP Plenary meeting contributed by Malaysia Vice-Chair of WG4 • 2 or 3 training or seminars co-organised with international organisations(UN-Habitat/GLTN, UNESCAP, ISO/TC211 and etc.) or liaison group (UN-GGIM).

What are we doing our process?

The activity we will carry out consists of three fields in big picture and it will continue until 2018. The contents of the activity in each field will be carried out in accordance with the work flow chart (Figure 1) below.

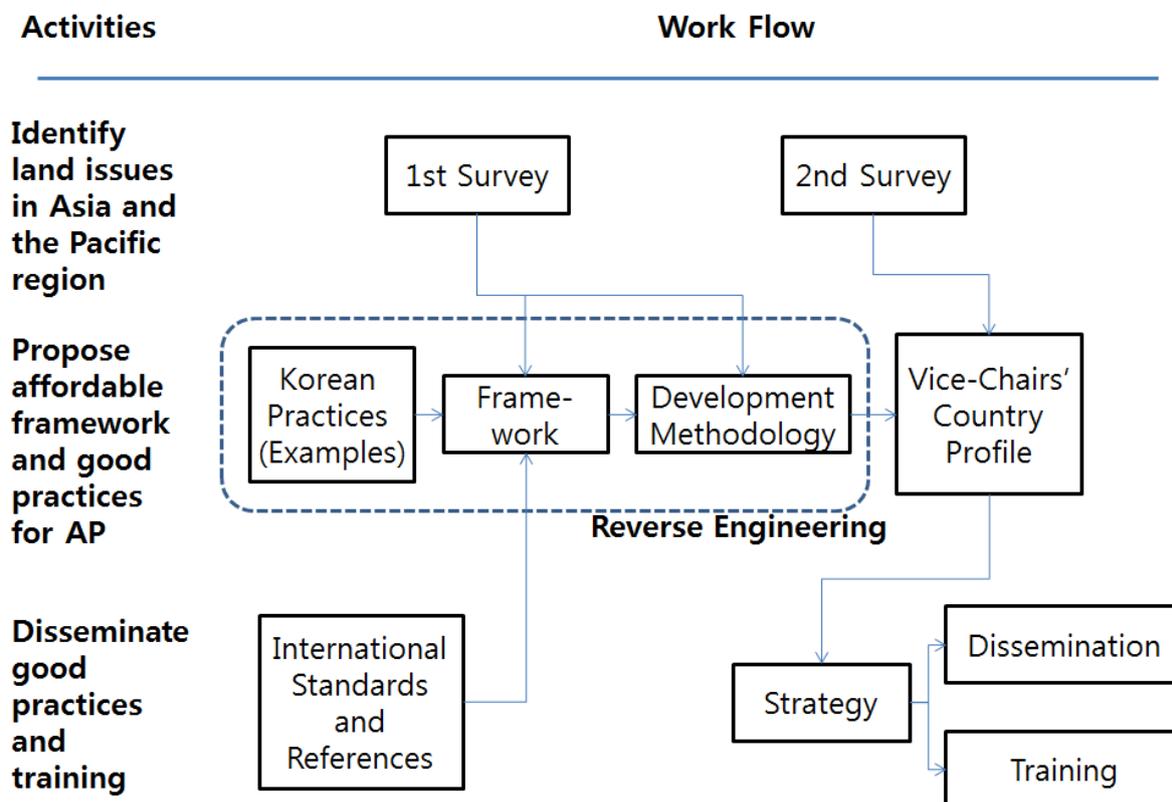


Figure1. Work Flow for WG4 process

Identify land issues in Asia and the Pacific region

- **1st Survey:** It will investigate the cultural, social, administrative and technical environments of several countries in Asia and the Pacific region, which are at different levels among them.
- **2nd Survey:** It will carry out the investigation on application measures taken for each country regarding the primarily developed frame work and development methodology. Due to the reason that the circumstances of each country differs from one another, we made the judgment that unitary application was not feasible. The investigation is performed in order to establish a standard which allows us to differentiate the application method depending on the form of each country.

Propose affordable framework and good practices for Asia and the Pacific region

- **Korean Practices:** A case analysis of Korea is carried out. In Korea, the land information related system has been constructed since 1995. In total, five or more systems have been developed and integrated until now, and land information is now completely digitalized and managed. By carrying out the case analysis based on the systems developed in Korea, we would like to propose basic analysis materials for framework and development methodology.
Since abstract framework and development methodology are developed through the case analysis, we will use Reverse Engineering method to prepare the foundation for the analysis.
- **Framework:** It suggests the direction regarding the basic system and the structure necessary to informationize the management of land information.
- **Development Methodology:** It will be proposed to concretely develop the relevant country, making the frame work suitable to the form of that country. Since the environment of system construction differs depending on countries, with this factor considered, a generalized and abstract methodology will be developed. The necessary activities for each stage of system construction will be defined and explained. Besides, the order of defined activities is systemized so that they will be performed consistently and the performing method will be explained. In the case that templates are needed when system development process is directly carried out, various templates will be developed and provided.
- **Country Profile:** It is actually impossible to apply unitary development methodology on every country equally. Therefore, a suitable method for the application of methodology should be proposed, distinguishing the form of each country.

Disseminate good practices and enhancing training and capacity development

- **International Standards and References:** The examination on various international standards related to the construction and management of land information will be performed. The current WG4's contents of performance conform to the international standards and we will make an effort to make them have international compatibility.
- **Strategy:** We will establish a strategy which enables us to apply the developed methodology on each country and the application will be made on each country accordingly. The application will be first performed mainly on the active member countries of WG4 and sufficient examination will follow.
- **Dissemination and Training:** We will have the developed model extensively disseminated to utilize. In addition, the provision of necessary knowledge and information and education will be performed. If needed, proposals will be made to international organization through international standards, international technology report and etc.

2. ACTIONS TAKEN BY WG4

Background

Many countries in the world are performing efficient management and application of land utilizing spatial information.

For the common prosperity of humanity, UN is putting emphasis on the efficiency of land management from global aspect. For this, many countries of the world are continuously inducing the construction and utilization of land and spatial information.

For efficient land management and operation through constructing land information system, in Asia and the Pacific region as well, carrying out the common goal like this is one of the most essential duties we have in our region

However, there are so many different countries existing in Asia and the Pacific region and there are different political, social and economic backgrounds among these countries. This causes the limitation on constructing unitary form of land management system.

Besides, we are now confronting the situation that the countries of which land management systems are not constructed have much interest in their related countries' system model or construction method of land management inside their region..

Considering this situation, a model which can share past experiences should be made for the development and dissemination of land information. Based on this, invigorating intraregional discussion could be a very effective measure.

Therefore, we, WG4, on the basis of WG4 chair, would like to share various intraregional opinions by establishing the framework for land management and development methodology. (land information methodology)

Why Land Information has to be based on NSDI ?

For the construction and utilization of land information, relation setting with NSDI (National Spatial Data Infrastructure) is very important.

It is because NSDI contains overall topography related information and precisely expresses the spatial changes caused by natural phenomenon. Therefore, the management of land should be performed based on NSDI and land and cadastral information must be constructed based on the foundation that is identical to the foundation of NSDI or they should maintain the connection between them.

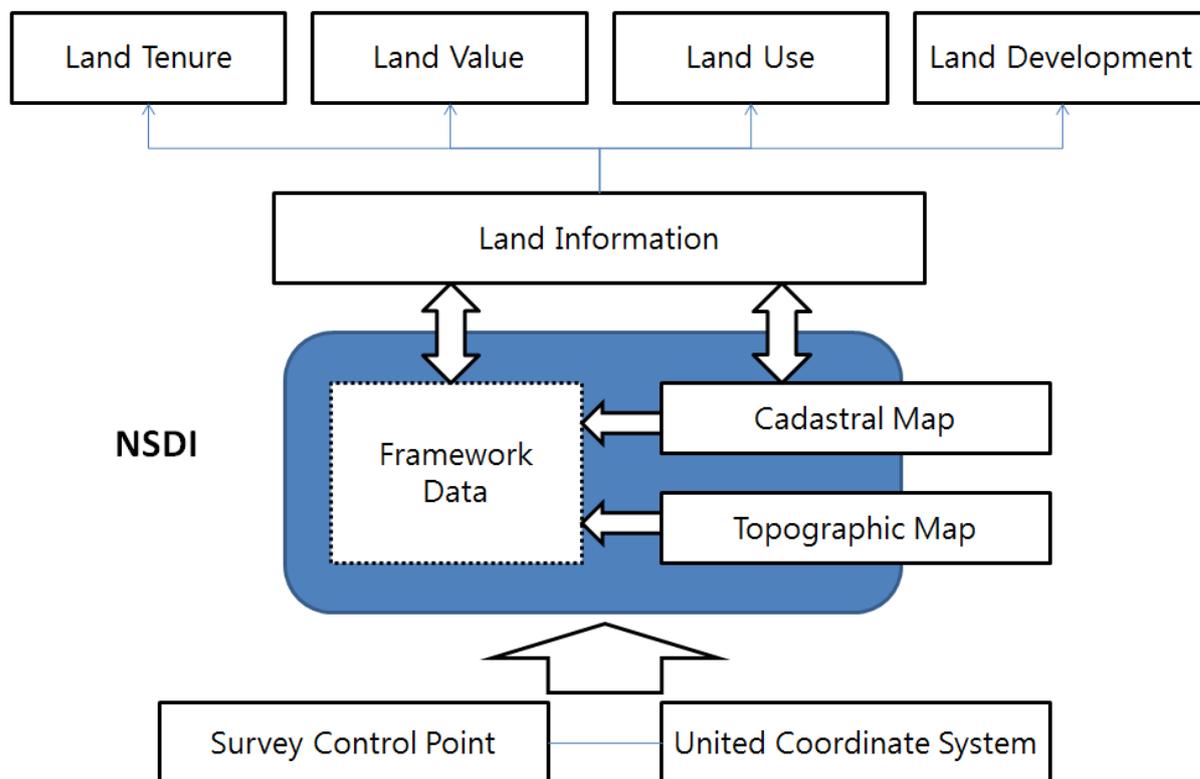


Figure 2. Land Information and NSDI

In general, a country constructs topographic and cadastral maps based on the same survey control point and united coordinate system, which is the fundamental elements of land management and usage, and it can use key information necessary for national management by defining them as framework data. When this domain is called NSDI, land information should be the information based on NSDI and should allow information users to use any land related services by linking them to NSDI.

Identify land issues in Asia and the Pacific region

The 1st survey is in progress of investigation. Nine countries in Asia and the Pacific region are the survey participants and the contents of the investigation are the same as the following.

- The current state of the country in general: population, the area of land, the form of land usage
- The land related law and system
- The ownership of land and topographic map/cadastral map

- The registration and construction of land information
- The utilization and service of land information
- The information system and environment of land management

The investigation results of the 1st survey will be released after April when the survey is finished. The results will be released with the document which contains the contents of related status or they will be provided through conference or other means.

Propose affordable framework and good practices for Asia and the Pacific region

The analysis on Korea's case of land information system construction was carried out. If we take a look at the summary of Korea's current state of performance, it is as follows,

Since 1990's, PBLIS(Parcel Based Land Information System) which is for the registration and management of land based on parcel and LMIS (Land Management Information System) were constructed and have been operated for utilizing land information in land policy and administration in Korea.

In 2004, these systems were integrated and constructed into one system called KLIS(Korea Land Information System).

Since then maintenance was carried out until 2011. In 2011, the advanced KLIS (Korea Land Information System) was developed. With this, the establishment of a system which integrates even various administrative information of local area was completed. Using this system, currently various land policy, information management, real estate management and etc. are performed.

Through the analysis of Korea's case, we could gain various experiences regarding the construction of land information. If there were any important lessons we learned from the analysis, they are the same as the follows.

- The land management system is the system that requires a strongly committed political will to construct.
- For the land information system, the design for the system of land information construction and the country's management system is important.
- The system of base map such as NSDI, topographic map, cadastral map and etc. should be concretely constructed.
- Any land management related system should be integrated and constructed in unitary system even though there was a preexisting system.
- The service which is utilizable in any location of the country should be developed and the

complementation of data is essential.

- When the system of national unit is constructed, the examination on the agent of securing budget and the method of securing budget is necessary.

By analyzing the case of past experience and performing the analysis on international standards, we prepared the draft of land management frame work.

The development methodology which is a concrete process to construct a framework is currently in progress and we would like to develop a generalized and abstract methodology reflecting the result of the first survey and other data.

Disseminate good practices and enhancing training and capacity development

In order to develop the framework and methodology utilizing related international standards, the examination on international standards and De Facto Standards is necessary.

In order to prepare a technical document which is in accordance with the international standards, the examination on related techniques was performed at WG4. The documents included in the examination so far are the same as the following.

International Standards

ISO 19152 : Geographic Information – Land Administration Domain Model

ISO/IEC 19746-1~4 : Information Technology - ODP -

FIG

Publication No.52 : Social Tenure Domain Model : A Pro-poor Land Tool

Publication No.60 : Fit-for-Purpose Land Administration

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The contents of the examined documents are included in the system framework and development methodology referring to relevant contents. The included contents will be expressed in relevant contents when the technical document is presented.

3. FRAMEWORK AND METHODOLOGY

Framework

Purpose

The land management system's framework is a standardized land related information model. This will provide a consistent guideline and a system for reference in the process of integrating each developing environment and support to realize services utilizing the standard.

If information resources and service developers refer to the framework, it makes the analysis on the list of standards and the requirements of each development stage easy by providing intuitive and efficient methods. It also can be used as a precedent guideline which enables them to anticipate the examination on interoperability.

Scope and Contents

The framework consists of four reference models and the implementation related document details. The form of standard reference model consists of business reference model, application reference model, data reference model and technical reference model as Figure 3 below demonstrates.

Reference Model Structure

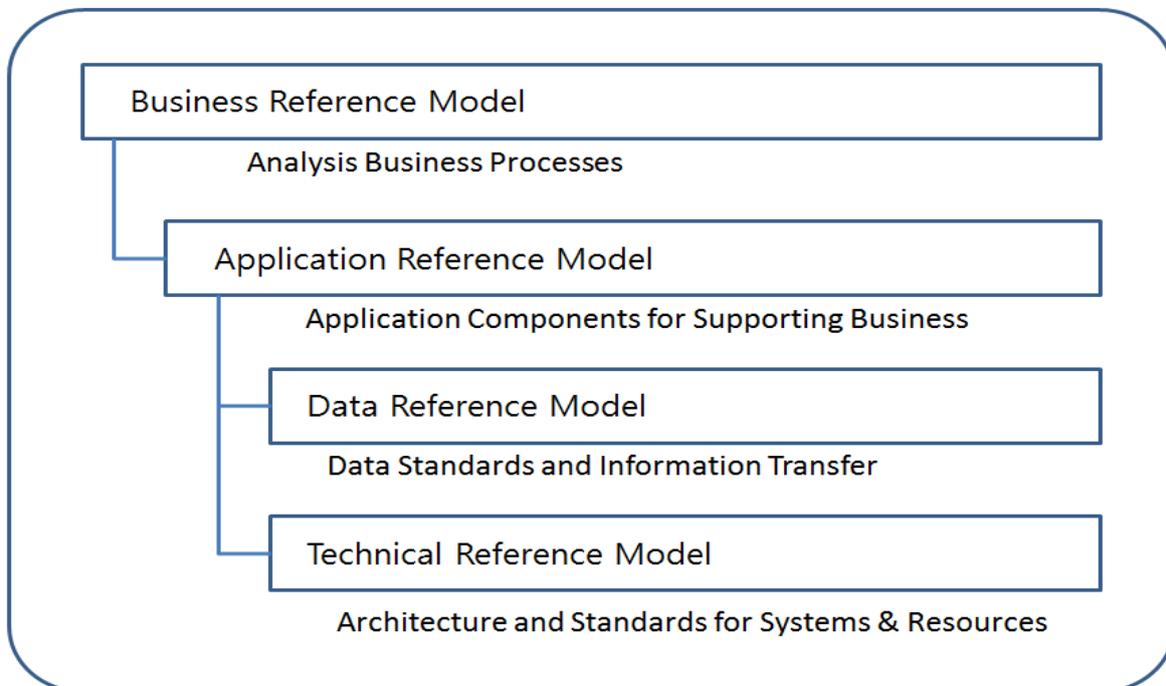


Figure 3. Framework for Land Information Management System.

The business reference model is a reference model which defines the independent functions of tasks at each organizational unit. The business reference model is made analyzing the roles and the functions of an organization and the overall operation system is constructed by relating them to the functions of the application reference model. The business reference model includes some domains of tasks according to the function of an organization and overall demonstrates the roles, functions, and the flows of information among organizations. It is necessary for the To-Be model, which is made for the future, to perform BPR(Business Process Reengineering) on the preexisting organization of operation and the changes in tasks of the preexisting organization can occur.

The application reference model is a reference model which defines mainly the functions of tasks that should be independently performed from certain institutions. The application reference model is a function-oriented approach which is irrelevant to organization and it could be used as a standard to define other architectures. The application reference model divides the whole task into the domains of a couple of task functions. Each domain of task function is again divided into a couple of task units and each task unit is divided into detailed tasks. The task unit defined by the business reference model can be described as an integrated form of comprising unit tasks in order to carry out a certain goal rather than it is performed by a certain institution. Each task function is expressed at the form of organization in the business reference model and it forms the connection between organization and task.

The data reference model is a set of standard data to carry out the business reference and the application reference models. It is used to express all the information necessary for land management. In the case of using the data reference model, we can efficiently manage the data, prevent the duplication of data and it can be efficient for making connection with preexisting and external data. If we refer to the preexisting data model when defining the data model of land management system, we can enhance the accuracy, reusability and connectivity of data and save the time and cost incurred by defining a new data model. Besides, we can prevent the omission and duplication of information utilizing already proposed reference model while new data modeling is carried out. In addition, we can also check the errors of data model and supplement them utilizing previously verified data reference model.

The technical reference model is a standard to operate the land management system and design technical infrastructure and the architectures of the hardware and software. The hardware and software which construct the system should be designed separately. In hardware architecture, the standards for the performance and capacity of data processing equipment and network should be presented. In software architecture, the type and functions of the software needed to construct the system and the considerations for introducing the software should be presented. It is hard to generalize the hardware and software architectures since they can be designed differently depending on the circumstance of each country. Therefore, the reference model here is presented to the extent that basic structure and functions are demonstrated.

Methodology

The final reference model suitable for the relevant country will be made going through the process of stage by stage implementing each model of the four reference models presented in the framework. At that time, the final result can be drawn from the process of independent methodology for each reference model respectively, but there is a large part of factors that is related to one another between the stages of the methodology. Therefore, there should be an order of priority set between the stages of the methodology and its process should be designed so that overall result for the whole model which consists of the four models can be drawn.

In the methodology, the factors of each stage to develop the four reference models above should be listed and arranged in order to develop a method to coherently carry forward the whole task.

This process will be constructed as a methodology once the development processes for each reference model are drawn, arranged and they are put together.

4. Further work plan

The proposed work plan for the coming year is as follows

(Items 1 & 2 have been started):

Operation items	Executive manager	Time table		
		2016	2017	2018
<ul style="list-style-type: none"> ● Design and development of affordable framework and land information methodology: pilot project. 1. Propose the architecture of the first draft framework <ul style="list-style-type: none"> a. Identify land issues in AP region by two times of survey. (contributed by 8 Vice-Chairs) b. investigate the received architecture of the land management process to establish the affordable framework of the land information system. 	<p>The chair with the cooperation of the vice-chairs</p> <p>(Brunei Darussalam, China, Kyrgyzstan, Malaysia, Mongolia, Singapore, Vietnam, Fiji)</p>	<input checked="" type="checkbox"/> (items 1 to 6)		

<p>2. Disseminate good practices and enhancing training the capacity development.</p> <p>a. examine the international standards and references</p> <p>b. establish a strategy which enables us to apply the developed methodology on each country</p> <p>c. Disseminate and enhancing training through workshop in conjunction with UN-GGIM-AP Plenary meeting in Malaysia</p> <p>3. Establish the final first draft of land information framework and methodology.</p>				
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