

Why Copying LIS from a Developed Country Does Not Work for a Developing Country?

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Key words: land administration, land information systems, spatial data infrastructure and digital cadastral data base.

SUMMARY

FIG and other international organizations have demonstrated that a land administration system (LA) and its supporting tool—Land Information System (LIS)—play a key role in sustainable socio-economic development of a country. This is because land, one of the major objects of the system, continues to be scarce and therefore more valuable.

LA and LIS are very well established in many developed countries including the Netherlands, Australia, Germany, Canada and Sweden. Many donors and funding organizations have supported developing countries to build such systems. Developing countries are also eager to have such systems. Projects, to implement and establish LIS, have often replicated systems from developed countries.

The authors of this paper have considered some aspects of the institutional arrangements, legal conditions and user demands of a LIS as they relate to Vietnam. They believe that the distinctive characteristics of this developing country, which create the failure of copying, are identified as:

- LIS in Vietnam requires a multi-faceted (theme and resolution) spatial data infrastructure, which is different from a parcel based system (single-solution) of LIS in many developed countries. The spatial data infrastructure allows for capture, maintenance and use of data for different themes for different management levels of nation, province, district and commune¹.
- LIS in Vietnam is not only a tool for land registration and the land market but also a land policy monitoring system for the next re-adjustment and modification to achieve the societal goals of poverty reduction, environmental protection and sustainable socio-economic development.

A developing country, due to its institutional arrangements and the interplay with a range of social structures, has a greater need to gain a holistic view of the landscape with its economic

¹ National Spatial Data Infrastructures are not new and many developed countries claim that they have one. However in practice there are very few holistic NSDIs in existence. At best there is usually a limited parcel based graphical system providing for a number of themes with little institutional coordination, spatial compatibility or operational integration. There are exceptions.

and social implications. The LIS suitable for developing countries must be capable of providing a sound base for economic and environmental planning. This is certainly the theory in developed countries but there is little evidence that it is so in practice. Accordingly developing countries may require a more complex approach to an LIS than the relatively simple use of the LIS in many developed countries.

SUMMARY (Vietnamese)

FIG và các tổ chức quốc tế khác đã chứng tỏ rằng Địa chính (LA) và công cụ của nó - Hệ thống thông tin đất đai (LIS) - đóng một vai trò quan trọng trong phát triển kinh tế xã hội bền vững của một đất nước. Điều này là do đất đai, một trong những nội dung chính của hệ thống, càng ngày càng trở nên khan hiếm và có giá trị.

LA và LIS đã được thiết lập rất có hiệu quả ở các nước phát triển như Hà Lan, Úc, Đức, Can Na Đa và Thụy Điển. Nhiều nhà tài trợ và các tổ chức tài chính đã hỗ trợ các nước đang phát triển xây dựng các hệ thống như vậy. Các nước đang phát triển cũng rất mong muốn có được một hệ thống tương tự. Các dự án này phát triển hệ thống LIS nêu trên, thông thường là sao chép lại các hệ thống từ các nước phát triển.

Các tác giả của bài báo này lại quan tâm một số khía cạnh về thể chế, cơ sở pháp lý cũng như nhu cầu sử dụng của LIS khi triển khai ở Việt Nam. Họ tin rằng những điều kiện đặc biệt này của nước đang phát triển sẽ làm cho việc sao chép nói trên không thực hiện được với các lý do sau:

- LIS ở Việt Nam là một hệ thống đa cạnh (về thông tin thuộc tính lẫn độ phân giải không gian). Điều này hoàn toàn khác biệt với LIS ở các nước phát triển là một hệ thống đơn cạnh dựa trên cơ sở đơn vị thửa đất. Nó đòi hỏi một hệ thống cơ sở hạ tầng thông tin không gian cho phép thu thập, quản lý và sử dụng dữ liệu cho nhiều cấp quản lý nhà nước, như trung ương, tỉnh, huyện và xã.
- LIS ở Việt Nam không chỉ là một công cụ sử dụng cho mục đích đăng ký đất đai trong thị trường đất mà còn là hệ thống giám sát chính sách cho các lần sửa đổi sau này để đạt được các mục tiêu xã hội như xoá đói giảm nghèo, bảo vệ môi trường và phát triển bền vững.

Ở một nước đang phát triển, do hệ thống thể chế cũng như sự đan xen giữa các cấu trúc xã hội nên cần hơn hết một cách nhìn toàn cảnh, chính xác các tác động của kinh tế xã hội lên phát triển LIS. Do đó hệ thống LIS cho các nước đang phát triển cần phải có khả năng cung cấp số liệu cơ bản cho việc xây dựng kế hoạch phát triển kinh tế và bảo vệ môi trường. Đây thực sự là một nội dung lý thuyết ở các nước phát triển nhưng chưa có bằng chứng cụ thể nào cho sự hoạt động của nó trong thực tế. Có lẽ và do đó, các nước đang phát triển yêu cầu một cách phát triển LIS phức tạp hơn cách thức đơn giản hiện nay đang áp dụng ở các nước phát triển.

Why Copying LIS from a Developed Country Does Not Work for a Developing Country?

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1. INTRODUCTION

1.1 General

FIG and other international organizations have demonstrated that a land administration system (LA) and its supporting tool—Land Information System (LIS)—play a key role in sustainable socio-economic development of a country². This is because land, one of the major objects of the system, continues to be scarce and therefore more valuable.

LA and LIS are well established in many developed countries including the Netherlands, Australia, Germany, Canada and Sweden. Many donors and funding organizations have supported developing countries to build such systems. Besides, developing countries also are eager to have such systems as soon as possible for their countries. Projects, to implement and establish LIS, have often replicated systems from developed countries. However, statistical data and practice have shown that the number of successes is very limited, except perhaps for Malaysia and Thailand³. Vietnam has not shown itself, to date, as being suitably positioned to adopt a developing country's style of LIS. This paper, therefore, has attempted to ascertain why copying an LIS from developed country does not work for a developing country.

Before going into detailed discussion, we consider LA as the processes of determining, recording and disseminating information about the tenure, value and use of land when implementing land management policies (UNECE, 1996). LIS, defined by FIG, is a tool for legal, administrative and economic decision-making and an aid for planning and development which consists, on the one hand, of a database containing spatially reference land-related data for a defined area, and, on the other hand, of procedures and techniques for the systematic collection, updating, processing and distribution of the data. In short, we consider LIS as a tool for LA implementation and, in practice, to offer the opportunities for serious strategic national planning.

1.2 Paper Approach

Many previous researchers have offered answers already to the question of why copying LIS from a developed does not work for a developing country. Researchers and decision-makers have recognized the difference of LIS, LA and cadastral systems between a developing and a developed country. For example, in the very early stages of information technology

² The Bathurst Declaration claimed that Sustainable Development without effective Land Administration is simply rhetoric and will not happen.

³ However, in these two countries, prevailing conditions at the time of Western LIS intervention were vastly different from those usually found throughout Asia.

development, scholars have used the term of “*an appropriate*” when discussing an LIS for developing countries [Jeyanandan, Williamson & Hunter, 1990]. Recently, when discussing such appropriate systems for African countries [Fourie et al, 2000] identified two key requirements for LIS in developing country:

- Needs to be extended to the poor, and
- Needs to accommodate a range of identifiers not just parcels.

However, these researchers tend to explain the lack of success of copying for reasons which include unclear land policy, poor legal framework, lack of human resources and the impatience or enthusiasm in copying a system. Such conclusions are readily found at the end of any research paper or LIS project implementation report, [Williamson, 1994], [Helge, 2003], and [Mika, 2003]. For example, Mika states that to come up with a successful LA, it requires good *governance (clear policies, proper organization, no corruption), adequate resources, a culturally sensitive approach, equity, etc. Or if not, then it should prepare less ambitious goals and merely prepare a land policy, create a simple unified land administration organization, recognize and support customary tenure structures, aim at a fair and gradually improve register of deeds with simple...*

In contrast, the authors of this paper consider that the unclear legal framework, improper organizations, different technical requirements and bureaucratic systems are entrenched (and unlikely to change in the foreseeable future) characteristics for a developing country. Of course, we agree that such existing characteristics should be adapted and revised but it will take a certain time to come up with a legal framework and the conditions as the West have today⁴. Therefore, we believe that a LIS has to be designed to operate and to exist in a *floating or dynamic* environment instead of what some would consider a well developed and relatively stable environment. Indeed the authors would conjure that there is a different intellectual approach to planning, both at the strategic and tactical levels, between the developed and developing countries with an emphasis being placed in developing countries on incremental and opportunistic planning, resulting in an extended period for strategic planning and a short time span between tactical planning and operational implementation. Therefore a dynamic environment is more appropriate to many developing countries, certainly Vietnam.

The authors will describe briefly some relevant aspects of LIS-one in each of a developed and a developing country-in Sections 2 and 3 to further their hypothesis. Then we will consider the difference in legal framework, business area application and technical requirements for LIS in developing country in Section 4. In Section 5 we will offer a conclusion.

⁴ One should seriously question the need for well established cultures like the Vietnamese to ever completely adopt the current trends and structures of the West. LIS content, focus and institutional arrangements should surely be relevant to the history, culture and mores of the subject country and not adopt systems (some are still relatively novel) which are alien to the essence of the country.

In all, it seems necessary to conduct more research at local level by national reviewers into the appropriate manner to achieve appropriate intervention and adoption of relevant LIS into the accepted and evolving institutional arrangements in Vietnam.

2. LAND ADMINISTRATION AND LIS IN A DEVELOPED COUNTRY – AUSTRALIAN CASE

2.1 Land Policy and other Relevant Socio-Economic Development Strategy

The LA situation in Australia since European Settlement in the late 18th Century has been fragmented due to the initial creation of individual Colonies, later to become States of a Federation which was formed in 1901. The significant difference between Australia and Vietnam, in this regard, is the lack of any direct control by the Federal Government over LA, or for that matter over the ownership of or rights in land other than that expressly dedicated to or purchased for Commonwealth use.

Accordingly, cadastral issues are the responsibility of the States and until recently the mapping of States and any cooperative measures, which were taken to avoid duplication of such things as near border aerial photography, were done through voluntary agreements between the states and the relevant organization within the Commonwealth Government.

However, there are certain international Treaties and Agreements which the Federal Government has entered into which are binding on the States in relation to land and land use. Other intergovernmental bodies such as the River Murray Commission, the Great Barrier Reef Authority and the Courts of Australia also have a major impact on policy and decisions in relation to the environment, the use of the major river systems of Australia, the coastal and international waters adjacent to Australia, forestry policy and aboriginal lands. The Federal government has also taken steps to protect the environment through international treaties, agreements with the States and direct funding to alleviate or prevent major problems such as the destruction of forests, pollution of waterways and provide for alternative employment initiatives to safeguard the environment.

2.2 Institutional Structure

The institutional arrangements in the States which are responsible for LA in Australia have been specific to each State. Various bureaucratic responsibilities were initially allocated based on usual government activities like mapping and surveying, land registration, agriculture and road construction. Having a common background has resulted in similar land related legislation and practices for the demarcation, allocation of land and land market procedures throughout the country. The early land law was based on British Law but significant changes occurred in 1859 with the adoption of what became known as the “Torrens System”. It was considered more appropriate for an emerging country and the characteristics of the system have been widely adopted in the region and elsewhere.

As LIS were identified in the 60s there was little coordination of direction or systems within government. Each agency simply adopted LIS as a means to improve its own performance. The surveying agencies attempted to introduce standards and procedures but these, until recently, were not seen as essential. During the last 20 years there have been significant moves, both in the government and the private sector, to rationalise the acquisition and maintenance of the LIS. There have also been major initiatives to contract this work to the private sector.

Within government there has been a trend recently to merge agencies of a like nature. This has applied to the linking of such agencies as land administration and the environment, along the lines adopted in Vietnam and the nearby region. Simultaneously there has been an attempt to coordinate and maximize the LIS resources in each State and at the Commonwealth level. Most States had, certainly until recently, centralized operations for land registration whilst the mapping, surveying, land allocation and valuation were usually decentralized.

2.3 LIS Trends and Their Priority in Development Plans

LIS was, from a cadastral viewpoint, developed from the available cadastral mapping and the cartographic output was digitized. This was then given a degree of graphical or/and ground control and each State produced a digital cadastral data base (DCDB) utilising the best available mapping source. In turn cooperative efforts were made to plan for an upgrade path to reengineer these early DCDBs. The DCDBs have been aggregated into a national cadastral product by the Public Sector Mapping Agencies Australia (PSMA) which was created from all the jurisdictional mapping agencies in Australia. The PSMA has now cooperatively built a number of other national data sets like the road system and a national geocoded address file for every parcel. These initiatives have created a national spatial data set and provided access and value adding for the government and the private sector. It has provided the basis for other environmental themes and for commercial use.

3. LAND ADMINISTRATION AND LIS IN A DEVELOPING COUNTRY – VIETNAM CASE

3.1 Land Policy and Legal Framework for Land Dealings is Evolving

The first land law in Vietnam was passed by the National Assembly in the year 1987. However, it was not until the land law 1993, that Vietnam recognised the five rights to 1) exchange, 2) transfer, 3) lease, 4) inherit and 5) mortgage of land use rights for the individual and the household. This policy has brought remarkable results:

- Vietnam has moved from an importer of food in 1986 to the second country in the world for rice exportation, and
- From 58% of the Vietnam population living in poverty in the year 1993 to 37% in the year 1998 and to 29% in the year 2002 [WB, 2004].

These respectable and significant results do not mean that the Vietnam legal framework fully meets the requirements of the existing society. The legal framework for dealing with land is on-going and will be refined year by year and from time to time⁵ to meet the socio-economic imperatives. It is a development in progress⁶ and should be cautious in nature. The Land Law has been modified and adapted to the social needs many times in the years of 1998, 2001, 2003 with the likely adoption of a new Land Law in 2005. For each version of the land law passed, there are corresponding decrees, circulars and decisions issued as land law implementation guidelines, which will ultimately result in a Land Code. Up to now there are five decrees supporting the Land Law 2003. However, it is believed that the number of such land law implementation guides will increase in the future. For example, the concept of land use rights ownership described in the land law 1993 has been modified by subsequent versions in the year 1998, 2003 and being implemented at the local level on 15th November 2004. It will change or be amended again for the next version of land law in the year 2008.

To come up with those changes and modifications, Vietnam needs more time to experiment, to experience, to practice with those new concepts in order to measure their effectiveness. It is an indispensable part of development in history.

3.2 Institutional and Organization Structure

LA is carried out in Vietnam through a hierarchical structure of four administrative management levels.

Figure 1 describes this structure by two streams on the left of the diagram. The first stream on the left is the Government at national level and subsequently the People's Committee for each of the provincial, district and communal levels. On the right hand side, the administrative structure begins at the Ministry of Natural Resources and Environment then flows down to local level through Department, Division and the local officer. In this system, the left side acts as the decision maker and the right hand side as the technical support. According to the Land Law, each level has a different duty, mandate and responsibility in dealing with LA [Land Law 2003].

The right triangle in Figure 1 shows an estimation of staff working for land use planning, land registration and land use statistics for LA system. Approximate number of staff working for each level is: 50 for national level, 10 for provincial level, 5 for district and 1 for communal level.

⁵ The frequent use of the term "Step by Step" when discussing all manner of progress in Vietnam reflects this evolutionary approach and an awareness of gradual, responsible and controlled change.

⁶ Democratic processes have been introduced over several hundred years in the "natural" course of events in the Western societies whereas the boiler room approach in Singapore, South Korea, Malaysia and Taiwan have been achieved in several decades. These rapid transitions have brought economic growth but with significant social disruption or stress.

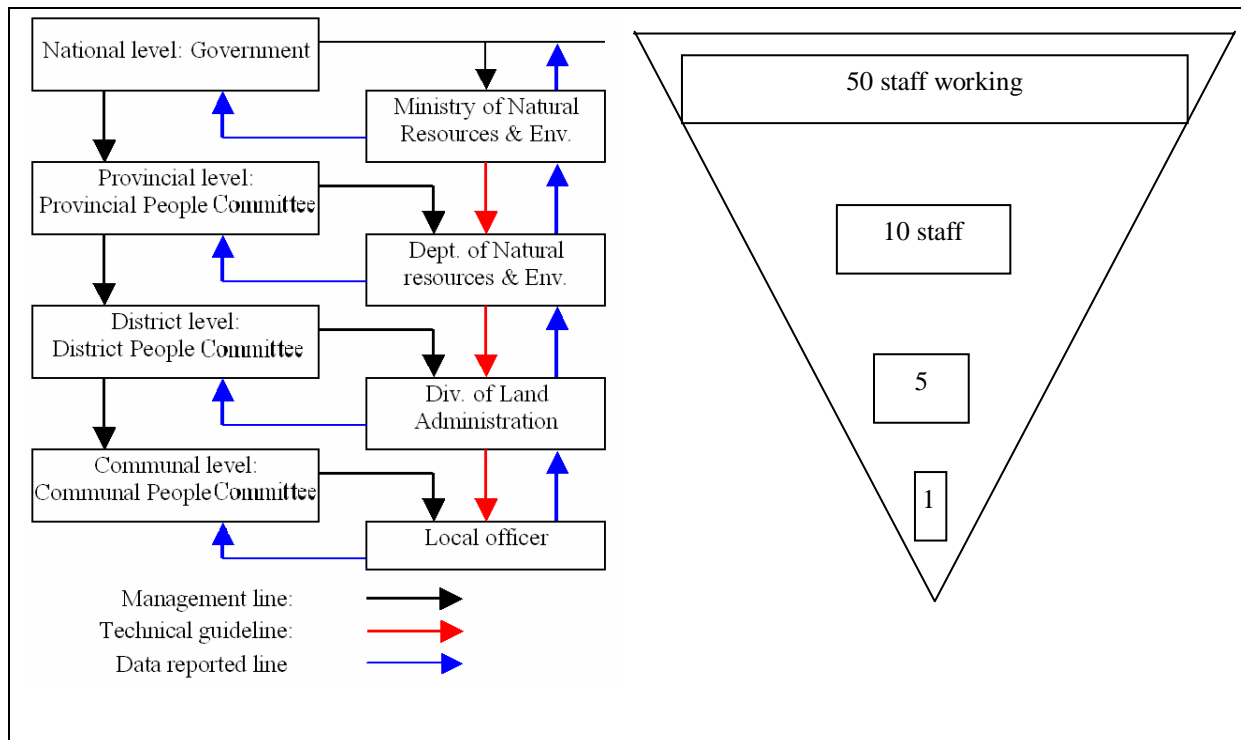


Figure 1: The Hierarchical system of LA in Vietnam and the number of staff working at each level in LA

3.3 Land Information System in Vietnam

LIS as well as land registration is not a new concept in Vietnam since the first introduction of five land use rights in the year 1993. In consequence, demand of an automatic system (LIS) and the pressure of having to employ information technology such as GIS and digital mapping, have created a strong LIS presence in Vietnam. The Vietnam government has spent considerable efforts and budget for LIS establishment at national and provincial level. For example, there are several applications working for LIS which have been developed by government budget and by government agencies, such as Famis CaDB (for automatic mapping & land registration) in the year 1997, CLIS and ViLIS in the year 2003.

Besides, in a more systematic approach, the Vietnam–Sweden Program on Land Administration Reform (CPLAR) funded by the Swedish International Development Agency (Sida), has supported a comprehensive program dealing with land and land administration. This program including an LIS component started in 1997 and ended in 2000. PLIS—a program LIS product—was designed and tested at four pilot provinces: Thai Nguyen, Ha Nam, Dong Nai and Soctrang [CPLAR, 2000]. The Strengthening Environmental Management and Land Administration (SEMLA) Programme, also funded by Sida and launched in November 2004 will extend the overall approach to LA and specifically extend the development of both the environmental and land information systems.

4. DISCUSSION

Answer to Question why Copying LIS from a Developed Country does not work for a Developing Country

4.1 Reason 1: Different Legal Framework and Institutional Arrangement.

The LIS in Vietnam has to develop and operate in a legal framework and within institutional arrangements which are undergoing continuous change as they adapt to the demands of society. All these decisions or legal documents need a certain time to fit, to adjust, to mature and to merge with the real situation in practice. In many cases, some procedures or some guidelines are not implemented at local level, even when they are carried out by manual means. For example, a decision required that all cadastral documents were to be archived in four copies at four administrative levels. This has failed since the time of its approval! On the other side, LIS is a computer system, which is only manipulated smoothly if the procedures and steps of doing a task are clear. This is often not the case and therefore inconsistent practices emerge which take time to evaluate and monitor. Timings and performance may not be met due to the reality of the physical environment like the failure in the supply of power or the absence of electronic communications.

LIS has to work with many administrative clients. Figure 1 shows that Vietnam LIS has to deal simultaneously with eight clients at four levels of the system. This institutional arrangement will be refined again and again in the future. LIS, however, should not wait until such perfect arrangements, to start to supply land information to the end user, are in place.

Human resources are limited at the local level (see the base of the triangle in Figure 1). There is a significant number of officers working at national and provincial level but rather limited for district level and communal level. In practice, the national and provincial levels require much general land information, which are obviously only available at district and communal levels. In summary, LIS in a developing country have to run in a *floating* environment of evolving legal frameworks and, often, inadequate and changing institutional arrangements.

4.2 Reason 2: Different Scope and Business Area of LIS

The geographical business area of LIS in a developing country will be different from a developed country. Since the beginning of implementation, LIS has covered all kinds of geographical areas of Vietnam, which vary in cultural, geographical, and socio-economic conditions. It is often suggested at the beginning stages of project implementation, that LIS should concentrate more in urban and rural area for land market activities⁷, [Helge Onsrud, 2003]. However, LIS and LA in Vietnam has to firstly service the poverty reduction strategy, which will be spread through rural, urban, remote area and mountainous areas, [Inter-Ministerial Poverty Mapping Task Force, 2003]. This is because poverty reduction is one of

⁷ These are the areas where economic gains, through land tax, transaction fees and general land market activities can be harvested more rapidly.

the highest priorities in the socio-economic development plan of Vietnam Government up to year 2010.

However, the difference of geographical conditions and the impact of diverse land uses will create different requirements for the LIS, even though there are many commonalities. Vietnam has 64 provinces and usually, each province requires some special attribution for their LIS⁸. Therefore, to cope with these requirements, proposals have been made to develop two LIS versions at the same time: One to be the standard version (which serves as a National LIS for standard and common requirements) and the other to be a Local LIS (which serves for unique location requirements) [CPLAR, 2000]. It still is an ongoing topic of debate when considering the development of LIS in Vietnam.

It is difficult, if not impossible sometimes, to identify the priority business areas of LIS in a developing country. There are many conflicting pressures with limited resources. LIS is understood as a tool for LA, which includes land use planning, land allocation, land registration, land valuation and other land market activities. Which disciplines or business centres should be the priority for LIS? Should LIS support all these disciplines at once? Some consider that LIS should firstly support land registration for its important role in the issuance of land use rights and land market economics. However, for a developing country, LIS has to work somehow to meet the demands of those other disciplines. Should there be a focus on the environmental factors, education, health or transportation? It is different from the situation of a developed country where the business area would be identified and driven by industry whilst the social and community needs would be driven by political imperatives. This confusion or uncertainty in selecting objectives and business areas of LIS in a developing country is exacerbated by over expectations-many generated by the marketing initiatives of developed countries-of such LIS.

Consequently, the function of LIS in a developing country is also different from a developed country. For a developed country, LIS normally plays a key role in the land market, all aspects of the security of land ownership and the supporting land transactions. For a developing country, LIS is expected to support decision makers for many questions at the early stage of land registration and land allocation⁹. For example, LIS should help to answer questions:

- Where is land available for land allocation in respect of slope criteria for safe production,
- How to make an equitable allocation in aspect of equal quality of land to each land user,
- How LIS supports decision makers in helping the land user.

⁸ Ha Giang for instance has a high priority for pollution from the local paper mills whilst Ba Ria Vung Tau has a major issue of oil pollution in the waterways.

⁹ Actors in the land market of a developed country usually have implicit trust in the supporting mechanisms like the registration process, the legal and surveying professionals and the banking system. Accordingly there is little interest in the actual title documentation since the mortgage system usually ensures that the bank is the repository of the title. This is not the case in developing countries where trust is still to be built and emphasis is on the sight, touch and feel of the certificate which bears the land user's name and the extent of the use right.

To conclude, different scope and the needs of different business areas make copying an LIS difficult and often of dubious value.

4.3 Reason 3: Different Technical Characteristics – A Multi-Faceted System

LIS in a developing country requires having a system working with many interfaces of land or many kinds of information about land. There are many reasons for this view of a multi-faceted system. From an information point of view, there are two reasons:

4.3.1 LIS in a developing country requires many kinds of spatial units

A land parcel is not a unique unit of LIS for a developing country. There are many other kinds of units needed [Fourie, 2000]. Many kinds of spatial units are required by different organisations and multiple systems [Fourie, Paul & Groot, 2002]. Even when considering land registration Larsson, [1996] recognized the concept of many kinds of registration units in developing country. Cadastre 2014 has taken further initiatives in this development of units or rights. This is so true for the case of Vietnam, since beside land parcels, LIS could capture a list of spatial units including a land use plan unit, a management land use unit, a geographical-name land use unit and an administrative unit. Here we only describe a few of them.

- Land use plan unit is defined by land use plan. A land use plan will define where this unit will exist in the future and what land use purpose it will possess. The boundary of this unit does not yet exist in the real world but it is a key condition to do other LA activities. For example, land allocation is only carried out based on the land use plan unit. Land use transfer from this purpose of use to another use has to be based on the existing use of land, which is defined in the land use plan unit. For example, a land transfer of use from rice land to other non-agricultural has to be based on the land use plan unit. If this land use plan unit has the same use of non-agriculture use then this transfer is legal [Article 31, Land Law].
- Management land use unit: It is a piece of land where the purpose of using land is quite clear but the land use rights (ownership) is not yet registered into the registration system because the land parcel is not yet surveyed, or the land allocation decision has not yet made. However, to manage it well, the land office needs to manage the current situation in the system.
- Geographical-name land use unit: Geographic name is a subject of toponymy. This is a piece of land which normally has the same traditional culture, the same purpose of use and might have the same characteristics of cultivation. It always goes with a specific geographical name. Different from a management land use unit, a geographical name is more understandable by local people for this name might have existed for a very long time in history. Just by the geographical name, one can recognize the purpose of use of this land. For example:
 - Xứ đồng X: This area is agricultural land use and has a geographical name X.

- Thôn, xóm, ấp Y: This area is rural residential use and has a geographical name Y.
- Khu, tiểu khu Z: This area is forest use and has a geographical name Z.
The land unit which follows the geographical name is, therefore, also important for the manager of land administration activities.
- Land use for a community group (cộng đồng dân cư): The new Land Law 2003 defines that a community group can register their land. This is not a land parcel with a clear definition of boundary and a clear owner. This is normally land where a community is living, where they have the same rules, traditions and customs of using land. The land user signed on the register will be the head or representative of this community.
- Sub-parcel unit (Thửa phụ). This unit exists in land registration and land survey work. For the Northern region of Vietnam the fragmentation of land is considerable and the area of each land parcel is normally small. Land survey only can make surveying for a group of land parcels instead of an individual land parcel. But the area of each piece of land is still able to be measured. For the land title, the land office uses the diagram of this group of land parcels as a parcel as usual but each parcel (only with total area) is called a sub-parcel and its area will be registered [Trung, 2002]. Figure 2 presents this complex situation.

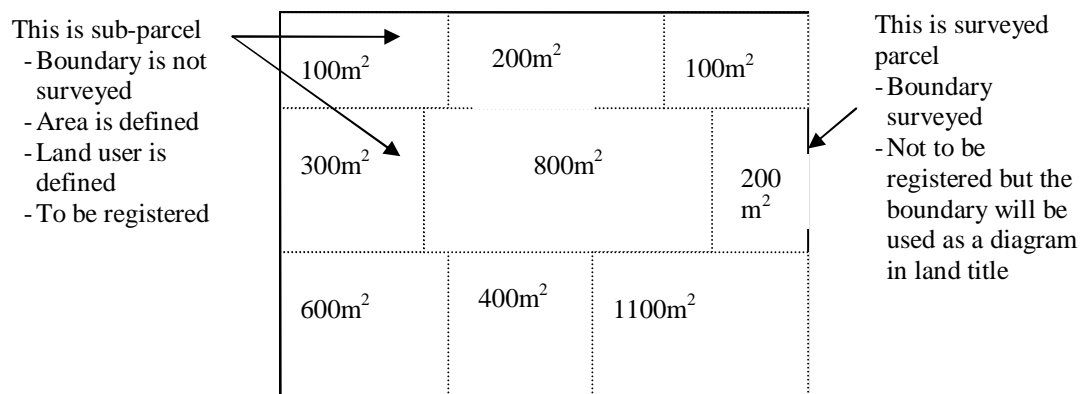


Figure 2: Sub-Parcel and Parcel in Vietnam

4.3.2 LIS in a developing country requires each spatial unit at different spatial and thematic resolutions

Vietnamese LIS has to supply land information to eight different kinds of clients in four administrative management levels, Figure 1. These different kinds of clients and different user demands lead to the land information which is captured and managed in LIS having different quality in both spatial and thematic aspects. [Trung, 2004] has made a user's demand study of this topic and came up with some results of the difference in data used at each of the administrative levels and of each LA activities. There are two examples for different spatial resolutions required for LA and LIS:

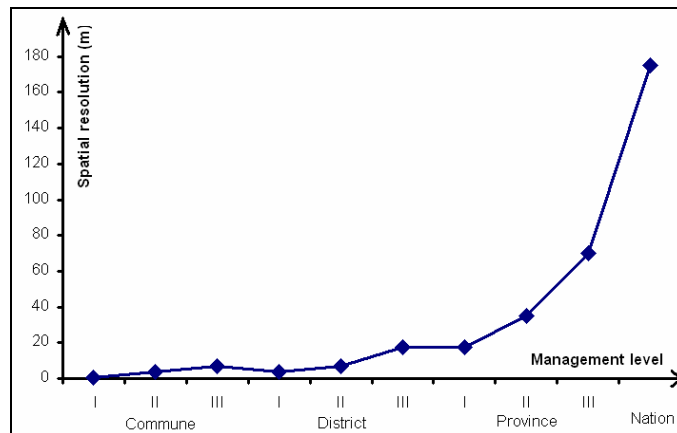


Figure 3: The Difference in Spatial Resolution of Land Information for each Administrative Level

Figure 3 shows that the highest spatial resolution of land use unit is required at communal level and most general at national level. Figure 3 shows a difference of spatial resolution of data used even at the same administrative level. There are three types of Administrative Units I, II, and III for each level. This difference depends on the geographic extent or geographical characteristics of that administrative unit.

On the other hand, Figure 4 shows another example of how different disciplines require a different spatial resolution of data for the same administrative unit. These spatial resolutions for land registration and land allocation are presented in two color lines in Figure 4 where it can be seen that land registration requires spatial data at a higher spatial resolution than land allocation does.

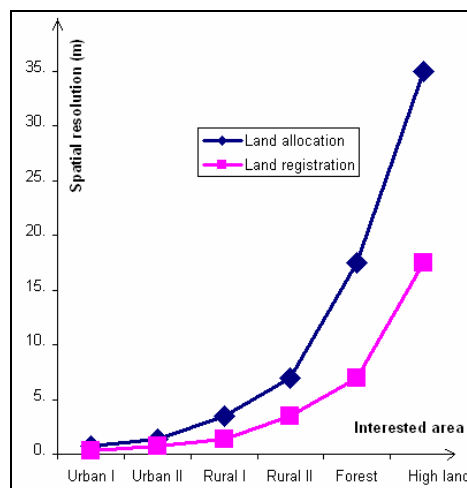


Figure 4: The Difference in Spatial Resolution between Land Allocation and Land Registration in Vietnam LA for each geographical area in Vietnam

To conclude, from the technical point of view, LIS in Vietnam is a multi-faceted system, which contains many kinds of spatial management units at different spatial and thematic resolutions.

5. CONCLUSION

Copying the concept of an LIS is unlikely to be a success as the user demand for LIS in a developing country is different from a developed country. The LIS needs to be designed within existing institutional arrangements but able to mature in the evolving conditions of a developing country.

LA depends heavily on many aspects of a society. The authors of this paper have considered some aspects of the institutional arrangements, legal conditions and user demands of a LIS as they relate to Vietnam. They believe that the distinctive characteristics of this developing country, which create the failure of copying, are identified as:

- LIS in Vietnam requires a multi-faceted (theme and resolution) spatial data infrastructure, which is different from a parcel based system (single-solution) of LIS found in many developed countries. The spatial data infrastructure allows capture, maintenance and use of data for different themes for different management levels of nation, province, district and commune.
- LIS in Vietnam is not only a tool for land registration, land market but also a land policy monitoring system for the next re-adjustment and modification to achieve the societal goals of poverty reduction, environmental protection and sustainable socio-economic development.

A developing country, due to its institutional arrangements and the interplay with a range of social structures, has a greater need to gain a holistic view of the landscape with its economic and social implications. The LIS needs to be designed within existing institutional arrangements but able to mature in the evolving conditions of a developing country. The LIS suitable for developing countries must be capable of providing a sound base for economic and environmental planning¹⁰. Paradoxically developing countries may require a more complex approach to an LIS than the relatively simple use of the parcel based LIS in developed countries.

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¹⁰ This is certainly the theory in developed countries but there is little evidence that it is so in practice.

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BIOGRAPHICAL NOTES

Tran Nhu Trung hold university degrees in Survey & Mapping in Hanoi in 1993 and M.Sc. with distinction in Geoinformatics for Cadastral applications in ITC/The Netherlands in 2000. He also got opportunities to follow several study-visits about land registration, LIS in Malaysia, The Netherlands, Germany, and Sweden.

Trung started to work for General Department of Land Administration in 1993. But now, he is working for two consultancy companies dealing with natural resources and environment: TECOS and VNGEO in Vietnam. He has followed many kinds of projects dealing with land administration, survey & mapping, NSDI, remote sensing, integrated coastal zone management, and environment protection. At present, he is team leader of a research for relationship between poverty and land law 2003 in Vietnam funded by World Bank, and he also plays as E/LIS national consultant for the Strengthening Environmental Management

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Dr. Don Grant was, until 2000, the Surveyor-General of New South Wales, President of the Board of Surveyors, Chairman of the Public Sector Mapping Agencies, Australia and Chairman of the Geographical Names Board. He is a Registered Surveyor, a Licensed Land Broker and holds a Masters of Environmental Studies from the Adelaide University. He is a Fellow of the Royal Institution of Chartered Surveyors UK, the Institution of Surveyors, Australia and the Australian Institute of Company Directors. In May 1997 he was made a Doctor of Applied Science, *honoris causa* at Charles Sturt University and a Doctor of Science, *honoris causa* at the University of New South Wales and in 2004 a Doctor of Surveying, *honoris causa* at the University of Melbourne.

Don was appointed as a Member of the Order of Australia in the 1994 Queen's Honours List. In 1998 he was awarded the Mapping Sciences Institute, Australia, Gold Medal and the AURISA Eminent Individual Award.

Don has worked in most States of Australia, in the public and private sectors and the defence forces, serving as a regular and reserve officer in Australia and abroad reaching the rank of Lieutenant Colonel in the Royal Australian Engineers. He has consulted or advised in the Sultanate of Brunei, the Maritime Provinces of Canada, the Commonwealth of the Bahamas, Republic of the Philippines, Sri Lanka, Hong Kong, Indonesia, Thailand, Malaysia, Zimbabwe, Pakistan, Poland, Vietnam and the Peoples Republic of China. He concluded a period as the Chief Technical Adviser to the Hellenic Cadastre in Greece in 2002 and is currently the Chief Technical Adviser to the SEMLA in Vietnam.

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