Cadastral Systems in Jakarta: Building the Spirit of the Road to a Spatial Data Infrastructure

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Key words: SDI, cadastre, BPN, LOC

SUMMARY

The Spirit of the road towards the development of an SDI (Spatial Data Infrastructure) is now under construction, performed by cadastral systems in Land Offices all over the city of Jakarta, through the exercise of the Land Office Computerization (LOC) Project. The exercise deals with efforts to strengthen institutional arrangements for good governance; to reform law and regulation frameworks for sustainable development; to develop technical standards and specifications of cadastral systems for future SDI; to enhance human resources development for mastering challenges. It is hoped that the paper achieves its objectives of presenting a wide range of experiences from the West Jakarta and Central Jakarta Land Offices, the two locations of pilot project, to make a contribution for the development of an SDI in the years ahead.

The implementation of an IT in modernizing cadastral systems like in the case of the LOC project requires many resources. In this manner, the brain ware of the project is the Hamburger model, which builds the spirit of the road towards the development of modern cadastral systems and at the same time the basis for further development of an SDI. The benefits of the LOC project are numerous ranging from institutional up to human being. The completeness datasets sustain the decision making process and the request by the courts in a case of land disputes. The level of self-confidence of the staff members lifts up as their skill and knowledge increase. As a result, the BPN members of staff intensify the workplace character more professional, and the place of work acclimatizes with modern climates that full of pride, and better quality of public services.

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1. INTRODUCTION

The city of Jakarta, as the prime gateway to Indonesia, the center of government, business, and industry, spreads over an area of more than 650 square kilometers (1410 square miles) and has a population of more than ten million people. Geographical position of Jakarta is on the northwestern coast of Java, from latitude 6' to 7' south and 107' to 108' east. In terms of size, Jakarta covers a land area of 650.40 square kilometers. For administrative purposes, Jakarta consists of 5 jurisdictions: Central Jakarta (54.89 sq. km.), West Jakarta (131.41 sq. km.), North Jakarta (136.96 sq. km.), East Jakarta (182.01 sq. km.), and South Jakarta (145.13 sq. km.).

Followings these five jurisdictions in Jakarta, BPN, stands for Badan Pertanahan Nasional or National Land Agency, manages cadastral systems which consist of Land Registration and Cadastral Survey in five Land Offices and a provincial office. Comparing to more than 300 Land Offices throughout Indonesia, the 5 Land Offices in Jakarta are largely the most comprehensive in terms of cadastral challenges. Unlike in countries where authority of Land Registration and Cadastral Survey are in different institutions, BPN undertakes these two together within one organization managed under the Deputy for Land Information.

The city, as diverse as the country, is one of the largest cities in the world, due to its rapid growth in economic development that triggers a fast growing population. Overflow of migrants has flocked to the city on the lookout for better source of revenue, due to the 70 percent higher per capita income in Jakarta than the national average in the whole. In several years ahead, a population in Jakarta would be more or less 15 times its size in 1950. This figure indicates the rapid and increase demand to the immediate land availability for the people living space, that in turn, indicates how the degree of cadastral complicatedness in the region is getting excessive periodically.

The paper presents some cadastral issues relating to socio-economic manifestation and efforts undertaken by BPN in strengthening institutional arrangements for supporting good governance, reforming land law and regulation frameworks for sustainable development, developing technical standards and specifications of cadastral systems for the future SDI (Spatial Data Infrastructure) and enhancing human resources development. The paper also highlights experiences from the Land Offices of the West and Central Jakarta, the two locations of LOC pilot projects, in promoting the integration of spatial data management into daily workflow of the public services. The integration would be a well-built foundation for the development of an SDI in the years ahead.

2. CADASTRAL ISSUES IN JAKARTA

Socio-economic issues encircle cadastral development in Jakarta are prominent. The performance of cadastral systems in Jakarta has some bearing on the population growth, due to the demand where cadastral systems have to provide a continuously better public service. The metropolitan region has significantly increased from time to time. As the case, which occurs mostly with mega cities, Jakarta's urban fringe is growing much faster than the city itself. Most of this expansion is due to population pressures where land in the central city is expensive and densely occupied, so newcomers must settle on the suburbs. If more appropriate cadastral services are not examined from time to time while the urban sprawl continues, the city will undoubtedly be faced with higher infrastructure costs and worse socio-economic issues in the future development.

One of the major obstacle is related to people misinterpretation concerning ex colonial and ex customary land rights, where actually have been converted into authorized land rights since 1960 the year of enactment of the BAL or Basic Agrarian Law. The misinterpretation frequently leads to the conflicts over parcels of land that need the court processes. It is recognized that the starting point of modern Indonesian cadastral systems is 24th September 1960 when Government enacted the Law number 5 of the year 1960 which also called the BAL or *Undang-Undang Pokok Agraria* (UUPA).

In the face of the word “Agrarian” in the heading, the BAL jurisdictions are in not only the area of land, but also water area and natural wealth. This means that cadastral systems in Indonesia not only deal with land as a center of attention, but also water area. Therefore, marine cadastre has exclusive prospective needs to be immediately developed. It certainly is a grand challenge for Jakarta since the northern part of the city is surrounded by small islands with their potential for tourism destination and fisheries.

Prior to the enactment of the BAL, numerous colonial Decrees, Ordinances and the Civil Code regulated land administration for land which in possession of non indigenous people, leaving unwritten customary law regulated land rights owned by indigenous people. Since the enactment of the BAL, previous written regulations had been revoked on a national scale. Based on the BAL, Government then enacted the Government Regulation number 10 of the year 1961, which was revised by the Government Regulation number 24 of the year 1997.

These were a series of cadastral reformation exercised by BPN. Since then, Jakarta has been experiencing great efforts to cope with the difficulties in converting old form of land rights into up to date land rights. The implementation of the conversion is uneasy and faced with many difference of opinion concerning old documentation. One of the critical challenges of sustainable development in Jakarta is how to fit such an implementation into the efforts to release from the frameworks and achievements of the past. Many land disputes in Jakarta, for the most part is the struggle with colonially expired system of land titles. In fact, this situation and the growth of land markets are not disconnected.

In principle, controlled and equitable land markets are critical underpinning for state-of-the-art of economic development, since they have rapid and sophisticated capacity for changes in land use, allow sound land transactions, and put in order economic assets through collateral arrangements. In this position, an appropriate cadastral system has a potential role in facilitating such land markets. Nonetheless, there is a tendency to fraudulently make or alter a written document relating to a piece of land that affects the legal liability of another party. Such of a tendency is harmful impacts of the rapid development in the urban areas like Jakarta that is considered as a criminal. This crime of forgery typically relates to ex-colonial titles or ex-customary land.

Even though a series of remedial efforts have been put on for the last decades, the challenges in the implementation of cadastral systems in Jakarta are still excessive, as land related tensions remain intact. Land disputes due to the escalation of urban development are still on the way exhausting to work out. By learning this environment, the augmented cadastral systems are definitely required to have an appropriate capacity to respond the present and future challenges.

Over the last two decades, there have been stronger government commitments to improve land management and administration including cadastral systems. BPN puts more remedial efforts in continuing further cadastral renewal. Furthermore, it is also expectable that BPN establishes a new paradigm through the enactment of revised BAL and revised Government Regulation number 24 of the year 1997 that would eventually be endorsed. Many issues augment the renewal on cadastral systems internally and externally. One of them is the latest issue of the development of an SDI.

3. SPIRIT OF THE ROAD

In strengthening sustainable development of cadastral systems, the Government formulates a great endeavor based on the Decree of the House Representatives number IX/MPR/2001 regarding the Agrarian Renewal and Natural Resources Management, and the Decision of the President number 34 of the year 2003 regarding the National Policy on Land Issues. The central of these two is the development of a National Land Management and Information System (NLMIS). This means that cadastral systems gain more attention and BPN has an officially authority to build the spirit of the road towards the development of an SDI in local and national levels.

The key driver to build an NLMIS in Jakarta Land Offices is the ready availability of the base of spatial datasets produced by the Land and Mapping Agency of the city of Jakarta *(Dinas Pemetaan dan Pertanahan : DPP).* All institutions within the city of Jakarta are authorized to utilize the DPP spatial data sets as stated in the Governor Instruction number 32 year 2004. Based on this dataset, BPN integrates all other datasets and administers public services spatially. Accordingly, the function of an SDI is considerable as the augmentation key, since an SDI underpins the correlation of human being as a subject of title and a parcel of land as an object of title, through deliverance of the uniquely site ingredient in the format of spatial information.

BPN endeavors to introduce a new mindset required for further sustainable development in Land Offices all over the country including Jakarta Land Offices, namely the administering the public services environment spatially. Consequently, Land Offices put the last touches on the isolated exercises on spatial information technology, and subsequently integrate spatial data management into workflow of public services.

The initial endeavor has started since 1997 by launching the phase 1 of the LOC project and continued to the phase 2A in 1999, implemented in a total of 14 Provincial Offices and 38 Land Offices all over the country of Indonesia. Now, LOC Project steps forward to phase 2B involving all Jakarta Land Offices and its Provincial Office. During this phase, remodeling is totally applied, namely to integrate spatial data management into day-to-day workflow of public services based on the model introduced by the Central Office of BPN called *Hamburger* (see Figure 1).

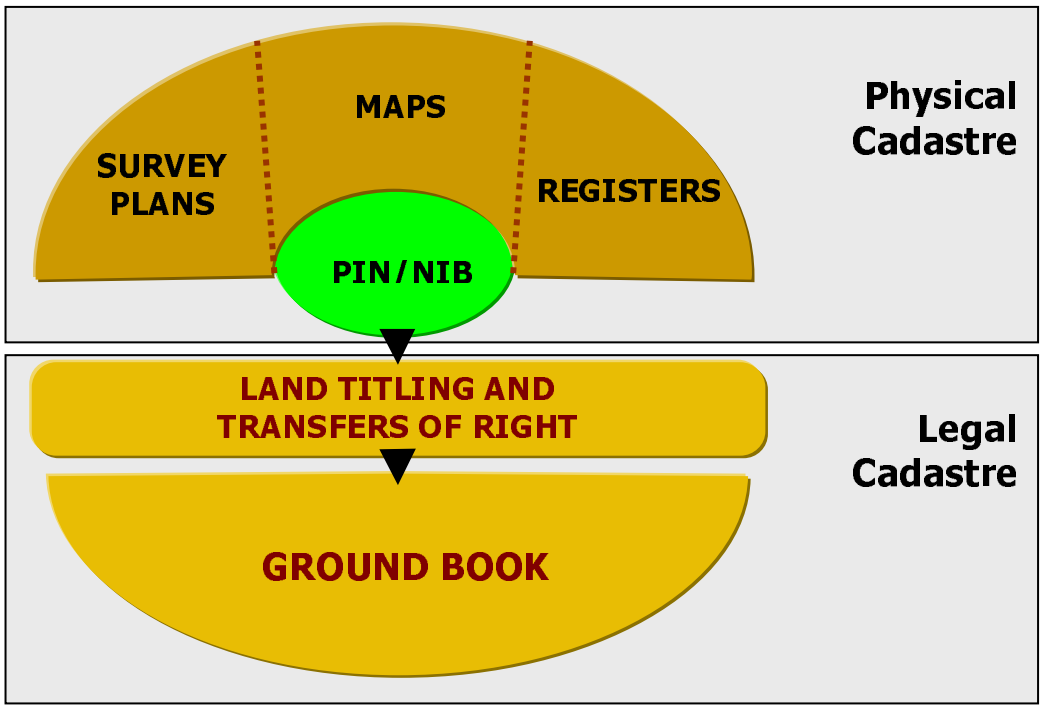

Figure 1: Hamburger Model

The concept looks at the point of intersection of IT and BPN enterprise strategy, which shows how an enterprise in fact functions in the new electronic capacity. Infrastructure, enabling technologies and applications deliver BPN enterprise solutions. The Hamburger model develops technical standards and specifications of cadastral systems for future SDI development.

The Hamburger model defines the survey-plans, maps and registers into a physical cadastre which deals with the management of spatial data. The model also defines the ground book as a basis of land titling and transfers of right into a legal cadastre, which deal with management of juridical aspect of public services on land.

The Hamburger model sets up spatial modeling using spatial dataset from the *DPP*, which is practicable in delivering public services spatially. A unique Parcel Identifier Number or PIN called NIB stands for *Nomor Identifikasi Bidang* numbers each land parcel and links up spatial and textual information gained from survey, mapping and land register.

The NIB consists of 13 digits with the first two digits represent provincial code and subsequently downgraded every two digits represent municipality, district and village codes, while the last five digits represent land numbering. The NIB also connects the information with legal information gained from the process of land registration.

The impacts of introducing the Hamburger model are huge. It requires a range of adjustments in simplifying the current procedures of land registration. The fundamental laws concerning cadastral systems: the Law number 5 of the year 1960 and the Government Regulation number 24 of the year 1997 and other subordinate regulations are revised. BPN establishes an extensive strategy in putting an NIB on parcels of land throughout the country. The Hamburger model is the engine or the brain ware for the implementation of an IT to modernize cadastral systems in Indonesia.

The implementation of an IT in BPN has a special history. From 1988 up to 1998, the Government formed BPN to upgrade its predecessor institution. This decade was the first phase of effort to reform Jakarta cadastral profile through the implementation of new legal approach, the empowering of human resources development and the development of more appropriate infrastructures. As a result, a significant increase in a number of issued certificates of title comparing with the period of 28 years prior to BPN reached almost triple. In the course of this phase, the utilizing of IT was in effect although still in isolating approach.

The second phase from 1999 up to now implements IT into more integrated approach. During this phase, the thrust of cadastral reform has been more clients oriented, on a basis of building partnerships with all stakeholders on the adjudication program of systematic registration. As a result, the amount of issued certificates of title has been double comparing to the previous phase. Moreover, comparing to the average amount of certificates issued by all Land Offices throughout Indonesia, the achievement in Jakarta Land Offices is more than twice. The figure gives a clear picture on how cadastral reform fit into the stakeholders needs, and represents adequate partnerships amongst stakeholders in performing sustainable development. This is corresponding to the 2002 Earth Summit theme in building partnerships for sustainable development.

BPN builds partnerships with other stakeholders to perform increased land related services to the clients by installing the concepts of e-government, e-commerce and e-payment in the near future. Amongst the partnerships, there are two, which continuously built, related to the cadastral survey and mapping and to the conveyancing and mortgages activities. The first is built with Licensed Surveyors and the second with public officer called PPAT stands for *Pejabat Pembuat Akta Tanah*: a conveyancer, a public officer who specializes in issuing deeds related to land transactions.

Partnership built with Licensed Surveyors is primarily in providing spatial information through either systematic or sporadic program of land registration. The partnership undertakes systematic program through adjudication projects every fiscal year. In the partnerships, the Licensed Surveyor acts as a spatial-information provider, while PPAT acts as a transaction-information provider for BPN.

PPATs provide information related to transactions on land, such as conveyancing and mortgage based on the Government Regulation number 37 of the year 1998. In acting as a transaction-information provider, PPATs prepare all the necessary documents and investigate the title in connection with the creation and assurance of interests in land. This is similar to a solicitor or a licensed conveyancer who examines title, prepares deeds and mortgages.

It is compulsory for PPATs to register their deeds in the Land Office within their jurisdiction. Their deeds are legal resources for the Land Office in registering the conveyancing or mortgage and issuing certificates of title. PPAT deeds are one of the inputting data to be integrated into cadastral datasets that turn into economic growth indicators for urban development.

The deeds are also one of the indicators for the taxation intensification, since it is compulsory for PPAT to issue their respective deeds on land following the payment of taxes by the related taxpayers: BPHTB and PPH. BPHTB *(Bea Perolehan Hak atas Tanah dan Bangunan)* is a kind of tax levied on the owner of land and building that usually measured in Jakarta as 5 %, of the land and building pr(ice minus 60 million rupiahs. PPH *(Pajak Penghasilan)* is a tax imposed on the sale of land and usually measured as 5 % of the purchasing price.

In Jakarta, these taxes together with the Land and Building Tax make a significant contribution around 40 % to the revenue for financing sustainable development. The figure of 40 % is one of the leading revenues in the city. This is one of the benefits of the cadastral systems implemented through the concept of building partnership amongst stakeholders. The taxation administration system is undertaken by the Ministry of Finance and could be distinguished as a fiscal cadastre.

The partnership built between BPN and the Ministry of Finance, to collaborate juridical and fiscal cadastral systems, has been in a more progressive of data exchanges and information integration. Many thoughts are discussed to make these cadastral systems more powerful to sustain socio-economic development.

In order to continue building partnerships with stakeholders and in considering the significant growth of socio-economic development in Jakarta, BPN attempts to improve extensively public services related to land by performing the LOC project phase 2B. Therefore, BPN chooses two locations of Land Offices in Jakarta to undertake pilot project: the West and Central Jakarta. BPN carries out LOC project through partnership with the Government of the Kingdom of Spain.

4. TWO PILOT PROJECTS

According to the BPN Jakarta data until middle July 2004, the amount of titled land in Jakarta is 995,074 parcels of land, while other 548,693 parcels of land is ready for titling. The amount of titled land in Central Jakarta is the highest amongst five jurisdictions namely 73.6 %, while in West Jakarta is 61.8 %. The others are 72.8 % for North, 71.0 % for South and the lowest 51.8 % for East. The three are the topmost due to their historical background and economic developments, while East is a mixture of rural-urban area.

The two locations: West and Central Jakarta Land Offices encompass the most difficult problems related to the public services in terms of social, economic and environment. The project objectives are examined during the pilot project, namely to strengthen institutional building of BPN, to improve accuracy of cadastral datasets, to enhance cadastral services to the public and to empower human resources development. Following the final changes of the model, the implementation into other three Land Offices in Jakarta and all Land Offices in Indonesia would be extensive as an additional to the current systems installed in the BPN Central and Provincial Offices (See Figure 2).

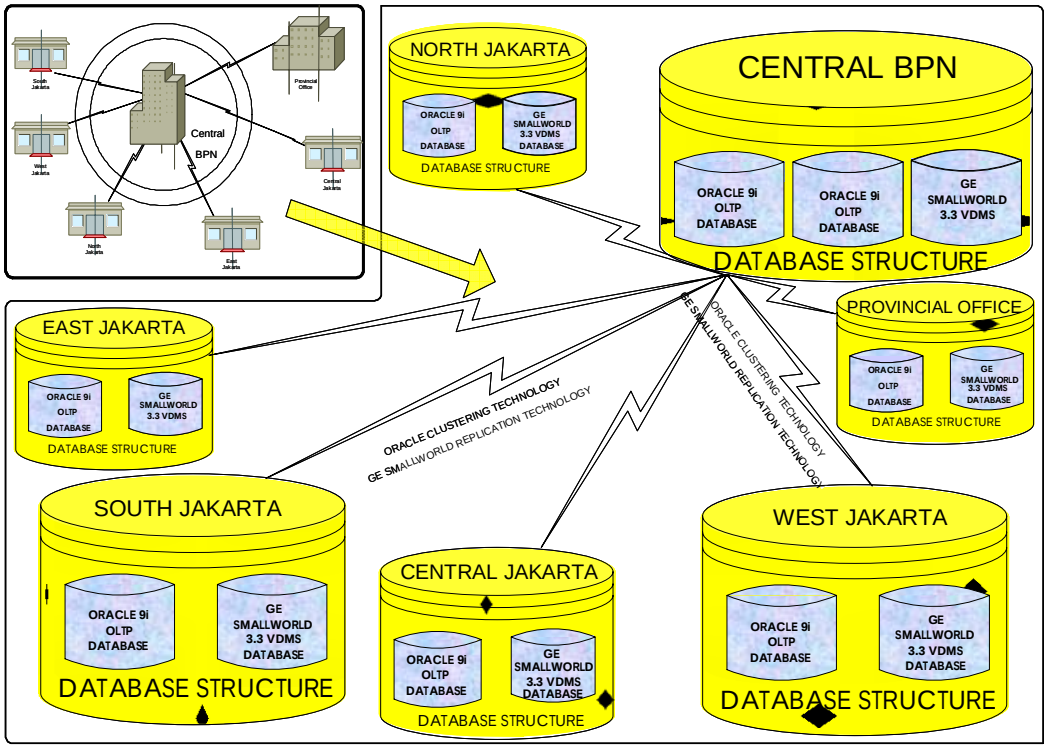

Figure 2: Database Physical Architecture

The cadastral model delivered by LOC would be entirely approachable to the dynamic atmosphere of land related issues. Therefore, LOC exercises a client server system with open architecture. Operating system on the database server uses The RedHat Enterprise LINUX AS 2. Operating system on the database and application server uses the Microsoft Windows 2000 Advanced Server.

Windows-based operating system for clients uses Microsoft Windows XP Professional. Relational Database Management System uses Oracle 9i, Oracle JDeveloper Suite and TransTOOLs J-Cosmos. Development Tool uses Microsoft Visual Studio Net Pro 2003. Case Tool uses Sybase Power Designer. GIS S/W uses GE Smallworld and Safe Software Feature Manipulation Engine. CAD Tool uses AutoDesk AutoCAD LT, Autodesk Map 2004 and Able Software R2V.

The pilot projects apply the concept of the *Hamburger* in connecting the physical cadastre with legal cadastre by using PIN/NIB. In this case, spatial information of land parcel is linked with its related textual information. Figure 3 presents such land related information, which consists of five kinds of information: physical, juridical, usage, strata title and transaction on land. The presented parcel of land is located in the Central of Jakarta.

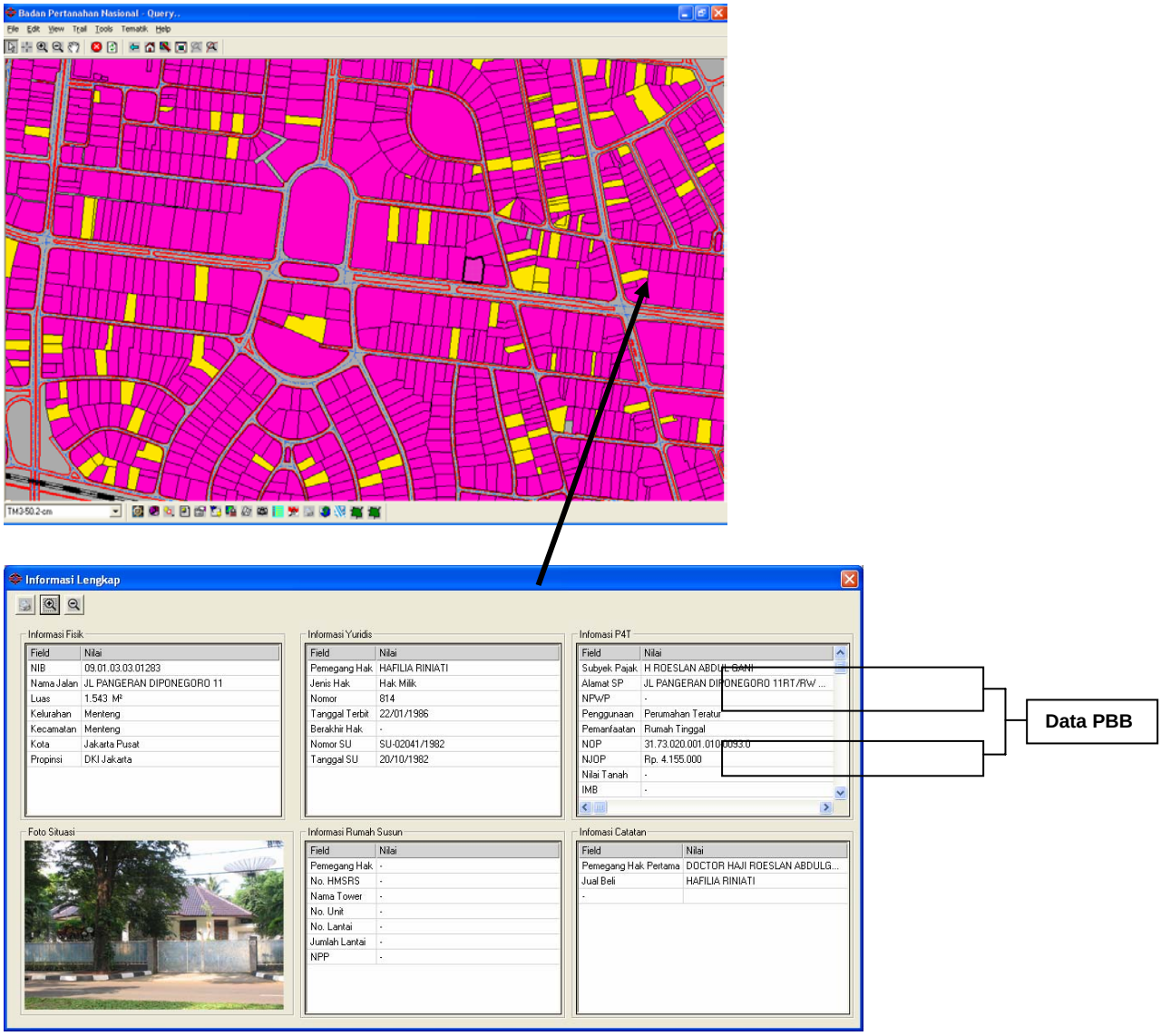

Figure 3: Land Related Information

Apart of the technical results and institutional building, the pilot project encourages BPN members of staff to increase their skill and knowledge on IT through special training provided by project management. A series of in-house training and others are set up in the BPN Central, Provincial and Land Office levels, in order to build the empowering of human resources on cadastral systems in these two pilot project locations.

The benefits of the LOC project are numerous ranging from institutional up to human being. The completeness datasets sustain the decision making process and the request by the courts in a case of land disputes. The level of self-confidence of the staff members lifts up as their skill and knowledge increase. As a result, the BPN members of staff intensify the workplace character more professional, and the place of work acclimatizes with modern climates that full of pride, and better quality of public services.

5. CONCLUSION

The implementation of an IT in modernizing cadastral systems like in the case of the LOC project requires many resources. In this manner, the brain ware of the project is the Hamburger model, which builds the spirit of the road towards the development of modern cadastral systems and at the same time the basis for further development of an SDI.

The building partnerships amongst stakeholders are one of the most important things to set up in performing sustainable development. This is considered as the remarkable efforts of precious networking required in the millennium. Apart of the benefits, the partnerships to built modern cadastral systems recognize with awareness the value of socio-economic environment of the country.

The paper expects the efforts undertaken by BPN in Indonesia would be a worthwhile contribution to the cadastral science world, in particularly for modernizing cadastral systems towards the development of an SDI in the years ahead. Aamiin.

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