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# URBAN AND PERI-URBAN LAND MANAGEMENT EXAMPLES FROM PROVINCIAL CAMBODIAN CITIES

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## INTRODUCTION

While Cambodia is still primarily a rural country, it is changing fast and urbanization is exceptionally rapid over the last years. With an annual growth of urban population by 8.4% according to the ADB the rate is probably among the highest rates in the world. This high rate primarily results of permanent large-scale migration from rural areas into Phnom Penh as well as some secondary towns, since the Paris Peace Agreement of 1991. Since 1970 due to three decades of civil unrest and war individual ownership of land was banned, cities emptied and people were forced to live in communes that engaged massive irrigation projects in rural areas. Nowadays the escalating growth in urban population has led to accelerating deficiencies in urban infrastructure and efficient planning for urban services and development concepts. As a historical consequence, today land use planning and urban land management are among the most pressing development issues in Cambodia. Based on regional land assessment and local development plans, this paper presents conceptual as well as technical approaches to effective participatory land use planning in two Cambodian cities (Kampong Speu and Battambang).

According to the 2004 inter-censal population survey, the urban population in Cambodia is about 1.9 million of which 58% live in the capital, and dominant city, Phnom Penh (NIS 2004). Despite high urbanization rates, the current level of urbanization is still very low. About 17% of Cambodians are living in urban areas and Cambodia's level of urbanization is expected to increase to 24% of its population in 2015, when the urban population is forecast to total four million people (NIS). About 20 percent of the urban population in Cambodia is squatters. The lack of basic urban infrastructure and land tenure are the most threatening issues. Squatter settlements have traditionally been considered illegal and families denied tenure and access to most basic services. The flattening of land records in the past also contributes to poor families being particularly vulnerable.

Although Phnom Penh dominates the urban system, secondary intermediate sized provincial cities, such as Kampong Som (Sihanoukville port; manufacturing and tourism potential), Battambang (agri-business), and Siem Reap (tourism at Angkor Wat) are economically viable

and have potential to become stronger development poles in the future. Even minor towns like Kampong Speu (Provincial Centre at the outskirts of Phnom Penh) and Koh Kong (fishery port, industrial estate zone and new tourist destination) will gain further potential for some urban growth.

In Cambodia, urban and urbanization area generally is defined as an area which urbanized or should be urbanized within ten years. Building and construction activities are encouraged based on the land use plans to be developed. However, current Cambodian law does not define the precise building types or general use of the building permitted by the land use classification. Complete regulations or urban land use authorization exists only for some individual types of buildings like elevated buildings. In fact there are still many other official and informal regulations to control urban land use in Cambodia.

Historically, in Cambodia 'planning' was - and often still is - carried out by technical staff at national level through preparation of 'Master Plans' that were subsequently handed down to the local level for further implementation. Top-down and technically oriented planning approaches by itself are unable to respond adequately to rapid changes and local issues that occur in rapidly developing urban centres. Consequently, new ways of thinking and appropriate tools should be used to support spatial planning and implemented at the local decision level. This includes innovative approaches for involving the local level in managing its own urban affairs and contributing to the overall development.

### **Urban and regional planning structures in Cambodia**

According to Sachs (2003) effective urbanization has three distinct policy dimensions: urban planning, urban development strategy, and urban governance. The first of the policy dimensions is urban planning. The failure of communist centralized planned processes has made "planning" a taboo word in developing economics during the last 20 years. However, it is incorrect to conclude that all planning contradicts with to economic development. This aspect of successful urbanization is the need for appropriate urban-level governance. There are differentiated and complementary roles of governments at the local, regional, and national levels, but there is no doubt that effective urban governance requires enough autonomy and decentralization so that local government can provide the necessary tailored infrastructure and development strategies.

The Ministry of Land Management, Urban Planning and Construction (MLMUPC) is responsible for urban and regional planning in Cambodia. In 1994, the national government established a National Committee for Regional and Urban Development and Construction (NCRUDC), with power to establish bureaus of urban affairs in each urban centre. However, these urban bureaus have had virtually no success, given the existence of simple line agencies operating in urban areas that implement programming set out in Phnom Penh. The urban bureaus appear to offer little potential to coordinate future urban development.

While there are severe limitations in spatial planning capacity at all administrative levels, MLMUPC tries to improve skills and knowledge of its staffs. There is a shortage of virtually all technical skills; a product of the country's history. Institutional development of responsible ministries is under reconstruction but still remains inappropriate to perform adequate services. In example, there is no urban housing policy or formal housing finance

programs. Urban land use planning is lacking technical as well as methodological capacity. The Governance in Cambodia remains even now centralized, in contrast to other South East Asian countries, although small steps were taken already. Since the year 2000 capacity building on national, provincial and district level takes place with support of different international organizations. Urban planning and land management in Cambodia are still confronted with a variety of challenges in urban and rural areas (Symann 2005) i.e.:

- Uncertain legal framework and responsibilities in spatial planning, urban planning and land management
- Indistinct state land and private state land property
- Uncontrolled grabbing of land and land conflicts in peri-urban areas
- Steadily rising Rural-urban migration
- Rapid urban population growth in Phnom Penh and in a few provincial cities
- Uncontrolled settlement development and construction activities without adequate infrastructure Large scale development activities along road corridors and national borders which are hardly balanced
- Exceeded unsustainable use of natural resources and infrastructure

Due to the lack of an efficient urban master plan process, zoning concepts are not well known yet and conceptions for particular development axis are still very poor. In this regard that the Royal Government of Cambodia (RGC, Ministry of Land Management Urban planning and Construction MLMUPC), has recognized a great need for decentralized integrated planning for economical and infrastructural development as well as conceptual framework to improve regional efforts on urban planning processes. A short-term emphasis is on introducing a more consultative approach where problems and issues as defined by the local level are gathered and considered as part of the planning process. Provincial and district staff in collaboration with advisors enhance and increase than the capacity building process in land use management and urban planning as well as regional development issues. The example of Kampong Speu urban planning process is particular about the demarcation of urban green space between urbanization area and urbanization control area. Another example from Battambang introduces a technical development process that led to an urban management plan and the measurement of urban growth. The overall objective is to improve planning and mapping capacities in decentralized provincial and district administration via several technical GIS and remote sensing techniques, staff training hand on advice. For realistic and participatory planning and implementation processes a reliable spatial information database at district and provincial level, containing up to date aerial photos is essential resource for the planning process.

German development cooperation (DED, CIM, gtz, KAS) supports the Cambodian Ministry of Land Management and Urban Planning with technical assistance. Advisors boost and increase the capacity building process in Land management, urban and regional as well as land use planning issues. In particular, this collaborative group of German development agencies and foundations supports the urban and regional planning process in two provincial Cambodian cities, Battambang and Kampong Speu and their adjacent districts. The Battambang project works under the umbrella of the ASIA URBS project since 2001 (Fig. 1).

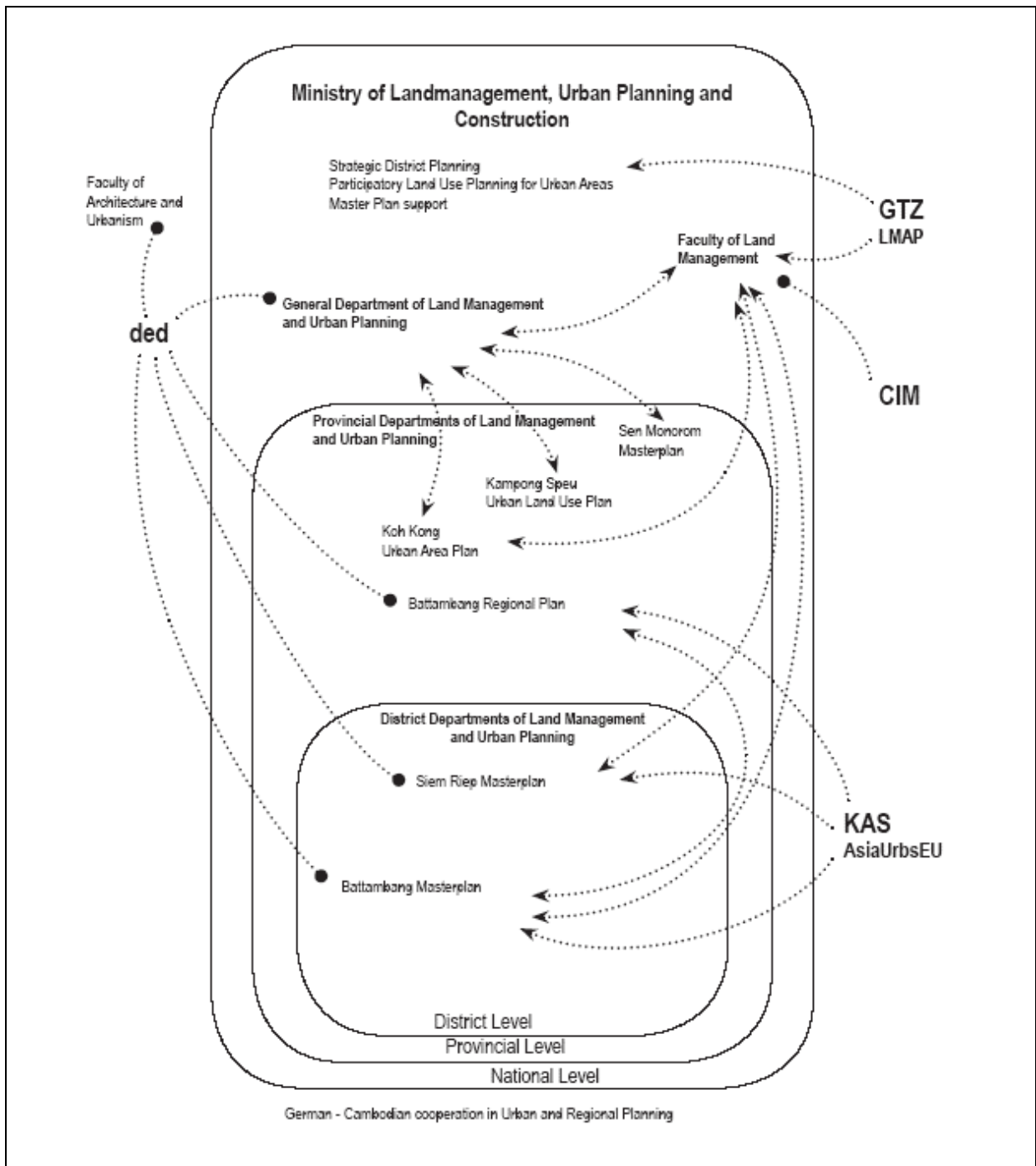


Figure 1: German-Cambodian Cooperation in the Urban and Regional Planning sector (Symann 2005)

### Balloon Aerial Photo technique

To support the decentralized efforts, resources and technique is needed on the local level. The balloon aerial photo technique is an inexpensive example to be used on the local level. The background of this technical attempt is to provide recent aerial photos on a high pixel resolution while orthophotos are not everywhere available in Cambodia. Other high

resolution images from scanners like as Quickbird, Ikonos a.o are most likely unaffordable due to insufficient decentralized budget for urban planning purposes. As a consequence topographical and other spatial data is more or less missing in provincial and district planning offices and improvement and modifications are mainly not easy to integrate into smaller scaled planning resources.

Amateur aerial balloon photos from a non calibrated digital camera (Olympus C-60 or C-70) provide a low-cost but quality efficient alternative for the production of high-resolution aerial colour photos of the planning region (Fig. 2). This technique is currently available in Cambodia via a private geo-spatial company the Phnom Penh Geoinformatics Education Centre (PGEC). The rectified merged and geo-referenced aerial balloon-photos with pixel accuracy below 1m of resolution proved to be an excellent and low cost option to receive the most recent spatial data for urban areas with rapid land use changes (Fig.3). Besides, they are expected to be useful for other “small area” projects like village based land use planning or (eco-) tourism projects at specific locations and retakes of the same photos within a high-level time resolution of one or two years.



Figure 2: Digital aerial balloon photo technique

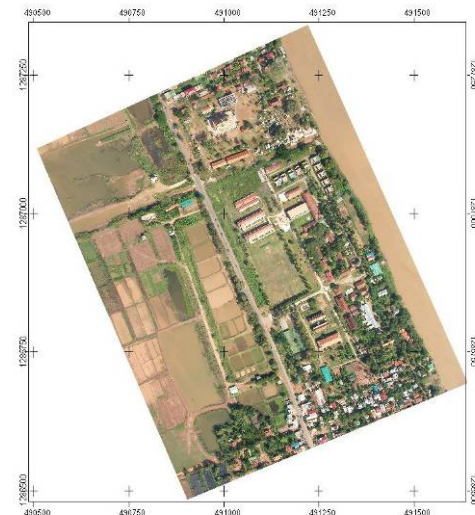


Figure 3: Geo-referenced aerial balloon photo map of the outskirts of Phnom Penh

This amateur solution based on a simple plastic balloon ( $r=3m$ ), inflated with hydrogen gas produced on the site now makes aerial photos available with a price 0,10-0,35 US cents per hectare. The surface resolution per pixel varies among 20m to 0.4m depending on altitude of the platform, clouds and camera capacity. They are enlargeable up to a scale of 1:1.000 without any loss in optical and spatial quality. Methodologically the approach uses typical image processing, enhancement and geo-referencing techniques like haze elimination, merging and mosaic procedures, mostly provided by ERDAS IMAGINE software (Fig. 5) The picture collection as well follows standard aerial photos measures like flight line preparation, synchronisation of camera and GPS clocks as well as ground trust sample. Further processing steps are image rectification and geo-referencing of single or merge pictures to either topographic maps or to other remote sensing images like SPOT IMAGE orthophoto products.

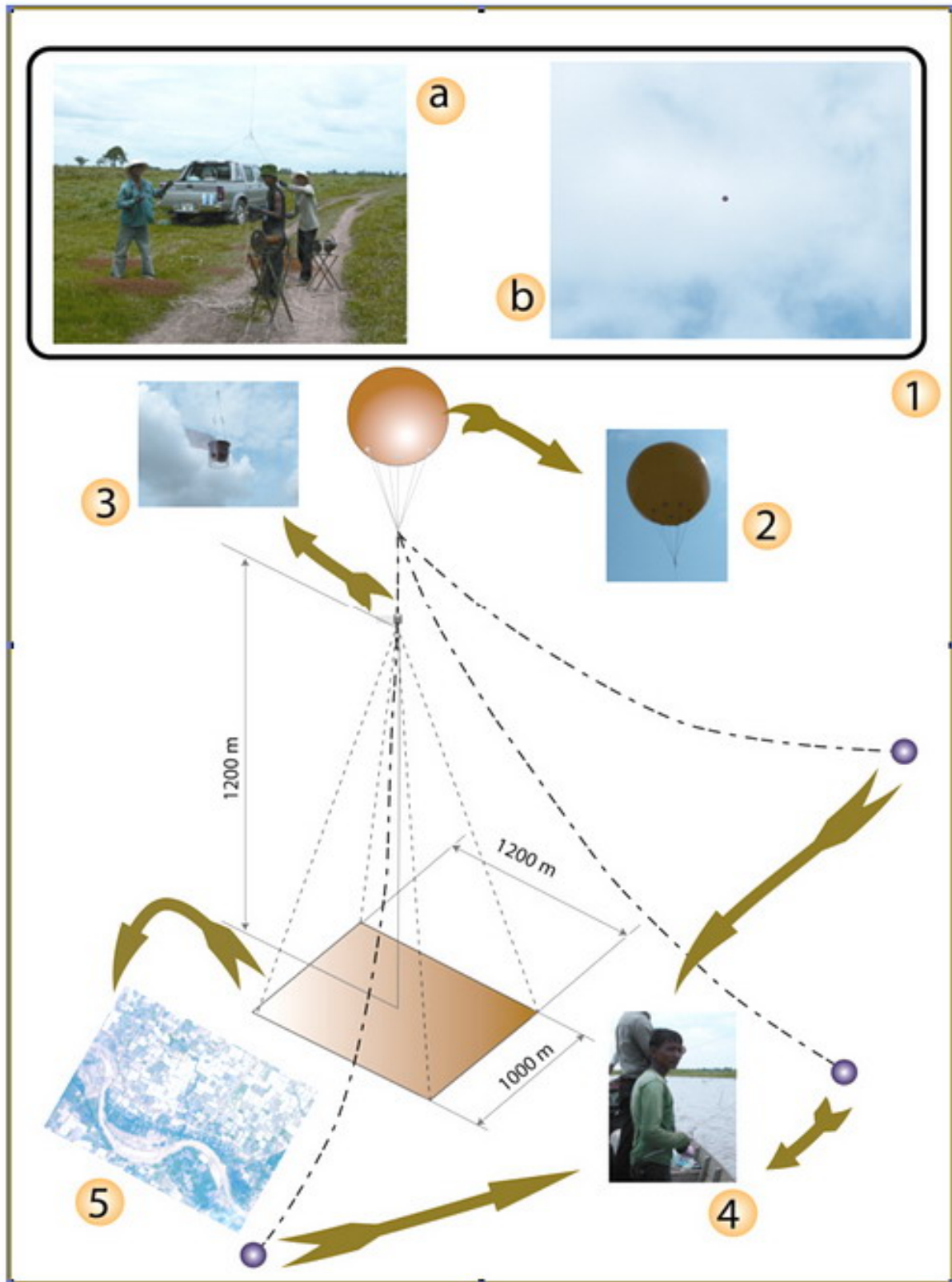


Figure 4: Aerial Balloon Photo receiving methodology

## Urban development examples of three Provincial Centres

In 2004, the first planning process using the amateur aerial balloon photo technique has been started in Kompong Speu, a provincial town 40 km southwest of Phnom Penh. The regional and district planning officers worked on different planning scales from regional planning to urban design. In both town centres the official aerial photo available with the ministry was outdated (aerial photo 1992) because rapid uncontrolled land use changes had already transformed the fast growing urban environment. Around 50 aerial balloon photos of both towns were ordered in 2004 to provide a good planning resource on 1: 1.000 – 1: 5.000 mapping scale. The global objective is to improve planning and mapping capacities in decentralized provincial and district administration via several technical trainings and on hand advise. For a realistic planning and implementation process a consistent spatial information resource is essential.

### **Battambang**

Battambang a provincial town 300 km northwest of Phnom Penh, as the second biggest Cambodian town is growing fast and construction take place all over the district area - partly uncontrolled. In September 2004 the Phnom Penh Geoinformatics Education Centre (PGEC) has taken balloon aerial photos of the urban centre and outskirts of Battambang District (Fig 5). These pictures give detailed overview of existing buildings and geographical structures.

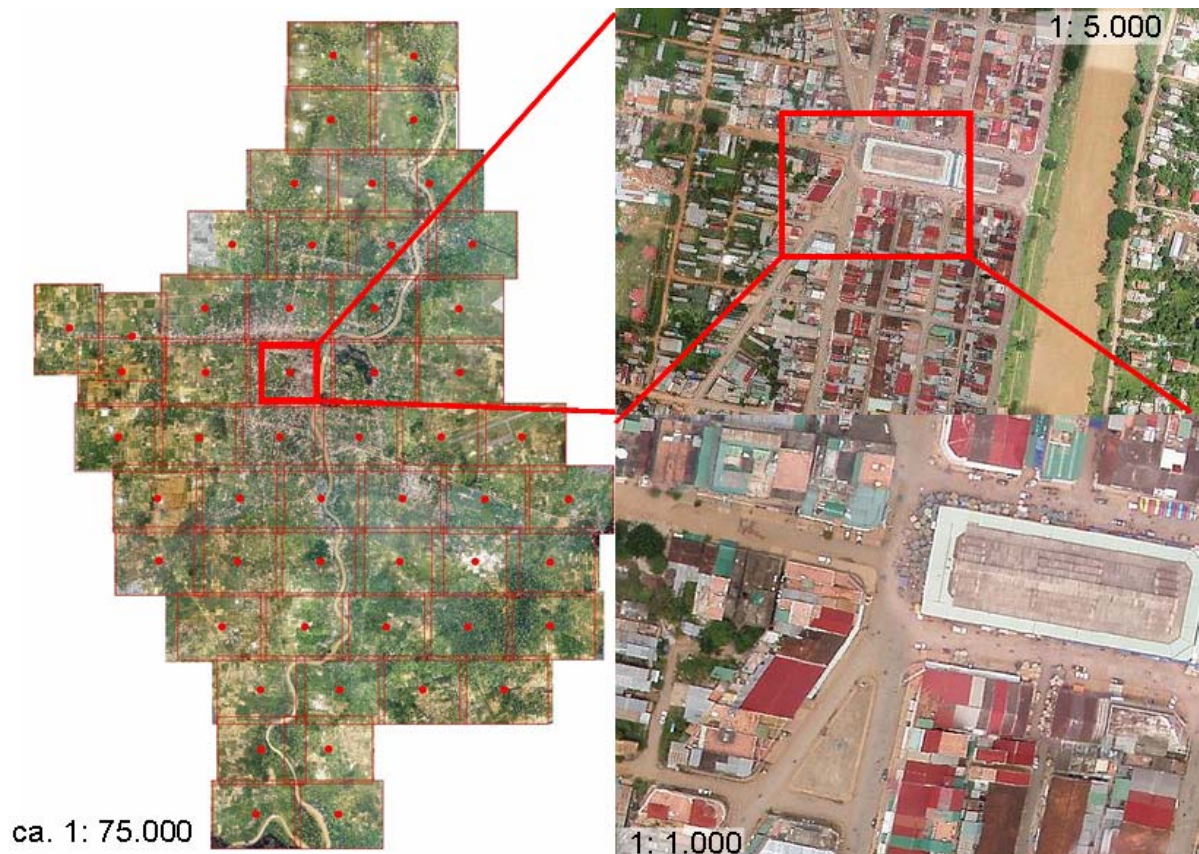


Figure 5: Aerial Balloon Photo mosaic showing the urban and peri-urban region of Battambang and the town centre of Battambang



In February 2005 basic GIS training courses were conducted in Battambang. Through the application of transparent planning measures and the use of GIS technology, this project initiate the process that will result in a participatory land use planning process which will be undertaken in effective teamwork with local authorities and the local civil society.

A first draft of a district master plan for Battambang was developed in 2004 (UHLIG & SCHINDHELM 2004) as an integrated comprehensive development plan that includes all other planning (i.e. from communes, villages departments and other authorities). It gives a perspective for future development until 2020 which covers the whole district area. The content of the master plans in pilot districts consist of a recent Land-Use Plan, a Technical Infrastructure Plan, a Social Infrastructure Plan and additional development plans for selected areas and topics. First priority was given to develop the Land-Use Plan for Battambang in combination with a Road Network Development Plan. All plans and maps were derived from aerial balloon photo interpretation as well as other mapping sources and field surveys. At the moment they are mapped and digitized by a group of university students of the Faculty of Land Management and Land Administration (Royal University of Agriculture, Phnom Penh) on a scale varying from 1: 5, 000 to 1: 10, 000. From May to July 2005 several field surveys on infrastructure, the road network and informal settlements were carried out in collaboration with surveyors of the Royal University of Agriculture (Fig. 6). Next steps draft a map of state land corridor along the urban road network and other state land dispersed over the district area to integrate this data later into future development map for the district.

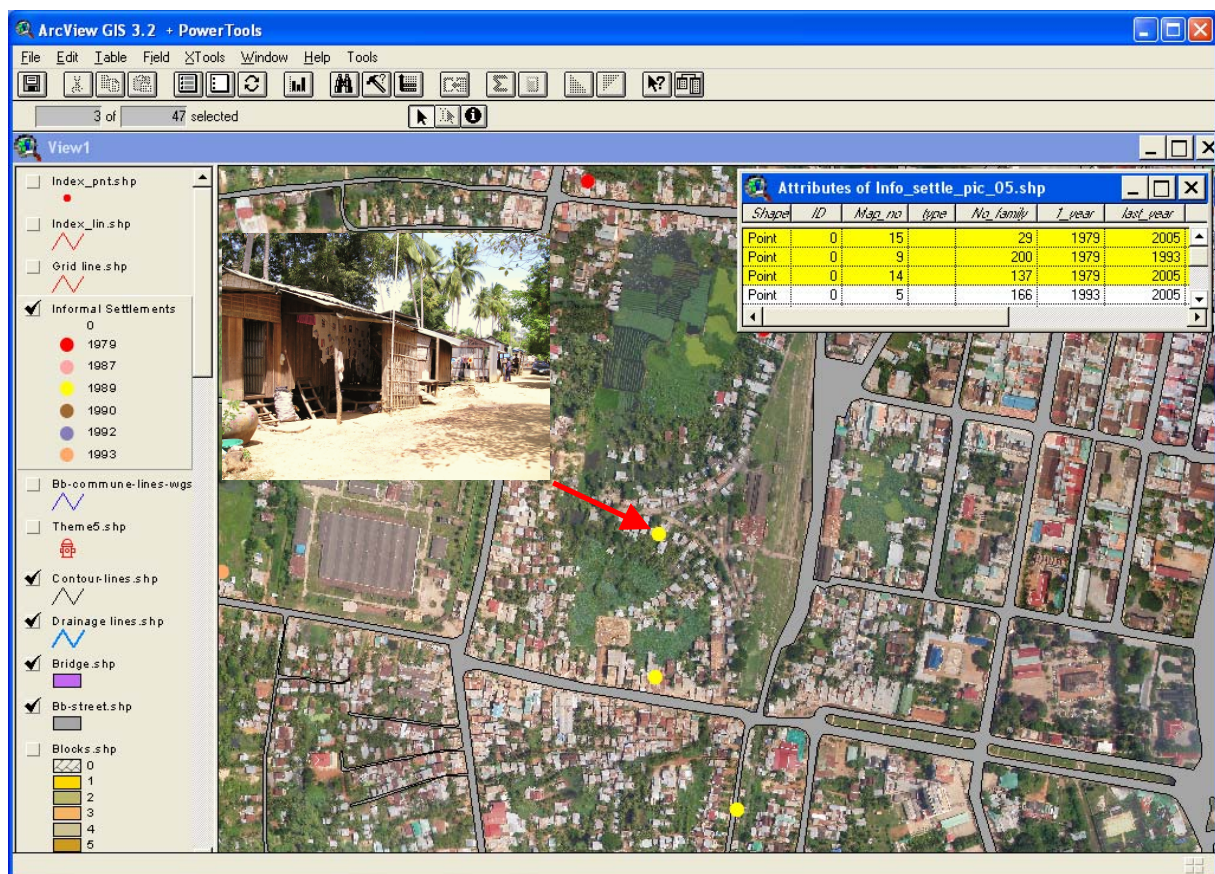


Figure 6: GIS based mapping process of informal settlements in Battambang

## Kampong Speu

The Kompong Speu urban planning project is supported by UN Habitat, DED, InWent and ESRI within the 1000 cities project aims to support the provincial and district authorities of MLMUPC regarding their urban land use planning tasks. It provides a comprehensive mapping source for further land use and master planning procedures by the local authorities (Fig. 7). There are three main purpose of the project as follows. Initially it will contribute to capacity building on a national level giving a possibility to practice and apply land use and urban planning knowledge in a provincial centre (Fig. 7-9). The second aim is to contribute to urban land use planning efforts on the provincial and district level by setting up essential foundations for further urban land use and area planning (SYMANN 2004).



Figure 7: Aerial Balloon Photo showing Kampong Speu centre

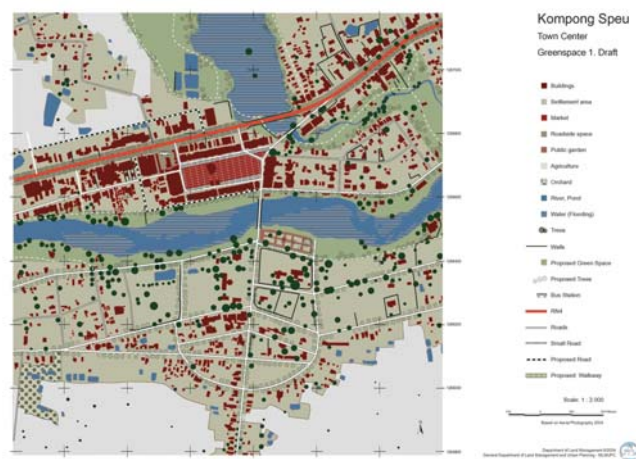


Figure 8: Kampong Speu Town centre urban green space planning concept

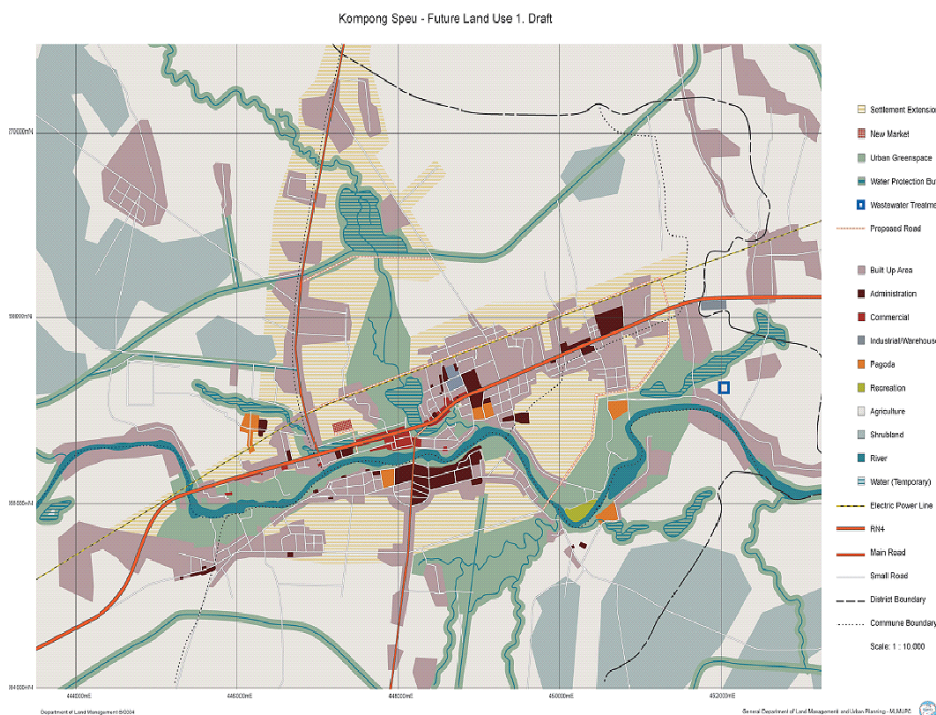


Figure 9: Kampong Speu - Future Land Use 2<sup>nd</sup> draft

In addition to that it promote the Kompong Speu town planning efforts realizing further planning proposals aimed to coordinate the urban development of Kompong Speu Town with the development of the surrounding landscape, like the development of a zoning concept (Fig. 9) as well as the suggestion of an urban green space corridor (Fig. 8) to increase comfort and wellbeing of the Kampong Speu citizen

### **Conclusion**

To conclude, urban development and planning in Cambodia requires transparent improved planning strategies, up to date spatial data technologies, decentralized governance and a strong integration of the civil society to improve the planning process as well as to enhance the capacity of planning and implementing staff in several ministries. There remains still a long a long way to go but increasing technological capacities like low cost effective aerial balloon photography in combination with strong participation of the civil society and all administrative planning levels will achieve a tremendous increase of capacity and planning efforts.

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## **BIOGRAPHICAL NOTES**

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Mr Ralf Symann is an engineer and land use planner from TU Berlin, Germany and DED advisor in the Ministry of Land Management Urban Planning and Construction in Phnom Penh, Cambodia. Before, he had several positions as landscape architect and land use planner in private sector architectural consulting companies in Germany.

Mr. Teang Peng Seang, is a Master of Geomatics and remote sensing from AIT, Bangkok, Thailand and the CEO of the Phnom Penh Geoinformatics Education Centre (PGEC).

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