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Developing land administration in Cambodia

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Abstract

Presently, Cambodia struggles with an ineffective land administration. The enormity of land problems and the insecurity of tenure is a concrete obstacle, for up to 90% of the population. The government has no means of land management through the existing land register at its disposal. The creation of a clear land policy and a land management system are seen as crucial steps towards restoring law and order. In terms of land register performance, a training program is recommended as a short-term solution to improvement. The systematic registration is presented as a long-term solution to the clarification of the situation on land and to the introduction of the security of tenure. The developed method for systematic land registration in rural Cambodia consists of six parts: public information, adjudication, demarcation, surveying, documentation and appeal. The area by area, parcel by parcel and one parcel–one visit principles are applied. The 2 years' test results are encouraging. The method works well, problems are rare and the desire for secured land titles, among the landholders, is high. The main hindrance is represented by the ambiguous legislation. The estimated cost of the first registration with the method is about 15 US\$ per parcel including aerial photography, orthophoto production, systematic registration and title insurance. The evaluation demonstrated that the method is capable of facilitating the general objectives of land registration. It strongly promotes the strategic goals of the Finnish development co-operation. © 2001 Elsevier Science Ltd. All rights reserved.

1. Introduction

This article is based on the author's work on the Cambodia Cadastral Project (later project). Firstly, for a year as the Land Surveyor and secondly for the last two as the Team Leader. The project has been part of the technical co-operation between the Republic of Finland and the Kingdom of Cambodia, which has, since 1997, sought ways of introducing a land register and a cadastral map to the poor majority of Cambodians.

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The article presents the background, the justification and the methodology for systematic land registration in Cambodia. As the background, the first part of the article describes a research on rural land registration in Cambodia. The scars on land issues in Cambodia are described, a legacy of the long period of turmoil, before turning to a description of the research. The research, implemented in nine provinces of rural Cambodia, reveals a very troubled land register, suffering from all imaginable problems. Looking for justification, avenues to improvement are recommended. Following the latter recommendations, the second part of the article presents a system for the systematic parcel by parcel land registration. The implementation experiences, test results, a cost estimate for a countrywide application and an evaluation on the method's potential to meeting standard objectives are presented. Finally, conclusions and remarks are presented.

2. Part 1: the State of the land registration in Cambodia 1999: a rapid field research

This research was a part of the project's background and long-term approach clarification process. The findings (Törhönen and Suon, 1999) had a significant effect on the present state of the project.

2.1. Background

The recent history of Cambodia is dreadful. In 1975, after the revolution by the Khmer Rouge, the post-colonial society was completely reformed. The new leaders declared the year as Zero, introducing an agrarian, totalitarian communism of a volume, not yet seen by the rest of the world. The individual ownership to land was banned, cities emptied and people forced to live in communes, that engaged massive irrigation projects. The infrastructure was literally destroyed, for example, the land registration records were all lost. In 1979, Vietnamese forces helped to overthrow the Khmer Rouge from the main parts of Cambodia, introducing a more traditional type of communism. The land was cultivated in solidarity groups, but slowly, people started to occupy their "own" parcels. In 1989, the government introduced a private ownership to residential and business parcels and possession rights to the cultivation land. However, there was no return to the pre-Khmer Rouge time. The parcel structure had been violently destroyed, people had moved around Cambodia, many had fled and nearly 2 million people (one fourth of the population) had died of hardship. The Khmer Rouge still occupied large parts of the country and many areas were dangerous due to enormous amounts of randomly spread land mines. (Greve, 1993; Lim, 1997; Chandler, 1993)

Presently, cultivation lands are all privately held, despite the areas of Hill-tribes that exist, where customary rights prevail. The proof of occupancy is based, usually, on a rather short period of occupancy and rarely to informal documentation. The land register, according to the common rule of thumb, estimation covers about 10% of all parcels. In 1993, the general elections facilitated by the United Nations started

a long and painful democratisation and normalisation process. The first multiparty government was riddled by conflicts and was unable to unify the country. After the second elections in 1998, the situation has improved and the new coalition government has started reforms that were unimaginable before. The past 2 years have been very positive in Cambodia. The Khmer Rouge, weakened into a guerrilla group in the jungle, finally gave up all resistance in 1998. For the first time in 30 years, the legitimate government of Cambodia had gained control of its whole territory.

Cambodia is still an agricultural society and land has a crucial impact on most people's life. The issues of secure tenure and settled habitat are matters of peace and war. The organisation broadly in charge of land issues is the Ministry for Land Management, Urban Planning and Construction, and under it, the General Department of Cadastre and Geography (later the land register) is responsible for land registration and mapping in the country. Administratively, Cambodia has 24 provinces, which are divided into districts and thereafter, into communes that consist of 10 or so villages.

2.2. Research aim

The aim of the research was to review the resources and performance of the land register's provincial offices, to clarify the overall situation concerning land and in conclusion, to look for justification and avenues open to rural registration. The key issues were the level of security of tenure, the functionality of land management and the status of land disputes and litigation.

2.3. Methodology and interpretation

This field research targeted the land register's provincial offices, other local land administrations, provincial courts, interesting field sites and randomly selected non-governmental organisations. Each register office and relevant targets, were visited during 1 or 2 days. The rapid field research methodology developed for this research utilises thematic discussion as a primary means of investigation. The researchers raise issues to be explored and thereafter, the discussion goes into the directions the interviewees select. It enables the researchers to find and explore fields of interest beyond previous knowledge. Instead of a questionnaire, a rough framework of issues of interest was prepared for structuring the research. The data was instantly documented in memos that were later collectively analysed. The method worked well in terms of exploring a large number of issues. It was found to be ideal for finding the topical issues in each area and office, but it was not considered appropriate for collecting detailed information.

2.4. Implementation

The research team, the author and a Cambodian surveyor, Mr. Suon Sopha, carried out research of the land register offices in Takeo, Sihanoukville, Kampong Speu, Kampot and Kep provinces in May 1999; in Prey Veng, Svay Rieng and

Kandal in June 1999; and in Siem Reap in September 1999. The other agencies visited included the PRASAC (a European Union rural development project) offices in Takeo and in Kampong Speu, the Licadho (a Human Rights NGO) in Kampong Speu, the provincial courts of Svay Rieng, Sihanoukville, Kampong Speu and Siem Reap and the district governor's offices in Kep, Sihanoukville and Svay Rieng. The implementation went smoothly, apart from apparent reluctance of some authorities to discuss land issues. This was surprising, but perhaps understandable, as several big land dispute cases between authorities and individuals had just become famous in Cambodia, causing the land issue to become a highly political and sensitive issue.

2.5. Fieldwork findings

2.5.1. Registration

There are about 1250 employees in the 24 provincial, and one national, land register offices in Cambodia. Two of them have just been created and exist only on paper. There is supposed to be a sub-office in every district hosting a chief, a conservation officer and a technical officer but in practise, the office composition varies from non-existent in the remote rural areas to the busy, well manned, urban offices. All officials reported the register's main tasks to consist of first registration claim handling (referring to the Council of Minister's campaign to register all lands in 1992 when 4.5 million claims were made), sporadic land titling and urban land management in co-operation with the municipal authorities.

In practise, the 1992 claim handling does not occur and the claims, piled in the district offices, are often in a very bad condition. It was found unfeasible to issue titles sporadically, one-by-one, and the campaign became suffocated. For example, in Kandal, that is partly rural, partly urban province and one of the most prosperous areas of the country, 12% of the claims are registered. Prey Veang, which is a rural and poor province, 7% are registered. Presently, in the whole country, the annual number of registered parcels is close to one registered title per employee of the register. The exact figures are not eagerly displayed.

In practise, the register is contracted for sporadic land titling. This is the case, if the landholder faces a land dispute, a land sale, a need for mortgaging or wants to invest in land. The applicant finances every piece of action. In general, there are only residential and business land titles issued. For example, in the Siem Reap town all hotels and relevant businesses have land titles. The agricultural land titles are very rare. A typical rice farmer with a small residential parcel and a couple of rice parcels does not possess land titles.

Note that, seven steps in the sporadic land titling (Fig. 1) mainly or solely control and check activities. During the adjudication, the sub-office investigates the claim clarifying the conflict status, the tenure type and hears the village chief as a witness. During the survey, a parcel drawing is prepared without marking the boundaries. The land registers also broke land sales and draft transfer documents, that provide significant extra income for the land officials in the high-demand-on-land areas. Prices indicated in the deeds are usually forged, in order to keep the transfer taxes

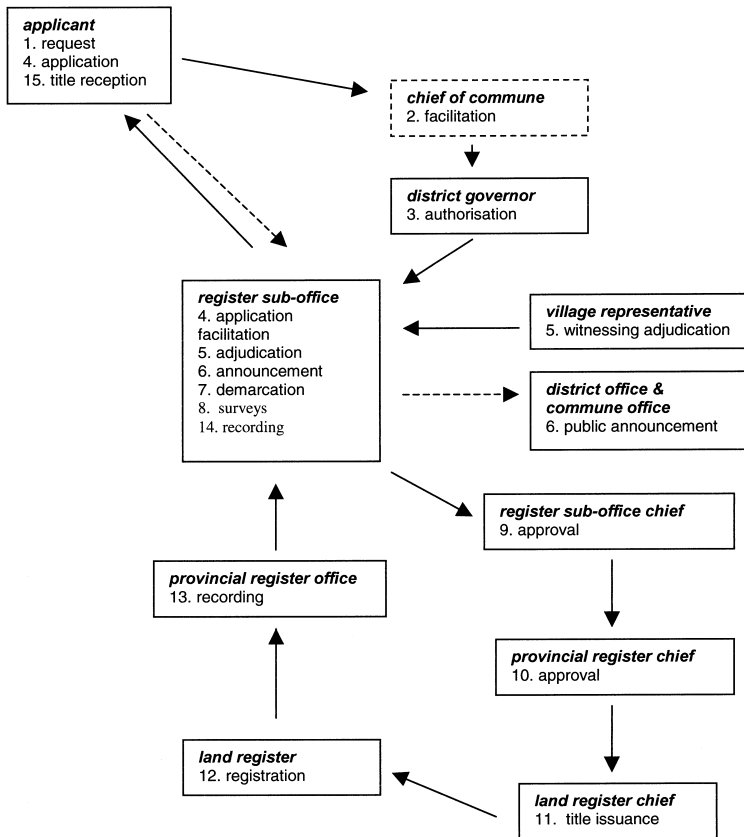


Fig. 1. Sporadic Land Titling in Cambodia.

low. Many, obviously most, of the land sales are not registered. It is a way to avoid taxes, which are collected by a local office of the Ministry of Finance.

2.5.2. Resources and performance

Cambodia lacks educated people in all levels. The office in Kandal, that hosts a suburb of Phnom Penh, has 30% (6% intermediate level ~ BSc, 24% lower level ~ technician) of the staff formally educated, which is a dream figure in Cambodia. In Prey Veang, the figure is 6% (2.5% ~BSc, 3.5% ~technician) and in Svay Rien, which is a very poor area, the figure is one, but not indicating a percentage, but instead a person (~BSc). The reason for such distribution is apparent. The relative prosperity, prevailing in the capital, creates possibilities to build up land professionals' own prosperity. The official salaries are always less than 20 dollars per month. Staff members suggested that a monthly salary of 200 US\$ would be decent, 150 US\$ bearable and 100 US\$ low in Cambodian conditions. The office premises in the provinces were in a relatively good shape. The exception was seen in Svay Rien where the office was an empty building that was literally falling apart. The roof was

leaking, the titles were kept on the floor and the office did not have any money, even for buying blank land books. It is a likely case in several other offices, that exist in very poor areas. Most of the offices were practically empty. The archiving facilities varied from metal desks to open shelves. The state of the surveying equipment was disastrous. Few total stations found were either broken or suffered from big mechanical errors. Tapes were usually broken, and only Kandal office had quite a few tapes.

The overall performance cannot be very high in this kind of situation. Human resources in legal issues are more difficult to judge than their technical counterparts, but the impression is clear. The administrative rules and regulations are obeyed very well and every office has adequate knowledge of issues that need to be stressed. The proof of this is, for example, the sporadic land titling, which is done in exactly the same manner everywhere (Fig. 1). The problem is that there is no proper work culture for quality work and the work is often executed, technically, poorly. There are also signs of neglect, but one gets an impression that these cases are exceptional. The land titles are handed out based on surveys without angle measuring, poor or non-existent local or national reference and without a cadastral map. The quality of the survey plans is visibly low, usually only describing a rectangular parcel with no other markings than a north arrow and an area figure. The lack of technical quality creates a situation where a land survey exercise might create more problems than it will solve.

2.5.3. Land issue

The land register's influence on land is limited to registered land. All other agricultural land is under the authority of the district governor and all the residential land is under the provincial governor. The authority's power over land is often executed without consulting the land register for the possible existence of land titles, and on many occasions, new allocations have been made to titled areas. In legal terms, people occupying land without a title are squatting on the government's land. Since about 10% of the parcels are registered, 90% of the land holdings are outlaws, depending on the good will of the authorities and have no legal means of reacting against unfair treatment. Some judges declared that non-titled land is under the authority and beyond the courts' rule, until the authority breaks a law. Another opinion, presented, was that the people could claim against the authorities' power, with tenure based on the long-term occupancy. This is based in an ambiguous provision of the Land Law (1992), recognising 5 years of consecutive possession, as proof of ownership. In any case, the land tenure system is very insecure for individual land holdings. On top of that, there are no clear administrative boundaries either, so even the local authorities' power over land is, in many areas, unclear. The system of land dispute settlement varies. There is often a committee established between the district and provincial governors and the land register chief and sometimes with a judge and the police chief. However, these committees hardly function.

The most obvious land dispute in Cambodia relates to the long period of turmoil that forced people to move across the country, even more than once. Most of the

pre-1979 holders that abandoned their land, are trying to get them back. A new occupant usually refuses and the present government's policy is not to hand over the land (Land Law of 1992). In the many areas that have been under military or militia rule the land disputes are numerous and harsh. The army constantly violates land rights. Neither the land register, nor the people nor other local authorities have the means to stop it. The military categorically refuses to hand over land that they occupy to the previous owners.

A very big problem, are the 4.5 million claims that the land register received for land in 1992. For each claim a landholder received a stamped receipt as a proof of the filled claim form. The receipt has no other legal power. However, people often consider it to be more and treat it as a land title transferring them frequently and even using them as collateral. A number of ownership disputes base on the claim that the receipt proves that someone is, or is not, the legal owner. At present, these receipts are banned from being handed over. However, the 4.5 million receipts remain at large. Another register created problem grows from the low technical quality. Where the demand and value of land is high and where land holdings have been unsettled for a long time, the overlapping land titles are numerous. In Sihanoukville, for example, which is a potential beach resort area, the team witnessed such abstract survey plans that the overlapping land titles are not surprising. Often a district or provincial authority, together with the register staff, starts land development with a low quality survey sketch. The authority divides the area into small parcels without field checking. The parcels are then distributed via shady markets. However, the new parcel owners might never be able to find their parcels, as the original area might have been a lot smaller than the sketch described and, perhaps, the first occupants have already taken all the available area. Every landholder with or without a land title, who does not live on or close to his/her parcel is in great danger of losing the land. There are cases where a titleholder had lived elsewhere and given his/her parcel to an overseer. The overseer turned out to be a con man and applied for a title for the same parcel, but made sure that the official was not the same who had facilitated the previous title. As the technical quality is low the land officer could easily hand out the new title without understanding that there was actually already a land title issued, to the same parcel.

People often occupy land that has been designated to belong to reserve land. An obvious reason for this is that the reserves themselves are not demarcated and their extents are unknown. Government organisations frequently declare land rights and restrictions overlapping with private ownership, for example, when establishing natural reserves, water sheds, fishery and forest concessions without consulting the land register, the local authorities or the present land occupants. For example, the 5000-ha nature reservation area established to the Kep, has no concretely known limits. The same applies to most of the reserves and concessions. If an area was defined, there would be no transparent method for measuring the proper compensation rate to the occupants or to even define who are the rightful occupants. At present, the compensations depend on the concessionaire's or authority's good will. There are also cases where the number of occupants of an area has multiplied as rumours of future expropriation spread.

One of the most publicised land issues is that of the borderlines between Cambodia and its neighbours Vietnam, Laos and Thailand. For example, in Svay Rieng people say that the Vietnamese continue to push border towards Cambodia. The main dispute there is over an area of roughly a 100 ha, where six Khmer households, half of a village, stay in an area now considered to be on the Vietnamese side of the border. The settling is difficult as no accurate documentary evidence exists on either side. This dispute, and other similar ones, is clearly more a political than a land ownership problem.

2.6. Interpretation and recommendations

It is evident that the land register is executing its task ineffectively. Why? There is a general lack of clarity in the land management system in Cambodia. The officials follow the land administration rules well. However, those rules are created bit by bit, without a clear knowledge of their aim. The absence of land-related policies is a problem. There are technical problems. It is impossible to carry out proper cadastral surveys if there is no equipment for measuring or knowledge of their usage. There are legal problems. Most of the individual holdings are outlaws. The land tenure system is not clear, causing different authorities to conflict on the land use and land interests. The public reserves are not well defined or demarcated. There are educational problems. The public does not know their rights and duties concerning land. There is a general problem of respecting law and order. There is a group of people, who clearly benefit from this confusing land situation. Finally, why do people not apply for land titles? The reason is simple. They cannot afford it. The registration has numerous steps and each step requires official work that does not occur without a reward. As a result, the land registration has become out of the reach of the great majority of people.

Cambodia needs clarity and transparency in land issues for the restoration of the security of tenure, the law and order and the trusting of the authorities. This would turn the system from an obstacle to a tool for the reduction of poverty. At national level, clarity requires clear policies and guidelines for the establishment of necessary legislation and institutional framework for the land management system. A land policy is the most important place to start. The legal system needs support for handling the land disputes. Looking at the land register's task of registering all lands and issuing land titles throughout Cambodia, both short-term and long-term avenues of development are recommended. In the short run, *the land registration personnel should receive basic technical and legal training* in order to improve the quality of the work. Simultaneously, they should in some areas be provided with, and in other areas be encouraged to invest in, basic surveying equipment such as compasses and tapes. In the long run, however, the improvement of personnel's technical skills would do little towards solving the basic problem: 90% of Cambodians are outlaws in land matters. Present sporadic registration will never reach the great majority, no matter how well the register officials would work technically. *Therefore, it is recommended that a systematic approach would be applied, with the aim of registering all land parcels in Cambodia.* Only the systematic approach would be public enough to

ensure the equal treatment of all landholders. It would put a stop to the position of power, exercised by the strong over the weak, and provide adequate basis for investments, natural resource monitoring, the public reserve protection and so on. It would bring the vast majority of people, under the rule of law and into the reach of the modern society.

3. Part 2: Systematic Registration for Rural Cambodia; method, test and evaluation

Following the latter interpretation, this part of the article presents a system for the systematic parcel by parcel land registration. The method (Törhönen, 1998c), the cost estimation (Törhönen, So, & Suon, 1999) and the test results (Suon, 1999) have been published previously in work reports.

3.1. Background

The systematic parcel by parcel land registration is by no means a new invention. Simpson (1976, p. 268–291) and many others introduced the functions of systematic adjudication, a long time ago. The experiences of land adjudication in Thailand (Burns, 1985, Williamson, 1990) have, in particular, influenced the system's development in Cambodia. The author's contribution is an attempt to develop the systematic registration further, so that it will be so easy, cheap and democratic that it meets the requirements of a developing country from a legal, economic and human rights point of views. According to the author's view, only the rather recent technical advances have enabled reliable results from the systematic registration without creating an unfeasible mammoth system for a developing country.

3.1.1. Principles

In the light of the complete absence of officially documented data on property rights or physical extent of a property, the corruption and the generally poor enforcement of laws, only a method, which ensures maximum transparency and publicity can meet the requirements of equality. The absence of legal documents also rules out alterations, where field visits would be avoided. Therefore, the preconditions of registering all lands, visiting every parcel in the field and using verbal testimonies as primary evidence for adjudication set the framework for the system. As a result, there are numerous official gatherings where apart from the landholder in question, the neighbours, and other interest holders also have to have the right to be present or represented. If one pays any attention to feasibility, there are no other methods left to consider, other than the one that concludes the whole process at one time for an area.

Evidently, the system has to be cheap, effective and cause minimum inconveniences to the people, who are busy struggling for survival. The author's earlier experiences (Törhönen, 1998a, b) suggested that the biggest hindrance for the systematic registration is the mobilisation of landholders. Consequently, the system introduced was to go to the people, instead of waiting for them to come to you, and

to contact everybody only once for adjudication, demarcation and surveys. All this resulted in the application of the area by area, the parcel by parcel and the one parcel–one visit principles. The latter had been explored in the research of the Zimbabwe communal lands (Törhönen & Goodwin, 1998). It led to the integration of the demarcation and adjudication functions. The idea was also to develop a system that could be handled by a single officer, utilising landholders as surveying assistants. The integration of adjudication and demarcation processes also raised some worrying questions, like how to protect people's rights in such a quick procedure? The solution was to ensure that public information, the adjudication and the demarcation were accessible to every landholder and most importantly, that all landholders would have a right to study all recorded information and appeal against it in an organised manner. An apparent technical requirement was that the applied technology had to be capable of producing the appropriate results. It was recognised from the very beginning that an appropriate result in Cambodia would be flexible in terms of surveying accuracy and boundary marking. Boundary marks are not used in rural Cambodia and the boundary lines are clear, although often not straight. A modest surveying method would likely overcome the accuracy of defining the boundary corner point, as those were generally not considered as points but kinds of "corner areas". Therefore, the surveying accuracy needed to be only as high as needed for the purpose, i.e. convincing a potential buyer, a tax authority or a money lending organisation.

3.1.2. *Components*

The method consists of six components: public information, adjudication, demarcation, surveying, documentation and public display (later the appeal). The public information and the appeal have been delineated into independent components, in order to stress their importance in ensuring equality and overall success. They are especially important in an emerging democracy, such as the one in present day Cambodia.

Public information is primarily needed for gaining public support and secondarily for organising the practicalities. In Cambodia, the long period of instability in the society represents difficulties for the public information campaign. There is a certain level of mistrust of official information. A properly planned, local level, public information program tries to define the natural leaders and the right media with which to reach the landowners. Based on the experience in Africa (Törhönen, 1998a, b), the best results are achieved by discussing with the natural leaders, who will explain the process further to the landowners. Special attention has to be paid to the weak groups. Women are often potentially weaker than men, in terms of securing their land rights. Other vulnerable groups might be the poor, disabled, illiterate, etc. In the worst case, an ignorant registration procedure could enable the powerful people to take advantage of the weak and formalise land grabbing. Prevention comes in the form of publicity, leaving little space for corruption and other violations. In practise in Cambodia, official letters have to be delivered to all regional and local authorities, as the start of the information campaign. The crucial personal meetings can then be organised between the register staff and the district governor,

the commune chief and the village chiefs. If they were unco-operative, nothing could be done. This is the public information procedure that meets the formal requirements in Cambodia. Inevitably, additional meetings are needed at the village level, in order to have a direct information channel to the people. As a result of the public information, landowners should know about the land registration procedure and what is required of them, the benefits of the process and understand its non-political nature.

During the *adjudication* (Fig. 2) the existing rights in parcels are ascertained, not altering the existing rights or creating new ones. It establishes what rights exists, by whom they are exercised and to what limitations they are subject. It produces certainty and finality into land records. The core question of the adjudication is “Who owns what?” In Cambodia, the adjudication is done simultaneously with the demarcation. It means that the adjudication officer and the demarcation officer literally go together to the parcel in question on the agreed date. After the boundary lines have been demarcated, the demarcation officer may proceed to the next parcel and the adjudication officer continues by filling the parcel forms. This is a delicate process, since there is scarce concrete evidence. Naturally, all the documents presented are examined for proofs of ownership and identity, etc., but often nothing exists. Therefore, oral testimonies are recorded by the owner, witnesses, local leaders and elders, etc. for evidence. In case of disputes, settlement is encouraged, but if not reached, the adjudication officer makes the decision, which can be objected in the appeal.

The *demarcation* (Fig. 3) is the process where the boundaries are delineated and agreed upon with the adjoining owners or other interest parties. For the landholders, this is the most concrete part of the whole exercise and plays a major role in the overall success. Each boundary corner and boundary line will be clarified. The present boundary system in rural Cambodia is essentially a fixed boundary system,

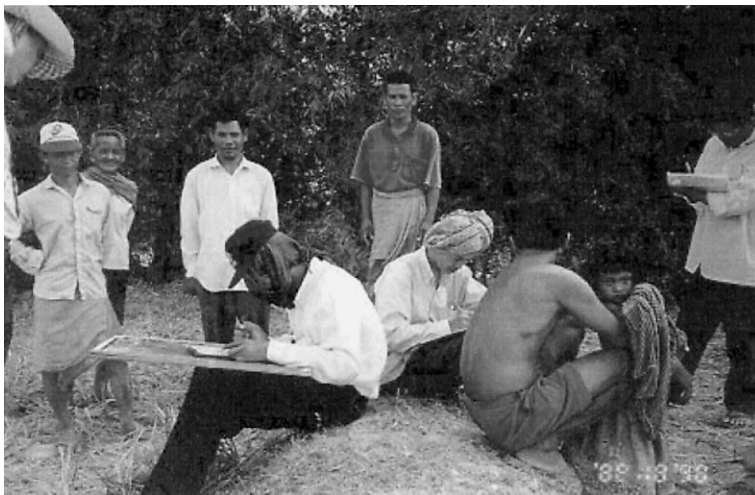


Fig. 2. Adjudication meeting in the field.



Fig. 3. Demarcating an agricultural parcel boundary.

although, for example, in rice fields, lines do follow permanent, built structures. Boundary lines are narrow and defined, not necessarily straight, but a wide no-man's land characteristic of a general boundary system, does not exist.

Therefore, the boundary corners are defined as accurately as possible, paying a little bit less attention to the exact delineation of each boundary line. Presently, no regulations exist concerning possible corner markings for parcels. There are no boundary marks found and no visible reason why they should be placed. The present policy is that the marks can be used upon the owner's request and at the owner's expense.

Surveying here means the process whereby the cadastral map is surveyed and the parcel is fixed into a coordinate system. The surveying needs to be cheap and effective. Therefore, it is important that the demarcation and surveying are not alienated. The methods that require separate field teams for parcel surveys are old fashioned, complicated and too expensive for a developing country to maintain. The solution can be found in orthophotography. It is especially useful in Cambodia, due to its large flat cultivation areas. The prerequisite is the existence of covering and updated aerial photography. In Cambodia, a monochromatic slowly outdated aerial photography in 1:25 000 from 1992–1994 covers the entire country. The two levels of surveying include the ground control surveys for the orthophotography, utilising GPS technology and the parcel surveys that rely primarily on the photo interpretation. Cambodia has an automatic orthophotoline (the Orthomat software) that has been successfully used for the production. The boundaries and the corner points are identified on the 1:1000 orthophotography printout, enabling less than a quarter of a square meter accuracy to be gained. The agricultural corner points in Cambodia are often a lot less accurately definable. In the agricultural areas, most parcel corners are visible in the orthophotography and only minor amendments and fixing are necessary with extra surveys. The agricultural parcels can be completed during the

demarcation, using a compass and a tape, but in the residential or business centres, separate total station surveys may be used.

In the *documentation*, the land register and the cadastral index map are produced and stored. In practise, it often means the set-up of both graphical and text databases together with wide selection of soft and hardware combinations. Consideration should be paid to the feasibility level, with regards to conditions in the developing country. In Cambodia, locally available technology and solutions have been sought for. The adjudication and demarcation data is inputted into a simple cadastre GIS (Fig. 4), based on the Microsoft Access (MS Office, 1997) and the French GIS-software called the GeoConcept (GeoConcept SA, 1999). The Access database hosts the attribute data and the Geoconcept is used for the cadastral map creation. A user operates the Cadastre GIS with an easy user interface, designed to be operated by staff with low technical training. The graphical and textual data are integrated by a unique parcel reference number that follows the administrative structure. In Cambodia, there are no maps available which can be utilised as a base map. However, the existing aerial photography provides ideal, updateable, base map material, and therefore, the boundary layer is built on top of the orthophotography. This is the beginning, and it is recognised that especially the database has to be developed on to another level, when the data entries rise.

The *appeal* found its form almost a year after the technical testing had started. This was due to the lack of necessary legal provisions in the Cambodian land legislation (Tolvanen, 1999). The appeal is a very problematic part of the whole thing. There has to be public access to the recorded data, in order to ensure the equal treatment of all parties. The records, both graphical and textual, are shown for 30

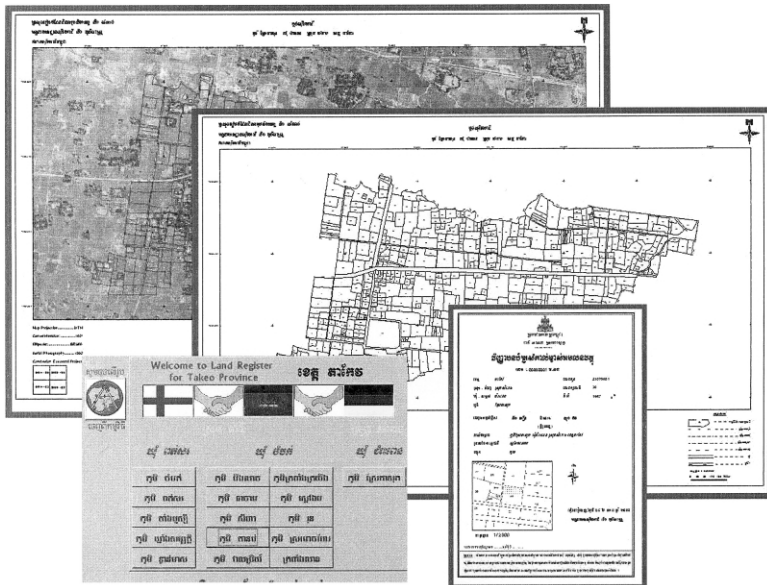


Fig. 4. Cadastre GIS: the Cadastral Index Map, the land register user interface and a draft land title.

days in the centre of the village and notices are provided in all available media. The landholders have a right to claim against any technical or juridical problems that they think remain in the records. However, there are weak groups that may not have equal opportunities to explore the records or cast an appeal against them. This has been tackled by providing an assistant to show the data, explain it, and assist in making the claims. In Cambodia, for the first time in a long time, there is a weak but noisy opposition in politics, which has promoted the authorities to become alert towards unfair treatment of the people. After the 30 days, the claims are handed over to an ad hoc administrative commission, which is represented by the local government, the local people, the government and the registration authority. In cases involving disputes, they try to ensure a settlement between the disagreeing parties. The unsettled cases are handed out to the courts, while others proceed to the first registration and the title issuance.

3.1.3. *Registration team*

There are two basic realities in Cambodia, which were taken into consideration when the composition of the field registration team was planned. Firstly, the severe lack of trained personnel, and secondly, the severe lack of all other resources. Consequently, the teams had to be well organised and tasks carefully planned, in order to enable staff with a low education to adapt their duties. The *field manager* leads the fieldwork, manages the resources, ensures that the laws are obeyed, people treated equally and those in need, receive adequate counselling and help. He also informs the local authorities about the work, so that they can guard the public interest. Finally, he is a member of the ad hoc commission and the primary implementing force of the appeal. The *public information officer* carries out both formal and informal public information from provincial to village level. He organises the opening meetings, media releases and spots, and informs the people on their rights and duties over the process. The *adjudication officer*, who is a legally competent surveyor, adjudicates all rights on land. The advice has always been to encourage people to settle the disputes on the spot, but if not, the adjudication officer makes the decision. The *demarcation officer*, who could be the same as the latter, demarcates and photo-interprets the parcel boundaries, together with parties concerned. He also issues a temporary parcel number to the parcel, which will then be marked on the adjudication documents. The *surveying officer* is responsible for ground control surveys, surveying of non-interpreted parcel corners and other geodetic work. The *recording officer* inputs the field material into the GIS and operates it. The *quality officer* is responsible for all recorded land registration data meeting the qualifications. In practise, a *local contact*, either the village chief or another representative, participates in the work as a team member, ensuring that the landholders can be informed and mobilised flexibly.

3.2. *Legislative framework*

In order to be feasible, the systematic registration had to bypass the present bureaucratic title issuance chain. The data concerning an adjudication area had to be handled and approved simultaneously, otherwise the incoming individual title

claims would soon create a backlog. Therefore, new legal provisions were drafted (*Sub Decree on the Procedure of Establishing Cadastral Index Map and Land Register*, Tolvanen, 1999) legalising the systematic procedure and creating a new avenue for the first registration area-wise. For the task, an ad hoc commission involving the field manager, the local government and the local community was created. Its duty is to organise the appeal, to check and approve the record and to settle the possible disputes. Naturally, the cases of disputed parcels are taken to court after the appealing period. The present Land Law of 1992, which is considered ambiguous (Viitanen, 1997; Hautala, 1998; Singer, 1998; Tolvanen, 1999), is the base of the tenure today in Cambodia. Despite the contradictions in the law, it establishes private land property, but only with regards to urban and residential parcels. For the agricultural parcels, only possession rights are enabled. One of the biggest sources of confusion are the provisions concerning the public land, which are not to be registered and where no private rights can be enjoyed. The public land is defined so broadly, for example including forests and hills, that often rights are insecure because of the confusion over whether the land in question is public or not. The indigenous rights are not recognised in the law, and only groups that still obey customary rights on land live in the mountain forests i.e. on a public land. Presently, there is a new draft land law under preparation, the aim of which is to solve the ambiguity, recognise the customary tenure, establish private property rights for both urban and rural lands and clarify clearly the distinction between the private and the public properties.

3.3. *Pilot area results*

The developed systematic parcel by parcel land registration system has been tested for 2 years in pilot areas in southern Cambodia. The first village registered was the Sre Tasok, in the Sam Raong district of the Takeo province, and later, seven others were completed in Takeo. Another demonstration was made in the Prey Nup district of the Sihanoukville province, where during the period of 6 months, 6400 agricultural parcels were registered belonging to a huge rice cultivation scheme. The system works well. The key has been to win the trust of the villagers and the work itself has gone smoothly. After proper information, the reception among landholders has been very good and the desire for land titles is high. The principles of transparency and publicity have proved adequate, in terms of defining the rightful owners. Problems only arise, if the owner does not live in the village and has no relatives to look after his/her rights. There are no reliable and covering media, that can be used for the informing of city dwellers. This, however, in the present Cambodian circumstances, is not a big problem because in practise, people maintain the contact with their possession or loose it anyway. The owners that have showed up, have mainly relied on the internal village information. The technical work has gone as planned. The photo-interpretation is simple and easy, and less than half of the residential parcel corners have had to be resurveyed using conventional surveys and basically none of the agricultural parcel corners. Unfortunately, the adjudication and the demarcation works have not, so far, been carried out by a single officer. The Cambodian surveyors have been reluctant towards this idea, perhaps due to the

social aspect of doing the work together. It has also been remarked that it has not been safe for a government official to move around alone, until recently. This is not very important, as long as it does not create two differently timed sessions. In terms of people's rights, it is considered essential that holders see the demarcation and the adjudication at once on the spot, making it easier for them to understand what has been agreed and recorded. The adjudication suffers from the ambiguous legislation and, especially, the boundaries between the public and the private lands have caused confusion. The roads and the canals are public land but there are no clear provisions, only a changing recommendation by the Ministry of Public Works, describing their widths. An entire village had to be left out from the registration as a dispute prevails, concerning whether the area in question is actually a national park. The park has been established without declaring the actual limits, but only declaring the size and the name of the area. In terms of efficiency, the results show that in the project's pilot areas, one parcel registration including the field (adjudication, demarcation, surveys, but not including the orthophoto production) and office work (public information, documentation and quality checking) has taken about 0.3 man working days (Suon, 1999). Additionally, about 0.1 working days of management and general work have been consumed. Consequently, the speed of registration has been 0.4 working days per parcel or 2.5 parcels per officer per day. With regard to only the fieldwork, the two officers' adjudication and demarcation team has completed, on average, 10 parcels per working day.

3.4. Cost estimate

Based on the latter results, a cost estimate was calculated for systematic registration to cover all Cambodia (Törhönen et al., 1999). First, the variables were defined. The idea was to figure out the cost per parcel, per area, per province and the total costs for a 10-year program that would presumably be enough for the completion of the task. Additionally, the cost estimate covers the estimated training required for the field office staff and the roughly remaining development cost, in order to complete the legal and institutional framework for the first registration and for a functioning land register. Cambodia has a total area of 180 035 km² that has been divided into 24 (20 provinces, four municipalities) provinces hosting about 11 million inhabitants. There were 4.5 million land parcel ownership claims made during the registration campaign in 1992. The actual number of parcels is expected to be bigger but the number of claims was used as a base for calculation in the absence of more accurate information. Consequently, in a specimen province, which is totally speculative, there are approximately 7500 km², 190 000 parcels and 460 000 inhabitants.

The estimated province office staffing is based on the estimation that nine field teams of two officers and a shared driver maintain an average speed of 10 completed parcels per day, and an office team of about 15 can keep the same pace. Approximately, 40 officers with the pilot work pace of 2.5 man working days per parcel, would mean close to 10 years' work per the specimen province. Please notice that only the actual working days are counted, and possible administrative or political delays are not considered. The national headquarters is thought to host a staff of a

few dozen officers. The technical side, including the land surveys, the mapping and the GIS as well as the legal, publicity and the economical sides of the work, should be represented. Naturally, the headquarters would host the leadership for the national registration. The costs counted include the salaries, the running costs and the general costs. Salary levels utilised varied from non-professional assistants' 80, professional workers' 200 and managers' 300 US\$ per month. All costs calculated are based on present day prices ignoring the influences of interests or inflation. The equipment cost follows the idea that most of the field surveys will be carried out with the orthophoto. The photo-interpretation will be completed by simple compass and tape surveying and total station surveys. The training cost estimates are based on the idea that the operational tasks are very simple and can be adopted for use, with quite moderate training of, perhaps a couple of months per province office. Naturally, the national headquarters' staff has to be highly qualified. The development costs roughly consider the work still ahead, before Cambodia has the necessary institutional, technical and legal framework for the systematic registration ready. It is remarked, however, that no land management system in the world is either perfect or complete and there will always be further development needs.

The main general costs, which are included here, as a part of the fieldwork costs, are those associated with the base map. Previously, it has been estimated (Wik & Lim, 1998) that the cost of an orthophotoproduction covering the entire country, 90% based on the 1:25 000 aerial photographing and 10%, the major urban areas, on the 1:10 000 aerial photographing, would cost about 1 US\$ per parcel. Therefore, the estimated cost of the orthophotoproduction for Cambodia would be 4.5 million US-\$, 190 000 US\$ per province and 25 US\$ per km². An open bid is considered to be a more efficient way of producing such a map, than for it to be carried out as public work, which apart from aerial photographing, would also be possible. The calculation shows that 50% of the systematic registration's costs (the fieldwork and the office costs) come from the personnel, and 50% from the running and equipment costs. Consequently, the total costs of the 10 years' systematic registration for the 4.5 million land parcels are estimated to be:

headquarters	3 million US\$
fieldwork and office costs	50 million US\$
training	0.5 million US\$
development	10 million US\$
miscellaneous	10 million US\$
total	72 million US\$
total/parcel	16 US\$
(total/hectare	4.1 US\$)
(total/km ²	410 US\$)

There are no reliable sources to estimate the actual total number of parcels in Cambodia. However, an understanding, prevailing among the land register staff, suggests that in 1993, only about 70% of land parcels were claimed due to the instability in areas under guerrilla war, insecure holdings and shortcomings in information and logistics. Should this be true, the total number of parcels would be

close to 7 million instead of the here considered 4.5 million. The costs of first registration are mainly parcel attached, as each parcel needs to be adjudicated, demarcated, recorded and documents produced, which in terms of work load or time, do not depend on the size. Therefore, it is likely that the cost per parcel remains close to the level of previous estimation that was based on the lower number of parcels. Mainly, only the one US dollar per parcel, estimated from the base map costs, is not a parcel attached cost. Some per-parcel savings could be achieved through the improved logistics. Consequently, for a reasonable estimate, one can multiply the cost/parcel, reduced by \$2, with the estimated 7 million parcels. An estimate for total costs, if the number of parcels would be 7 millions:

total	98 million US\$
total/parcel	14 US\$
(total/hectare	5.4 US\$)
(total/km ²	544 US\$)

3.5. Evaluation of the method's potential success of meeting objectives

Finally, an evaluation, which judges the method and its anticipated countrywide application's ability to meet the rather standard objectives, is added. First, as a potential donor co-operation target, an evaluation is made on how the systematic registration meets the strategic goals of a European donor co-operation. The sample of the Government of Finland is applied. Secondly, the systematic registration method's ability to meet the general objectives of land registration is considered.

3.5.1. Systematic registration in Cambodia and the development objectives

Reduction of poverty, protection of the environment and the promotion of the social equity, democracy and human rights are the strategic objectives of Finland's development co-operation policy (Finland, 1997).

3.5.1.1. Poverty reduction. The land registration is a factor among many that, depending on the others, have impacts to the poverty. The low security of tenure prevailing in Cambodia especially among the poor rural population, who are highly dependant on their land holdings, inhibits the utilisation of even the lowest resources. Development needs inputs and a lack of secure tenure hinders all long-term inputs on land promoting both over and under exploitation of the resources. The systematic registration of rural land holdings, would introduce a secure tenure intended to reduce poverty through increased but sustainable utilisation of land resources. The method developed has been designed to specifically protect the rights of the weakest, which is achieved through transparency and publicity. It is recognised, however, that the poverty reduction impact is only achievable over a long-term period and that only countrywide application will bring alleviation to masses.

3.5.1.2. Protection of the environment. The systematic parcel by parcel land registration will clarify all land-related interests in a selected area. In light of enormous

difficulties of managing and protecting the reserves and protected areas, which have often been enhanced by the fact that their physical extents are not known, the clarity of boundaries between reserves, public and private holdings would make a huge difference to their protection. Equally, the introduction of secure tenure enables long-term planning to be used in farming decisions, putting an end to exploitation and allowing, for example, planting of the new forest to become an interest of the land holder. Presently, it is often better to suck everything out of land, while it is still possible, in fear of the holdings being lost.

3.5.1.3. Human rights, social equity and democracy. Land rights are human rights. Their promotion is very important in this kind of a society, where land holdings are usually close to all of the families' wealth. In the systematic registration, equality is achieved through the participatory and transparent manner, in which the adjudication and demarcation are conducted. Everything is done literally with the landholders and rights and duties defined by the landholders themselves on the spot. As a democracy aspect, the registration would bring 90% of the people, who presently have outlawed land holdings, under the rule and the protection of law. This is only the beginning and especially the database has to be developed further when the number of data entries rise. In Cambodia, for the first time in 30 years, these preconditions have been met.

3.5.2. Systematic registration in Cambodia and the general objectives of registration

A consideration is made here, of the countrywide systematic registration's potential in meeting the general objectives of registration, as stated by Professor Williamson in 1986 (Williamson, 1986).

3.5.2.1. Certainty of ownership. In Cambodia, the insecurity of tenure is a severe problem and there is no doubt that if all peasants in an area had a documented proof of ownership, the positive consequences would be numerous. The biggest worry relates to general poor enforcement of laws. If powerful organs continue to break laws and misuse power, as is presently the case, the registration might not change a great deal. Therefore, it is important to introduce a covering system, which is transparent and publicly accessible. This would once and for all leave little room for a shadow play.

3.5.2.2. Security of tenure. There are tremendous benefits to be gained in Cambodia by securing the tenure, in terms of protecting the natural reserves, discouraging the overexploitation, encouraging the long-term utilisation of lands and stabilising the troubled post war society. A prerequisite to the introduction of the secure tenure is that the clear tenure provisions are codified in the Land Law. Thereafter, the systematic registration serves as a vessel for spreading the system.

3.5.2.3. Reduction in land disputes. This is an evident short-term benefit, which would be a very important stabilising factor for the Cambodian society. The method is technically capable of creating sound results and reaching settlements. Consequently,

most of the potential ownership and boundary court cases would be dealt with during the adjudication.

3.5.2.4. Improved conveyancing and stimulation of the land market. With such a low security of tenure, as in Cambodia at the present time, conveyancing is very problematic and the land markets are a braves' sport. After the systematic registration, all parcels would be registered, including connected rights and duties, providing a totally new level of reliable information to transaction parties.

3.5.2.5. Monitoring of the land market. This would be achieved by following the land transactions in the register. The fact that everybody around has a title encourages people to update the register, upon conceiving. If the possessor does not have the title, somebody else does. This causes the register to be generally updated with small delays. This is only achieved through the systematic covering registration.

3.5.2.6. Management of State lands and recording of land-resource information. This is a revolutionary change! The government would, for the first time, achieve reliable and updated data on what it actually owns, and could start to develop monitoring procedures and improve its resource utilisation. The land resource information connected to individual parcels would give information for planning and valuation based on no recorded data at present. In the developed method, basic valuation data like the location, the main land use type and the size are accurately recorded.

3.5.2.7. Support for land taxation. The land register that would be created provides a basis for property taxation, but perhaps more importantly in the short run, it would significantly boost the transfer tax collection. The fact that everybody would have a title, would encourage people to update the register upon conceiving and consequently bring them into the reach of the transfer tax. At present, the transfer tax is largely avoided.

3.5.2.8. Improvements in physical planning and facilitation of land reform. The register provides a sound base for a land reform and an urgently needed base for planning. Presently, plans float in the air, without even having a topographic base to lean on.

4. Conclusions and remarks

This article has shown that the security of tenure needs to be improved quickly. The covering land register, which can only be feasibly implemented through a systematic approach, would have a strong impact on it. Based on the test results, it is evaluated that the systematic method, developed in Cambodia, is capable of reaching the general objectives of land registration and it strongly promotes the strategic goals of the Finnish donor co-operation.

Naturally, the work towards restoring a functional land administration in Cambodia has only just begun and the introduction of the covering land register is only a

part of it. The maintenance and updating of the records, for example, are challenging enough to organise feasibly. The cost recovery measures and partial or complete privatisation are seen as potential avenues for financing the land register in the future. The government is committed to a public sector reform following the principles of good governance, which is outmost important to all public functions. The land administration development work continues in Cambodia and there are still a lot to overcome, but the start is promising.

By the time of final editing of this article the government of Cambodia has indicated its commitment (Hun, 2000) to carry out the systematic registration nationwide, with the developed method, and invited donors to join the effort. In response, various donors have shown interest to its partial funding (CG, 2000) and among others, the World Bank (WB, 2000) has included land registration as a tentative loan program target, in the near future.

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