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THAILAND - LAND TITLING PROJECT

BY

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BACKGROUND

1. Thailand has an area of approximately 513,000 square kilometres and a population of 47.8 million, a high proportion of which (82.5%) is rural.

2. The agricultural sector currently employs over half of the labour force. It contributes nearly 30% of G.D.P. and accounts for 60% of Thailand's exports. Between 1960 and 1975, agricultural production grew at an average annual rate of 5%. This was based largely on expansion of the cultivated areas at an average of over 4% per annum. This pattern of growth now appears to be coming to an end and agricultural production in the second half of the 1970s grew at less than 4% per annum. Future growth will more and more have to depend on yield improvement and increased cropping intensity.

3. This question is addressed in the Royal Thai Government's Fifth National Economic and Social Development Plan (1982-1986) which introduced measures aimed at increasing productivity through further expansion of the infrastructure and improved efficiency in the use of land and water. In particular, it noted the need to:

"Speed up the distribution of land ownership through land reform and the provision of land titles for agricultural purposes in order to create employment security for farmers and eradicate social inequality. This will also benefit agricultural production."

Clearly, then, the availability of secure titles and the resulting access to bank finance for landholders is an essential element of Thailand's agricultural development.

4. A number of studies carried out in Thailand in recent years have highlighted the fact that only a small proportion of occupied agricultural land is held by title deed. The bulk is held under certificates of utilisation, is undocumented or is illegally occupied forest reserve.

DOCUMENTS EVIDENCING RIGHTS IN LAND

5. The Land Code, 1954 recognises two forms of document evidencing rights in land which are negotiable and can be registered:

(a) Title deed (chanod or NS4) - a certificate of ownership supported by a deed plan showing the position of boundaries surveyed by ground methods. (Figure 1); and
FIGURE 1: Title Deed - NS4

2.
(b) Certificate of utilisation - a certificate that the person named as owner has fulfilled certain conditions, particularly relating to occupation and utilisation of land. There are two forms of certificate according to the methods used for surveying the parcels:

i) nor sor sarm (NS3), where the certificates are issued on individual surveys which were not carried on any cadastral map. The issue of these certificates ceased in 1972.

ii) nor sor sarm kor (NS3K), where certificates are issued in general on 1:5000 scale photomaps based on unrectified aerial photography. (Figure 4)

Both certificates are supported by a deed plan showing the shape and size of the parcel. Both can be transferred, but proposed NS3 transfers must be advertised for 30 days before the transaction.

6. Both title deeds and certificates of utilisation are of similar form and are produced in duplicate with one copy being held by the owner and the other being retained in the provincial Land Office. All transfers and dealings must be recorded on both copies.

7. There are other forms of tenure in Thailand, but they are not negotiable.

8. The face of the title deed, for example, shows:

(a) the locality of the parcel by village, district and province;

(b) a reference to the cadastral map sheet;

(c) the title number and reference to the indexing system;

(d) the original owner and address;

(e) the area of the parcel; and

(f) a simple sketch showing the boundaries of the parcel.

On the reverse are recorded all subsequent dealings of the parcel. These are recorded by date and type of transaction, name of old and new owner if appropriate, area of existing parcel, area of new parcel if subdivided, number of new parcel if subdivided and signature of authorised Land officer.

9. Within each Land Office, there are other records which support the registration system, namely:

(a) a proprietorship index showing all registered proprietors in alphabetical order;

(b) a dealing file for each parcel/title which consolidates all dealings documents from the initial adjudication onwards in chronological order;
(c) a survey file containing all survey and subdivision information for each parcel; and

(d) a series of official cadastral plans.

10. Privately held land over which title deeds or certificates of utilisation have been issued comprises 26.3% of Thailand's area. A further 12.8% known as undocumented land is thought to be in the lawful possession of individuals. Particulars of areas and parcels are as follows:

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>AREA (million ha.)</th>
<th>PARCELS (million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Held by title deed (NS4)</td>
<td>3.0</td>
<td>3.7</td>
</tr>
<tr>
<td>Held by certificates of utilisation (NS3 and NS3K)</td>
<td>10.5</td>
<td>8.3</td>
</tr>
<tr>
<td>Undocumented land and land under restricted tenure (estimated)</td>
<td>6.6</td>
<td>5.3</td>
</tr>
<tr>
<td></td>
<td>20.1</td>
<td>17.3</td>
</tr>
</tbody>
</table>

11. A programme of issuing land titles to occupiers of privately held land (for which title deeds have not yet been issued) therefore involves about 13.6 million parcels covering an area of approximately 17.1 million hectares. The dimensions of the task become a little clearer when it is noted that title deeds have been issued in respect of about 3.7 million parcels to date.

LAND ADMINISTRATION

12. The major legislation dealing with land ownership and land administration in Thailand is the Land Code. It provides for the allocation of State land and land acquisition, the issue of documents evidencing rights in land, cadastral surveys and the operation of a title register. It defines controls on maximum land holdings by religious bodies, aliens and certain limited companies, partnerships or associations operated by aliens.

13. The Department of Lands is responsible for all aspects of land administration under the Land Code in respect of State lands (public domain) and private lands. By far the largest single responsibility is the cadastral survey and documentation of private lands and subsequent maintenance of the registers of these documents.

14. The Department is headed by the Director-General of Lands and is divided into five administrative areas, namely:

(a) land administration;
(b) general administration;
(c) technical planning;
(d) Surveyor-General's Office; and
(e) regional administration.
15. Department staff totals 10,775, which includes 655 graduates in law or political science and 20 in engineering and surveying. There are 1,682 holders of diplomas in surveying and 1,635 holders of surveying certificates. The regional administration consists of 72 provincial Land Offices and 674 district Land Offices. The staff of the provincial Land Offices totals 2,828 and of district Land Offices, 4,072.

DEVELOPMENT OF THE CADASTRAL SURVEY SYSTEM IN THAILAND

16. The Department of Lands first commenced carrying out cadastral surveys in 1903, using fully computational ground survey techniques based on co-ordinated traverse networks observed with theodolites and chains. In 1954, the first and second class cadastral surveys for land titles, described below, were introduced. The first class surveys were based on the previously adopted computational techniques. The second class surveys were introduced to speed up the process of issuing land titles. These surveys use graphical techniques in conjunction with the co-ordinated traverses. In 1962, the use of rectified aerial photomaps at a scale of 1:4000 was adopted for use with second class surveys to further increase productivity.

17. The surveys for NS3 certificates of utilisation were introduced in 1954 and were based on simple, isolated tape surveys. To increase the output of certificates of utilisation, the system of issuing NS3K certificates based on unrectified aerial photomaps at an approximate scale of 1:5000 was introduced in 1972. This last programme has been so successful that the Department of Lands has adjudicated, surveyed and issued over 7 million NS3K certificates for land parcels in the last 10 years.

18. The geodetic control network and basic topographic mapping in Thailand are the responsibility of the Royal Thai Survey Department (RTSD). The first order control network in Thailand presently consists of 362 triangulation stations, together with 200 first order traverse stations. The network includes 66 Laplace stations and 60 doppler satellite stations. The geodetic co-ordinates are based on a 1954 adjustment. For mapping, the RTSD uses the Universal Transverse Mercator projection, which covers Thailand with two zones. The country is covered by basic topographic mapping at 1:50,000 on a 15' x 15' format.

19. Since 1903, cadastral surveying and mapping has been based on 29 independent co-ordinate origins. The origins of these systems were originally trigonometric stations on the tops of mountains and pagodas, but in recent times the intersections of meridians of longitude and parallels of latitude have been adopted. The cadastral map sheets can be located on the 1:50,000 topographic map series. The relationship of the independent co-ordinate systems to the UTM system can be found by mathematical transformation. The co-ordinated cadastral control is generated outwards from the independent origins on a plane co-ordinate system. Control stations consisting of buried, numbered concrete monuments are placed about every 500 metres. Azimuth control is determined by solar observations about every 10 kilometres.

CADASTRAL SURVEYS FOR LAND TITLES (NS4)

20. As stated previously, there are two categories of cadastral surveys for land titles: first and second class. The majority of
existing first class surveys are in urban areas. Most individual surveys for subdivisions in urban areas, including Bangkok, are such surveys. First class surveys only amount to about 10% of systematic surveys for land titles. These systematic surveys are usually carried out in village and urban areas where there is sufficient cadastral control.

21. Systematic cadastral surveys are usually undertaken where it is intended to issue titles for at least 800 parcels. The field work is carried out by teams of surveyors and adjudicators based in Bangkok. Once a decision is made to prepare cadastral maps for the issue of land titles, an announcement is made in the Royal Gazette twelve months in advance. Notices are posted in the respective districts and villages thirty days before the survey.

22. The procedure for producing systematic first class surveys is as follows:

(a) boundaries are adjudicated, adjudication documents are signed by all adjoining owners and numbered concrete blocks (100mm x 500mm) are placed at each corner;

(b) all boundary corners are surveyed by radiation from the control traverse using theodolite and chain;

(c) all calculations are checked in the field. The final calculation is done in Bangkok, where the cadastral map is plotted by computer; an automatic flat-bed plotter has been used by the Department of Lands for this purpose since 1967 (see Figure 2); and

(d) the final plan is checked in the field; certificates of title are prepared and issued by a temporary field office set up for the systematic survey.

23. Second class surveys comprise approximately 90% of systematic surveys for land titles. Within this class, approximately 80% are based on rectified photomaps at 1:4000 in rural areas and 20% on traverse and tape surveys at 1:1000 in village and urban areas. The survey process based on rectified photomaps is as follows:

(a) photography is flown at 2300m with a wide angle camera, resulting in a photo scale of 1:15,000. The photography is flown with 2km between flight lines with 80% end lap and 42% side lap. No signalisation of boundaries or other control points is carried out in the field;

(b) four horizontal control points are determined by ground methods from the cadastral control. Occasionally, photogrammetric control is determined using aerotriangulation techniques - the Department owns the necessary equipment and has access to the latest block adjustment programme for this purpose;

(c) rectified photomaps are prepared at 1:4000 on a 500mm x 500mm format, representing 2km x 2km on the ground. It should be noted that virtually all legally developed
FIGURE 2: Cadastral Map for Land Titles by First Class Surveys and Plotted by Computer - Scale 1:4000
land in Thailand is relatively flat and is consequently ideally suited to the use of rectified photomaps; and

(d) the photomaps are used only for issuing land titles in those areas where the physical boundaries of each parcel are clearly visible on the photograph. In such cases, the adjudication process and marking of corners is as described previously. Boundaries are measured, but angles are not measured. In the presence of all adjoining owners, the boundaries are marked on the photomap and on a transparent overlay. Corners and corner numbers are also marked on the photomap (similar to Figure 4). Areas are determined graphically.

In locations where the boundaries are not visible from the photomap, the surveys are carried out based on the co-ordinated traverses, but only tapes and optical squares are used - sometimes only the tape is used where the triangle survey method is adopted. The cadastral map is plotted at 1:1000 to 1:4000, depending on the detail. Areas are calculated graphically (see Figure 3, showing this survey method for a subdivision). Individual surveys for updating the cadastral maps of land titles are carried out at the provincial Land Office. These offices usually have a large staff of surveyors who are mainly involved in performing surveys for the subdivision of land and the redefinition of boundaries.

CADAstral SURVEYS FOR CERTIFICATES OF UTILISATION

24. The issuing of certificates of utilisation (NS3) was phased out after 1972 in favour of the photogrammetric methods used for NS3K certificates. Adjudication of boundaries, measurement of boundaries (not angles), marking of corners and the preparation of certificates, however, was the same as the process for issuing NS3K documents. The major difference is that the boundaries of NS3 parcels are not charted or plotted on any overall plan; each parcel is measured in isolation. Along with NS3K documents and maps, all documents relating to NS3 certificates are kept in district Land Offices, as distinct from NS4 documents, which are kept in provincial Land Offices.

25. The vast majority of NS3K certificates are issued as a result of systematic survey. Approximately 80% of such certificates are issued on the basis of an enlarged aerial photograph at an approximate scale of 1:5000 - the same photography is used as for the issue of land titles. Each photomap covers an area of 2km x 2km, which can be located on the 1:50,000 topographic map series. As with land titles, the method is only used where boundaries are plainly evident on the photograph (see Figure 4). These systematic surveys are performed similarly to surveys for land titles. One difference is that it is the landholder's responsibility to mark boundary corners with wooden stakes or posts. In rice paddy areas the farmers rarely mark the corners, since they accept the dyke as the boundary. Also, they have seen the surveyor "measure" the boundary and mark the boundary on a transparent overlay of the photomap. Approximate areas are determined graphically.

26. In the 20% of cases where boundaries are not visible on the photomap (usually in villages), isolated ground surveys are carried out using tape methods only. The surveys are not based on any control. These surveys are related to the photomap by comparison of details on 8.
FIGURE 3: Subdivision Map for Land Titles prepared by Second Class Surveys - Scale 1:4000.
FIGURE 4: Photomap and Cadastral Overlay used to Issue NS3K Certificates of Utilisation - Approximate Scale 1:5000.

10.
photographs and on the ground to get position and shape of parcels. No theodolites or compasses are used; the map is simply built up by measured triangles (see Figure 5). All other procedures are as previously described. In the village areas, posts are usually placed at corners unless a physical monument already exists. These isolated surveys are plotted on transparent sheets, which are attached to the 1:5000 photomap on which they are located.

PROGRAMME AND PROCEDURES FOR CADAstral Mapping

27. As stated earlier, there are two cadastral map series in Thailand, namely, the 1:4000 scale cadastral maps for issue of titles and the 1:5000 scale unrectified photomap series for issue of certificates of utilisation (NS3K). The former series is based on the 29 independent origins (which have significant inconsistencies), and the latter is approximately related to UTM.

28. The Department of Lands now proposes a new 1:4000 scale series compiled from rectified aerial photographs and based on UTM. Eighty thousand such sheets are to be completed in a twenty-year programme of accelerated cadastral mapping. Some larger scale mapping of village areas also forms part of the programme. In parallel with this is the transfer of all registration of land titles from the provincial level to the district Land Offices. A first stage (five year) project has been planned and this is estimated to cost about £5 55 million. The Department of Lands currently has a capacity for producing about 1200 cadastral map sheets per year. The new programme, in which 4000 sheets are to be produced each year, will be heavily dependent on technology and it is planned to phase this in over the first five years of the programme.

29. The procedures in the new programme will include:

(a) aerial photography covering the areas to be mapped in the following year;

(b) major control surveys using doppler satellite positioning and EDM equipment. This will establish control in the areas to be mapped each year and will be connected to the Royal Thai Survey Department's national geodetic network;

(c) minor control for photogrammetric block adjustment;

(d) block adjustment to provide photogrammetric control for rectification;

(e) rectification at a scale of 1:4000 to produce photomaps based on UTM;

(f) ground survey, which will consist of adjudication, parcel surveys and preparation of an overlay of the rectified photographs showing particulars to be included on the cadastral map sheet;

(g) preparation of the cadastral map in a field office; and

(h) preparation and issue of new title deeds by the survey and adjudication team through the district Land Office.

11.
FIGURE 5: Isolated Cadastral Plan in a Village used to Issue NS3K Certificates of Utilisation - Approximate Scale 1:1250.
30. At the same time, a programme of map transformation of NS4 and NS3K surveys will also be undertaken. This will consist of:

(a) preparation of 1:4000 map sheets as previously described;
(b) transfer of NS4 and NS3K parcels to new cadastral sheets using digitising work stations; and
(c) renumber parcels and complete annotation.

31. The balance between the two components of the programme will vary. However, it is planned that at the end of the five year phasing in period, the total production will be about 4000 sheets per year.

32. To achieve the planned production, a programme of equipment procurement and training is planned. This will consist of the purchase of:

(a) 4 sets of doppler satellite positioning equipment and accessories;
(b) 60 sets of EDM equipment;
(c) 2 rectifiers and associated equipment;
(d) 2 point transfer devices;
(e) replacement of existing photo laboratory and printing equipment;
(f) 2 analytical plotters;
(g) 1 computer and peripherals;
(h) 2 flat-bed plotters and the necessary software;
(i) 7 digitising work stations;
(j) miscellaneous furniture and survey equipment; and
(k) 75 vehicles.

A new building is also proposed for the survey and mapping operation in Bangkok.

33. The Department of Lands is planning a comprehensive programme of training for staff who will be involved in procurement and operation of the new technology. It is expected that there will be extensive use of overseas consultants.

CONVERSION OF NS3K CERTIFICATES TO NS4 TITLES

34. As the cadastral map sheets become available, a programme of title issuance and conversion will commence. This will be carried out by teams from Bangkok out of district Land Offices. Conversion will consist of:

(a) transcription from the Land Office copy of the certificate of utilisation to a title deed form (NS4), details of the land, name and particulars of the owner and, in the index on the reverse, all transfers and subsisting entries which are still valid;
(b) the duplicate title deed will be prepared at the same time. A photocopy of the relevant extract from the map will be affixed to both the original and duplicate;

(c) the original and duplicate will be independently checked against the Land Office copy of the certificate;

(d) holders of the certificates will be summoned to bring their certificates to the district Land Office; and

(e) these will be checked against the Land Office copy and, if in accordance, the new title deeds will be handed over in exchange for the certificates and without payment of a fee.

URBAN MAPPING AND LAND VALUATION

35. There is an urgent need for a comprehensive programme of urban mapping in Thailand. Most of the existing maps are incomplete and out of date. Accordingly, the Department of Lands is currently examining a programme of urban mapping to be undertaken concurrently with the programme proposed for rural areas. It is intended that this will support the implementation of valuations and development of infrastructure in accordance with the present Five Year Plan.

36. Establishment of a Central Valuation Authority is also planned. In the long term, the role of the Authority will be to increase the efficiency of tax collection by providing accurate and complete information on values. The establishment of the Authority should provide land, property and annual values which are closer to market values, valuation rolls which will include all taxable land parcels and information which will be of assistance to public and private agencies.

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