

A NEW PLAN

of the

SETTLEMENTS

in
NEW SOUTH WALES,

taken by order of Government in 1856

Successive

Cow pasture plains

Some quarry Creek

Supposed course of Nopem

Blue Mountains

Ridges named the

Nopem River

South Creek

McIntyre

Georges R.

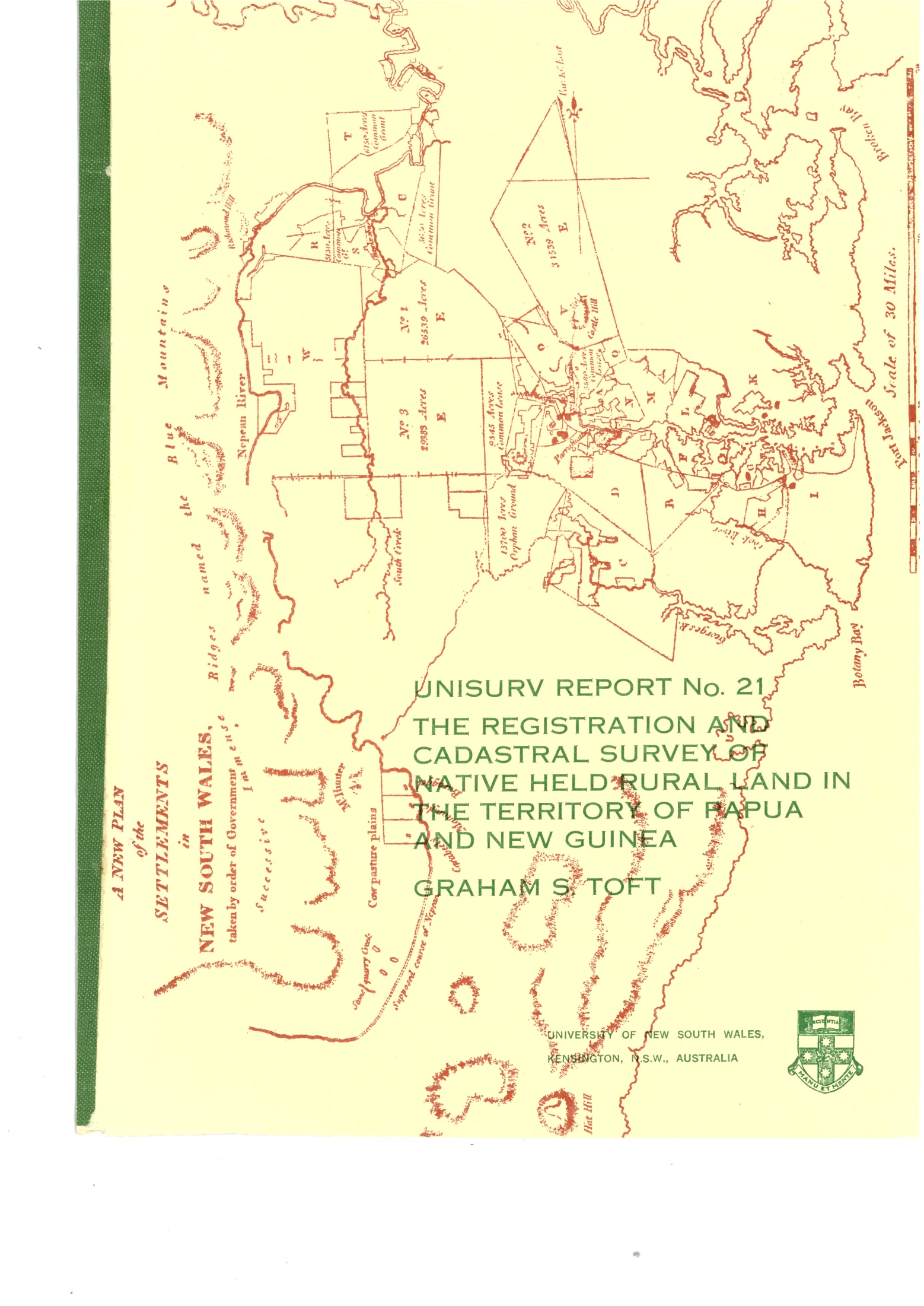
Botany Bay

Port Jackson

Scale of 30 Miles.

UNISURV REPORT No. 21
THE REGISTRATION AND
CADASTRAL SURVEY OF
NATIVE HELD RURAL LAND IN
THE TERRITORY OF PAPUA
AND NEW GUINEA
GRAHAM S. TOFT

UNIVERSITY OF NEW SOUTH WALES,
KENSINGTON, N.S.W., AUSTRALIA



Reference to Districts.

- A Northern Boundaries
- B Liberty Plains
- C Banks Town
- D Parramatta
- EEEE Ground reserved
for Govt. purposes
- F Concord
- G Petersham
- H Bulanaming
- I Sydney
- K Hunters Hills
- L Eastern Farms
- M Field of Mars
- N Ponds
- O Toongabbey
- P Prospect
- Q
- R Richmond Hill
- S Green Hills
- T Phillip
- U Nelson
- V Castle Hill
- W Evan

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London: Published by John Booth, Duke Street, Portland Place, July 20th, 1810

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THE REGISTRATION
AND
CADASTRAL SURVEY
OF
NATIVE HELD RURAL LAND
IN
THE TERRITORY OF PAPUA AND
NEW GUINEA

GRAHAM S. TOFT.

Thesis submitted for
Master of Surveying
Degree, University of
New South Wales.
October, 1968.

(i)

SUMMARY

Since World War II, several land registration measures affecting native held rural land have been introduced by the Administration of the Territory of Papua and New Guinea and some Local Government Councils. These have facilitated either the formalisation of customary land tenure systems or the rationalisation of customary land tenure into individualised tenure.

An evaluation of these measures and their implementation indicates a reoccurrence of the following inappropriate features:-

(i) Ill-adaption to the New Guinean culture and environment.

(ii) The inadequacy of administrative and technical machinery.

(iii) The non-existence of a universal, sound and properly regulated survey system.

(iv) The non-existence of a system of registered conveyancing for native held land.

The cause of these inappropriate features is usually traced back to the need for exigent decisions and/or the direct transplantation of Australian concepts, practices and institutions.

(ii)

A framework for a future workable system of native land registration and survey is devised in the light of the manpower and financial resources, the needs of the indigenous rural landholder, the general needs of a developing country, and fundamental registration and surveying principles.

(iii)

FOREWORD

In March, 1964, I informed the Department of Territories of the Australian Federal Government of my research interest in land registration and cadastral surveying. The Administrator of the Territory of Papua and New Guinea suggested through the Secretary for Territories in May, 1964, that consideration needed to be given to the system of title registration under the Land (Tenure Conversion) Ordinance and related surveying techniques.

Early research showed that the whole situation with respect to the cadastration of native held rural land in the Territory of Papua and New Guinea was vague, and that the problem as a whole needed clarification first.

Although this thesis is not as specifically directed as the Administrator originally suggested, I am sure that the general approach could well prove more valuable to decision makers.

The majority of the investigations were carried out between March, 1964 and March, 1966. Four months were spent in the Territory of Papua and New Guinea. Port Moresby, Popondetta, Rabaul and Lae were used as bases for data collection. The methodology of investigations is outlined in Appendix 8.

(iv)

I would like to acknowledge the assistance given me by the Department of Territories in making official files and documents available. Officers of the Administration of the Territory were very helpful, and it would be unfair to single out individuals.

I wish to thank Dr. R. Crocombe of the New Guinea Research Unit (Australian National University) for his advice, constructive criticism, and accommodation arrangements; the several private surveyors who gave of their time for valuable discussion; the New South Wales Department of Public Works for typing facilities; and the University of New South Wales for duplicating facilities.

I am particularly grateful for the thoughtful and constructive advice of my supervisor, Dr. P.V. Angus-Leppan, and the assistance and encouragement of my wife.

Lastly, I am indebted to the New South Wales Public Service Board for granting me two years leave to pursue this research.

g.s. toft.

October, 1968.

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CHAPTER I

INTRODUCTION

1. Definitions

Definitions of the following words in the title are:-

"Rural Land": All the land area in the Territory of Papua and New Guinea except those areas:-

- (i) declared or intended to be declared as towns under the Town Boundaries Ordinance 1951-52
- (ii) used as villages.

"Native"(Indigene): A person who is partly descended from an aboriginal inhabitant of the Territory, and who by virtue of that descent, acquires rights by native custom to or in respect of native land.

"Native Held Land": Land over which a native or group of natives hold a right or number of rights under any law in force in the Territory or under native custom.

2. Plan of the Main Text

The main text is presented in two sections.

The first section (Sec.2) describes the past and present situation with respect to the registration and cadastral survey of native held rural land. The section is principally a statement of facts. An analysis of these facts is made where appropriate in order to define current problems.

The second section (Sec.3) is a broad approach to the solution of the problems defined in Section 2. Concepts and practices which have been transplanted from Australia are evaluated in the light of the New Guinea culture. Recommendations of a very specific nature are avoided because of the need for pilot projects. Therefore a basic framework of concepts is constructed to serve as a "model" upon which further evaluation and experimentation can be carried out.

The evaluations which take place are based on the premises enumerated in the next chapter (Chapter 2). Justification for the adoption of these can be found in the references quoted.

The reader who is unfamiliar with the New Guinea scene is offered back-ground information in Chapter 3.

3. The Role of Land Registration in Land Reform

The World Bank Mission Report⁽¹⁾ states that "the best prospects for economic growth lie in the fields of agriculture and forestry". To improve agricultural production, reforms in the agrarian structure have and will continue to take place.

This thesis deals with an aspect of the agrarian structure often regarded as insignificant. The World

(1) Ref. 221

Bank Mission itself believes that local solutions to the problem of recording land would, given time, evolve and prove satisfactory: "The Mission suggests that a reasonable approach to the land tenure problem would be to place greater responsibility on the native people, including the Local Government Councils, to work out their own solutions adapted to varying circumstances. This approach would not make possible the recording of an individual title but at the same time would be no real disadvantage provided that comparable flexibility in approach could be achieved in regard to security for credits extended for assisting production by the indigenes" (1)

Almost every agrarian system has some form of land registration. However, many deficiencies in the agrarian structure can be remedied without interference to the land registration system. Such reforms include: reductions in the cost of goods and services; improvement in agricultural extension, marketing, processing and infrastructure. On the other hand a review of the adequacy of the land registration system may be necessary when the following reforms are contemplated: land fiscal reforms; reforms in tenure security; alterations to

(1) p.39 Ref.221

farm size and shape, analysis of the land use and ownership pattern prior to planned land settlement, etc.

If land registration does not perform a "service function" to facilitate economic and social activity it should be modified. The World Bank Mission could rightly see no need for a sophisticated, centrally controlled land registration system for rural land because its land development proposals included:-

(i) The limitation of formal land settlement schemes to trial cases only (1)

(ii) The gradual transition of subsistence gardens to market oriented commercial farming on village lands.(2)

(iii) The non use of native land in rural areas as a base for taxation.

On the other hand, the Department of Territories, through the Administration, has frequently included land registration measures in its land reform programmes. The appropriateness of these measures is the primary concern of this thesis.

(1) p.48 Ref.221

(2) p.79, 90-91, 98-99 Ref.221

GENERAL REFERENCES

CHAPTER 2

PREMISES

1. New Guinea

- .1 That relatively early self government is likely.
- .2 That a loss of expatriate technical and administrative know-how is likely prior to and after independence.
- .3 That although New Guinea will remain economically and technically dependent on developed nations, her technical and administrative operations will be carried out primarily by indigenes.
- .4 That Australia must make full use of the limited time to prepare the technical and administrative departments for independence in the following ways:
 - (i) Well considered, unambiguous policies.
 - (ii) Education and training of technologists, technicians and administrators.
 - (iii) Administrative framework in the technical departments should be established such that corruption will be minimised and public confidence in an indigenous Public Service maximised.
 - (iv) Optimisation of technical operations and methods so that maximum benefit may result from the finance and manpower expended.

2. Land Records

- .1 That the creation of a national land register is possible by sporadic and/or systematic determination of rights.
- .2 That the registration of land records (both of rights and of survey) is a service operated by the government according to modern management principles.
- .3 That the system of conveying land should be as simple as possible in developing countries.
- .4 That the land registration system can be adapted to suit any system of land tenure.
- .5 That the cost of implementation and maintenance of a particular land registration system must, inter alia, be considered in the light of the use and value of the land, (both present and anticipated).
- .6 That the uses to which the cadastral registers will be put determines the type and format of the registers and the accuracy of the cadastral survey.

3. Reasons for the Implementation of a Land Registration System.

- .1 That the cost of cadastration to the public sector of the economy is great both in terms of finance and technical manpower. Costs are recurrent because the success of the registers depends on their being kept

up-to-date.

That, therefore, the value of a cadastre can best be assessed in terms of monetary return to the economy for the capital investment incurred, with due consideration to social benefits.

- .2 That it is beyond the scope of this thesis to assess the monetary return to the economy of the land registration system.
- .3 That, for purposes of this thesis, the introduction or existence of a cadastre can be justified by the type and extent of uses to which it is put.
- .4 That possible uses of cadastral registers are:-
 - (i) Fiscal - Cadastral registers are "the backbone of the system of administration of land taxes" (1)
Registers need to provide the following information -
 - (a) location and boundaries of taxable properties,
 - (b) names and addresses of liable taxpayers,
 - (c) information with respect to the assessment of land value for taxation purposes (e.g. soil classification, irrigation, methods of cultivation, crops grown, volumes and value of production.)

(1) p.45, Ref. 210

(ii) Juridical - Registers can be regarded as legal documents which enable security of tenure and protection of the individual's rights and obligations. Registers can particularly protect the rightholders whose employment necessitates absence from their community.

(iii) Consolidation of Uneconomic Holdings and Redesign of Farm Layout - Registers of rights and land parcels are needed before and after consolidation.

(iv) Availability of Credit at Low Interest - Security of tenure based on sound records is necessary for mortgaging at low interest.

(v) Planning of Land Reform - A knowledge of the ownership, occupance and use patterns is necessary before land reform can be scientifically planned. Analysis of the land use pattern and its correlation with physical, economic and social factors is particularly important prior to reform. Land reform is frequently based on ideology rather than analysis of data.

In the case of planned land settlement, the Government knows from the cadastral records with whom to negotiate upon selection of the most suitable land.⁽¹⁾

(1) At present in Papua and New Guinea the Administration's method is to buy land offered by clans. It is not able to barter for better quality land because it does not know where all the clan land is.

(vi) Use of Cadastral Data for "Feedback"

Frequently the results of a land reform programme cannot be assessed because of the dearth of "feedback" data. "Feedback" can take two forms:-

- (a) directly from farmer to low level bureaucrat.
- (b) impersonal statistical data - cadastral registers can be of value here, if kept up-to-date.

(vii) Planning in Other Sectors of the Economy.

Registers are needed in Town Planning, mineral exploitation, Public Works projects, Communication and Traffic Planning, etc.

(viii) Land Valuation. Considerable expense and time is involved in the valuation of rural lands in developing countries. The appraiser's task can often be carried out at Head Office if the cadastral maps are kept up-to-date, and show the detail necessary for valuation.

(ix) Statistical. Cadastral registers can provide statistical data relating to farm tenancy, farm size, productivity, urban mobility, etc.

(x) Registered Conveyancing can be used to prevent fragmentation and subdivision of farms provided that:-

- (a) registered titles only are valid.
- (b) titles can only be registered upon compliance with fragmentation and subdivision requirements.

(xi) Land Tenure Reform Land registration can be used to solidify land tenure reform by making the benefits of registration only available to certain tenurial arrangements.

(xii) Educational Program. Decentralised land registries can be used in the educational programme associated with land reform.

(xiii) Maintenance of Law and Order. Cadastral registers can be used in the solution of land disputes between individuals and communities.

(xiv) Public Land Administration Generally.

"Cadastral surveys have an important function with regard to virtually every branch of public service connected with the land" (1)

The needs, rights and obligations with respect to the land of government, group and individual can only satisfactorily be attended to with the aid of cadastral records.

GENERAL REFERENCES

22, 57, 74, 74, 80, 86, 87, 96, 103, 104, 112, 145, 147, 158, 197, 201, 210, 221, 224, 231.

(1) p.46, Ref.210

CHAPTER 3

NEW GUINEA BACKGROUND

This chapter is designed to give the reader sufficient background of the New Guinea situation for him to appreciate matters raised in the main text.

1. HISTORY

Territory of Papua

- | | |
|------|--|
| 1884 | British Protectorate proclaimed - called "British New Guinea" |
| 1888 | Annexed outright - became British possession |
| 1906 | Australian administration began - henceforth called "Papua" |
| 1942 | Japanese invasion, civil administration suspended. Australian military Government administered areas not occupied by the Japanese. |
| 1945 | Surrender of Japanese, civil administration restored. |
| 1949 | Government of both territories joined in an administrative union known as the Territory of Papua and New Guinea. |

Territory of New Guinea

- 1884 German Protectorate proclaimed
- 1885 Annexation by Germany sovereign rights
delegated to the German New Guinea Company.
- 1889 German Empire took back sovereign rights from
the Company.
- 1914 Occupation by Australian troops. British
Military Administration.
- 1920 Mandate for administration of the Territory
given to Australia by the League of Nations.
- 1942 Occupation by Japanese troops.
- 1944-45 Australian Military Administration.
- 1946 Australian Civil Administration
- 1949 Administrative union with the Territory of
Papua.

2. POPULATION AND CULTURES

- 1.3% population embraces western (Australian) culture.
- 0.2% population embraces expatriate Chinese culture.
- 98% population embraces primitive cultures in a state
of flux due to influence of capitalism and
western ethics.
- 0.5% population cannot be classified as belonging to
any particular culture (1).

(1) Ref. 74.

3. EMPLOYMENT OF INDIGENES IN PUBLIC SERVICE

- 1957 Creation of an Auxiliary Division to provide a training ground through which members of the indigenous population could progress to other divisions of the Service.
- 1963 Abolition of all positions in Auxiliary Division. Absorption of Auxiliary Division officers into Third Division. Differing rates of pay for local and expatriate officers in all Divisions.

4. FISCAL POLICY

Prior to World

War II Head tax for males in both Territories.

1949 Native Local Government Council personal tax permissible.

1958 Personal taxation - all males 18 years and over.

1959 Taxation on income, applicable to individuals and companies.

1964 World Bank Mission recommended urban land tax on both freehold and native owned land.)⁽¹⁾
Local Government Ordinance 1963 gave power to Local Government Councils to impose land tax.⁽¹⁾

(1) pp 399, 406 Ref. 221.

5. ADVANCEMENT OF INDIGENOUS PEOPLE

Prior to World War II

Australia's primary interest in the Territories was defence.

The Territories were separately administered by direct rule. Indigenous participation in government was insignificant. It consisted of election of native village councillors to assist local officials appointed by the Administration. The local councils had no financial powers and little authority.

An attitude of "benevolent paternalism"

pervaded native administration. Expatriate interests were looked after but native advancement, particularly in the fields of education, politics and cash cropping, was not stimulated. Little was done to make the Territories economically viable.

Post World War II

Australia committed herself to the political, economic, social, and educational advancement of the indigenous people.

There has been a marked expansion in the Territory's Public Service.

Indigenous people have been given increased opportunity to participate in government through:

- (i) increased representation in the legislature.
- (ii) Local Government Councils.
- (iii) an increased role in the Administration because of the expansion of educational facilities and the creation of positions in the Public Service.

Heavy emphasis has been placed on education, health and the development of a new native economy based on cash cropping. Limited credit facilities were made available to native farmers under the Ex-Serviceman's Credit Scheme (1958-1962) and Native Loans Fund, 1955. Rural Progress Societies, Co-operative Societies, Savings and Loans Societies have been introduced to facilitate native economic activity.

Within a short period of twenty years much of the native population has been or is being thrust into an environment of rapid economic, cultural and technical change.

6. CUSTOMARY LAND TENURE AND AGRICULTURE

- .1 The customary method of land use is based on shifting subsistence agriculture. Land resources are used only for annual subsistence. They are not used for the production of excess and the accumulation of capital.

- .2 The tenurial system is closely related to this agricultural method.
- .3 The tenurial system is also closely linked with the work organisation of traditional society. This is based on kinship, marriage and descent in varying forms and degrees. Each different socio-political system has its corresponding land tenure system. P. Lawrence ⁽¹⁾ suggests eight major socio-political systems in Papua New Guinea. Therefore it is almost impossible to generalise about land tenure systems in the Territory. The description in .4 will suffice.
- .4 Land may be controlled on a tribal, village, kindred or family basis. The normal unit which controls the land is the clan or lineage. A complex set of rights and obligations with respect to the land are distributed amongst the individuals of the group according to status, sex. etc.

The individual has a certain number of rights and obligations by virtue of the groups' laws concerning

(1) Ref. 125

- (i) descent and inheritance and
- (ii) residence on group land.

The rights are usufructuary rather than absolute. However some individuals may hold certain rights of control and disposal. Most frequently, the individual holds rights of direct and indirect use. Common usufructuary rights are, the right to erect a dwelling, the right to hunt, cultivate, collect water, gather food and the right of access.

Tenure security is high under the customary land tenure system because group membership guarantees the individual certain rights regardless of residence.

Obligations are generally social and usufructuary. Primitive soil conservation measures and the distribution of food to those in need are common obligations placed upon those who exercise their cultivation rights.

For the sake of clarity the term "communal tenure" is avoided where possible in this thesis because it implies that all rights and obligations are held and discharged by the group as a whole. This is far from the truth. (See Glossary).

7. TRADITIONAL LAND REGISTRATION

The traditional system of recording land rights and obligations is the "public memory system". The fact that land disputes are not uncommon in traditional village life indicates that this system has its shortcomings. The system appears to work best where the community size is small and there is an abundance of land.

An elementary system of tangible records was developed on Wogeo Island, one the largest of the Schouten Islands Group. There, each series of land parcels is associated with a particular rafter in the roofs of village houses.

When a new house is built each adult male provides and fastens a rafter to indicate his rights.

8. CHANGES IN CUSTOMARY LAND TENURE AND AGRICULTURE

Rapid changes have been taking place in native agriculture.

Major influences include:-

- (i) The introduction of cash cropping,
- (ii) the introduction of new crops and methods,
- (iii) movement of rural labour to urban centres,
- (iv) land alienation by the Administration
(minimising the area under shifting cultivation),
- (v) improved infrastructure,

- (vi) breakdown of religious sanctions with respect to land.

In many cases the customary land tenure system has proved inadequate for the new agricultural circumstances. This problem is so common to the Pacific area that in 1964 the South Pacific Commission obtained the services of an expert to make a regional survey of the problems of adapting customary land tenure systems to economic conditions (1).

The most widespread problem has been associated with perennial crops which are the mainstay of the export market. The fruits of these crops are not the sole property of the planter. Other group members may hold rights of harvest. Consequently, many an enterprising planter has been disillusioned.

On the other hand, customary land tenure practice has commonly been found suitable for pasturage and annual cash cropping for local markets.

There are those who support the thesis that customary land tenure arrangements can be adapted to meet new forms of agriculture and work organisation. The World Bank Mission held this view when it recommended "village concentration units" for cash cropping.

(1) South Pacific Commission : 26th Session, Noumea
14-26/10/64 Proceedings Paragraph 34 (b)

Native groups were to be encouraged "to work out their own solutions to obtaining individual ownership or control of land within native customs" (1) There is evidence to substantiate this viewpoint: "Available data suggests that communal systems of land tenure in Africa have not proved themselves so inflexible as to prevent adaptation to new conditions" (2).

The Administration, on the other hand, has held that the best form of tenure for agriculture in Papua and New Guinea is the individual family farm unit. To this end the Administration is providing natives with "individual tenure" either by leasehold of a Land Settlement block or by freehold of a "tenure converted" block. The World Bank Mission considers this policy will not provide sufficiently rapid progress in agricultural output (3).

The exclusive use of either of the above tenurial solutions may not necessarily optimise agricultural output. The most satisfactory tenure arrangements may depend on local circumstances. The New Guinea Research Unit of the Australian National University is currently conducting research into this question.

(1) p 176 Ref. 221

(2) p 28 Ref. 201

(3) p 175 Ref. 221

9. LAND DISPUTES AND LAND POLICY

The most important land transfer custom in the pre-contact era was warfare. By this process tribal territorial limits tended to fluctuate with population changes. Upon pacification the territorial boundaries tended to be solidified. In the interim period population changes have brought about some imbalance. In some cases natives have arranged transfers. Unfortunately, facilities for the transfer of rights between clans and individuals have not been provided by the Administration.

Land disputes between natives, particularly over boundaries, continue at an alarming rate. A Native Land Commission was set up in 1952 to determine land claims. This was replaced by the Land Titles Commission in 1962. By September 1964, 1476 claims were awaiting settlement by the Land Titles Commission of which an estimated 25% would be disputed. The estimated time required by the Commission to settle these claims was no less than two to three years, probably more". (1)

(1) House of Assembly Debates : Vol 1, No. 2 1st-10th
September, 1964.

In addition, natives have increasingly disputed the title over alienated land, including parts of towns, European held plantations and mission property.

The following statement by Mr. Toliman, M.H.A. indicates the position in the Gazelle Peninsula.

"Everywhere in the Gazelle area the Tolai people are complaining about land which was not bought by the early settlers and which has been handed down to the present time. Today the land is coconut plantations. Many land disputes were referred to the Government years ago and the people are still impatiently awaiting the result of their cases. There is pressure by the growing population in the Gazelle area for expansion of their villages for the coming generation" (1)

The whole question of land administration and policy is controversial. The following statements from the House of Assembly indicate the extent of the controversy and the associated emotionalism:-

"I think the whole Land Ordinance should be thrown out and a completely new one written. The system we work under at the moment except for making the Administration the biggest landlord in the world, serves no other purpose.

(1) House of Assembly Debates : Vol. 1, No. 5, 5th Meeting of 1st Session, 17th-24th May, 1965, P637.

In the Sepik there are many native people who are very dissatisfied with the system under which they are not permitted to even lease to a person of their choice a piece of land, without the Government stepping in and either buying it or putting it up for tender" (1)

"I believe that the regulations under the Land Ordinance at the moment are far too light and far too easy on those persons who hold land" (2)

"It is on the question of land tenure, that the success of the Australian Administration within the Territory of Papua and New Guinea depends. I further reiterate that this particular question of land tenure has been in the "too hard" file for too long" (3)

"Failure to restore title, or more specifically, to deal with disputes over the restoration of titles has caused much discontent". (4)

-
- (1) Mr. Martin : House of Assembly Debates ;
Vol 1, No. 2 1st-10th September, 1964 P 154.
- (2) Mr. Downs. House of Assembly Debates,
Vol 1, No. 2, 1st-10th September, 1964.
- (3) Mr. Neville. House of Assembly Debates,
Vol 1, No. 4, 5th Meeting 1st Session 17-24th May,
1965 P637.
- (4) Mr. Zure Makili Zurecnuoc, House of Assembly Debates,
Vol, 1 No. 5, 5th Meeting 1st Session 17-24th May,
1965 P641.

10. RESEARCH

Research has been particularly active in the fields of the social, physical and biological Sciences (1)

Research into the application of the engineering and management sciences to facilitate economic development has been sadly deficient to date.

GENERAL REFERENCES

5, 13, 21, 23, 30, 35, 36, 37, 38, 42, 44, 49, 53, 54, 63, 65, 75, 83, 84, 85, 86, 88, 91, 96, 102, 111, 112, 125, 127, 135, 140, 148, 158, 163, 167, 168, 172, 173, 181, 186, 195.

(1) Ref. 183, 184, 150

SECTION 2

COMMENTARY

ON

THE REGISTRATION AND SURVEY

OF

NATIVE HELD RURAL LAND

CHAPTER 4

BACKGROUND TO LAND POLICY AND LAND SETTLEMENT

1. PAPUA 1884-1942

Basic policy with respect to native rights over land was made by Commodore J.E. Erskine when he proclaimed British New Guinea as a Protectorate in 1884.

" your lands will be secured to you"

Papua is one of the few colonies where native rights have not been severely affected by European settlement. The state of the Crown Grant Register indicates the few freehold titles which were issued prior to the cessation of freehold alienation early this century. (see Table I).

The Land Ordinance of 1906 clearly established respect for native land ownership and the impossibility of acquisition from the natives except via the Administration (I)

Crown leases were limited to 99 years.

Rubber was the most widespread plantation crop.

2. NEW GUINEA 1884-1920

Prior to the German declaration of a Protectorate in 1884 pioneer settlers and missionaries had purchased

(I) Land Ordinance 1906 (No. 5 of 1906) Sec. 3.

some land from the natives. From 1884 to 1902 native land interests were not closely guarded. Large freehold tracts were acquired, particularly by the New Guinea Company.

After 1902 the German Administration protected native lands from indiscriminate exploitation and expropriation. (1) It appears that the intention of the German Government was that acquisition of native land could not even occur against natives by prescription. (2)

By 1914 the total area alienated from natives was 702,000 acres. (3)

The Commonwealth Year Book 1920 put the figure at 499,511 acres, but it is not clear whether this figure refers to the total land alienated from natives or the total alienated by the German Authorities.

(1) Sec. 1, Sec 2 (2) Ref. 225

(2) Ref. 161

(3) Ref. 195

The majority of this was freehold tenure as the German Administration did not lease from natives for release to non-native interests and did not encourage direct leasing between native and lessee.(1)

Agricultural development was carried out by German Companies and private planters. Copra was the primary export.

Planation land was selected not so much for soil suitability but for access to transport facilities. (anchorage for coastal shipping). (2)

The British Military Administration (1914-1920) adopted a land policy in keeping with the German land policy.

3. NEW GUINEA 1920-1942

In 1920 the New Guinea Expropriation Board took control of all German commercial and planting interests. The German owner's right of possession was changed to a right of compensation. The majority of agricultural enterprises were taken over by Australian returned soldiers.(3)

(1) Sec. 5 Ref. 225

(2) Ref. 196

(3) Sale of Expropriated Territories 1925

The Land Ordinance of 1922 brought New Guinean land policy basically in line with Papuan land policy. However, freehold title could be granted in New Guinea by the Governor General of Australia but policy has been to grant leaseholds only.

Further land settlement was slow. Tenure was in the form of 99 year leaseholds over virgin land. Lessees were predominantly returned soldiers.

The price slump in copra in 1926 followed by the economic depression of the 1930's caused many plantations to be taken over by companies. It is generally considered that this led to a lower level in efficiency and production.

4. PAPUA AND N'W GUINEA 1945 TO DATE

Believing that the development of the agricultural resources of Papua and New Guinea could only be stimulated through European private enterprise, the Australian Government showed an increasing interest in the expansion of European settlement. Considerable areas were leased as agricultural holdings and became individually owned and operated plantations. New crops such as cocoa and coffee were planted.

Until the early 1950's, policy had been that the European settler applied to the Administration for a lease over a particular tract. The Administration would then negotiate a purchase with local natives and, if successful, lease the land to the applicant. By 1950 the Australian concept of planned land settlement (commonly known as "Closer Settlement") had found favour. The Administration proposed to acquire tracts of accessible land for development, subdivide them into suitable sizes, then advertise for applications.

Support for this scheme was not unanimous. For example, James McAuley (1) put forward social, political, labour, land use and land availability problems associated with the scheme.

By 1958 the Administration was forced to implement the scheme because of:-

- (i) Increasing urgency of creating economic viability.
- (ii) In 1956-57 many planters suffered financial difficulty which led to a considerable number of company takeovers. It was feared that company management would adversely

(1) Ref. 132

affect production rates and create an unsatisfactory political environment.

In 1958 the Ex-Servicemens' Credit Ordinance was gazetted and the Department of Lands, Surveys and Mines set up a Land Settlement Division to investigate and subdivide land. Thus planned land development and credit became available. The Ex-Servicemens' Credit Scheme closed in November, 1962.

In 1959 land was advertised for lease in the Popondetta area of Northern District and in the Worangoi Valley in New Britain. Since then the Administration has made planned land settlement a main arm of its economic development programme.

In the 5 year period 1962/63 to 1966/67 a target of 7,500 blocks has been set (1). This will involve the investigation and subdivision of an estimated 249,480 acres (2).

(1) Department of Lands, Surveys and Mines :
Land Settlement Planning File.

(2) 7,500 blocks : 189,000 acres + 10% subdivision
wastage = 207,900 acres + 20% unsuitable
topography = 249,480 acres.

The trend has been away from schemes of European large holdings to those of native small holdings.

Reasons are numerous:-

- (1) The tenure of Crown/Administration leases is 99 years. Upon expiration of the lease the value of improvements is repaid to the outgoing tenant. However, the good faith of a future indigenous government is doubted by some Europeans.
- (ii) The unstable political environment and uncertainty about future recognition of Europeans.
- (iii) European investments must be capitalised quickly due to political insecurity. This is not possible with tropical agriculture (1)
- (iv) The availability of native plantation labour.

(1) Copra, cocoa, rubber and coffee plantation production all require large capital outlay and long waiting period for returns.

(v) The need for native agricultural development.

Initially, areas of previously acquired Administration/Crown land were subdivided. The usable portion of this land has now almost been exhausted. Hence, the Administration has embarked on a large-scale programme of purchase and lease of native land. This involves a considerable capital outlay under present land acquisition procedures. For example, in the financial year 1965/66 a vote of \$337,000 was made for the purchase or lease of an estimated 66,000 acres for land settlement (1)(i.e.\$5.1 per acre).

5. PLANNED LAND DEVELOPMENT

The pattern of land development up to 1942 was very haphazard. Just prior to its defeat in the Federal Elections, the Labour Government was in the process of establishing a Land Development Corporation, the purpose of which was to secure planned control and development of all land in Papua and New Guinea. Draft legislation was drawn up in November, 1947.

(1) Department of Lands, Surveys and Mines Vote
31.1.5 Purchase and Lease of Land 1965/66.

In 1954, the Land Development Board was set up. Its members are the Assistant Administrator (Economic Affairs); Director of Lands, Surveys and Mines; Director of District Administration; Director of Agriculture, Stock and Fisheries; Director of Forests; Director of Public Works and the Executive Officer (Policy and Planning) of the Department of the Administrator.

The Board is a non-statutory body. It serves as adviser to the Administrator on the following matters:-

- (i) All matters connected with land settlement and sub-divisional survey.
- (ii) Drafting an annual programme for reconnaissance and sub-divisional surveys.
- (iii) Determining a land use plan for all Administration land and land in the process of being acquired by the Administration.

Up to 1965 land settlement priorities had been determined largely on the availability of previously acquired Administration/Crown land. The Land Development Board has now recommended a priorities approach based on the concentration of resources. (A principle expounded in the World Bank Mission Report).

6. LAND AQUISITION

The conflict between protecting native rights to land and promoting rapid economic development has become more pronounced in recent years. Economic viability is now such a priority that the natives' wishes cannot always be met. To this end the Land Ordinance of 1962 provides for a method of acquisition by compulsory process.

Acquisition to the Administration/Crown by transfer or lease is now possible by:-

- (i) Agreement
- (ii) Compulsory process

Under (i) the Administrator, through the Department of Lands, Surveys and Mines, must be satisfied that the land is not required by the owner or future owners for the period of the lease or permanently.

Under (ii) the Administrator may declare land, acquired by compulsory process "for a public purpose specified". (2). The native interests in the land are converted into rights of compensation at the date of acquisition.

(1) Land Ordinance 1962, Sec. 16

(2) Land Ordinance 1962, Sec. 18 (1)

7. THE MEANING OF "LAND"

It is important to note that the western concepts of "land" have been transplanted in the land laws and policy of Papua and New Guinea. Several of these concepts differ from the native concepts of "land".

One important variation is with respect to the Latin maxim "QUICQUID PLANTATUR SOLO, SOLO CEDIT" which means that anything attached to the land, or growing on it, forms part of it. Both natural and artificial things which are fixed to the soil, either directly or indirectly are considered part of "land" and are transferred with the land without express mention. (1)

In contradistinction, in most New Guinean cultures rights over the use and transfer of fixtures (especially economic trees) are distinct from the rights over the soil itself.

A second variation is associated with the concepts of sale. "It is, however, always difficult for a native of New Guinea to understand that he is selling the land

(1) Natural and artificial features may, however, be expressly excepted or granted separately from the land.

outright. He is inclined to look on the purchase money as rent paid for the right to use the land; often he believes that this right is contingent on the land being kept in cultivation, and that it extends only to such areas of the land as are actually cleared or planted"(1)

GENERAL REFERENCES

36, 120, 121, 132, 135, 136, 161, 167, 185, 191, 192, 193, 225.

(1) Ref. 136

CHAPTER 5

BACKGROUND TO LAND REGISTRATION AND CONVEYANCING
(WITH PARTICULAR REFERENCE TO NATIVE LAND)

1. Land Registration and Conveyancing Measures. (1)

Each Territory still has separate legal systems and retains the body of law, subject to repeal and amendment, it had prior to Administrative Union. Since 1951 serious attempts have been made to draft common legislation for both Territories and amalgamate existing legislation. (2).

.1 Land Ordinances (Administered by D.L.S.M.)

There are only two ways of holding land in Papua and New Guinea (L.O.Sec. 7 (2)):-

- (i) under the Administration
- (ii) under native customary rights.

The Land Ordinances relate to the tenure, administration and dealings of Administration/Crown land. (3). They are not specifically land registration ordinances but have much to say about the conveyancing of Administration/Crown land.

(1) Refer also Fig.4.

(2) Ref. 140

(3) Administration land is land acquired from natives by the Administration in the Trust Territory of New Guinea. Crown land is land acquired from natives by the Administration in the British Territory of Papua.

The Land Ordinance (Papua) 1911-1961 and the Land Ordinance (New Guinea) 1922-1961 have been repealed and replaced by the Land Ordinance of Papua and New Guinea, 1962.

.2 Papua : Real Property Ordinance (Administered by R.of F.)

The law of the Territory of Papua can usually be traced back to Queensland law.

By the time Papua was declared a British Protectorate, the Queensland Real Property Act (1861) had proved its worth and was adopted in Papua. The dual statutory registration systems in the Australian States were avoided. However, private conveyancing under common law would be quite legitimate.

Registration of Title Laws in the Territory of Papua:-

- (i) Real Property Act, 1861, 25 Vic. No.14 (Qld. adopted)
- (ii) Real Property Act, 1877, 41 Vic. No.13 (Qld adopted)
- (iii) Real Property Ordinance, 1889, No.1, 1889. (Legislative Council)
- (iv) The Registrar of Titles Ordinance, 1903, No.5.
1903 (Legislative Council)
- (v) Real Property Ordinance, 1913. No.13, 1913
(Legislative Council) (A consolidation of (i) -- (iv) and amendments).
- (vi) Real Property Ordinance as amended 1913 to date.

The Ordinance has only applied to land alienated or leased from the Crown until the introduction of the Land (Tenure Conversion) Ordinance.

See Table 1 for list of titles registered under the Real Property Ordinance.

.3 New Guinea:

Grundbuch System (Administered by County Judges and the R. of F.)

Land Registration Ordinance (Administered by the R of F)

In July, 1887 regulations were issued for the institution of a Grundbuch system (1) of land registration. Grundbuch districts were defined and Grundbuchs opened. The system was administered under Prussian Law, especially the Prussian Land Statute of 5/5/1872.

When the German Government took back sovereign rights from the New Guinea Company, the colony became subject to the German Civil Code which perpetuated the Grundbuch system.

The British Military Administration adopted German land policy and kept German administrative machinery going during World War I. (2) (3).

The New Guinea Act 1920 and the Laws Repeal and Adopting Ordinance 1921 preserved the rights, titles,

(1) See Glossary for Definition

(2) Ref.136

(3) Ref.161

obligations and liabilities already acquired, accrued or incurred over land in German New Guinea. In 1924 the method of registering the above was changed by the Land Registration Ordinance. This Ordinance enforced a change from the Prussian Registration of Title system to the Australian Registration of Title system. All land and rights in land registered or in the process of registration in the Grundbuch were to be examined and re-registered in the Torrens Register.

Similar changes were made in land registration laws when other German colonies changed hands at the end of World War 1. For example, Tanzania had been under the Prussian land law since 1902. Great Britain decided that "to adopt the cumbrous English system would be retrograde". In consequence a home tailored land registration Act based partly on the Australian Torrens Acts and partly on the English Land Transfer Acts replaced the Grundbuch system.(1).

Only land alienated or leased from the Administration has been registered under the Ordinance until the recent Land (Tenure Conversion) Ordinance. It is the intention of the Administration to amalgamate the Land Registration Ordinance and the Real Property Ordinance into a single Ordinance for the whole Territory.

(1) Ref. 178

See Table I for an account of titles registered under the Land Registration Ordinance.

.4 Native Land Registration Ordinance 1952
(Administered by N.L.C.)

Upon committing itself to a policy of expanded European land settlement (Ch 4 Part 4), the Department of Territories held that "..... there is much more cultivable land in the Territory than the natives could possibly require for their farming purposes, even were their numbers greatly increased, and there is plenty of land that can be made available for European settlement without in any way interfering with the land interests of the native population" (1). A plan was drawn up to investigate land holdings of natives "with a view to determining what future areas could be made available for non-native development without injury to the natives". (2).

"A pre-requisite to all land use planning is a determination of the land, the residual interests in which belong to natives - whether they be tribes, clans or individuals - and the determination of waste land which the Government may declare as Government land and dispose of under the ordinary land laws".(3).

(1) Ref.120

(2) Ref.135

(3) Ref.121

The function of the Native Land Commission was to

- (i) identify ownership of each tract of land in the Territory
- (ii) register that ownership with the Registrar of Titles so as to establish a title.(1).

The function of the Department of Lands, Surveys and Mines was to take possession of ownerless land as the work progressed. (2).

Although the Department of Territories was confident that considerable areas of waste and vacant land would be uncovered, (3), anthropologists were generally of the opinion that there was no usable land in the Territory over which some sort of native title did not extend.(4).

The legislative provisions for this policy were enacted in 1951 in the Native Land Registration Ordinance of 1951. This Ordinance was not brought into operation. It was replaced by an almost identical ordinance: the Native Land Registration Ordinance No.75 of 1952. The Native Land Registration Regulations and the Native Land Commission Rules were also introduced in 1952. The Chief Commissioner of the Native Land Commission started work in July, 1952.

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- (1) Ref. 85
 - (2) A.R. (N.G.) 1953-4
 - (3) Ref.132
 - (4) Ref.192

Progress was inordinately slow. By May, 1953 two disputes had been decided (1). Only five disputes had been settled in the first five years of the Native Land Commission's activity in the Northern District.(2). Only forty six findings were ever received by the Registrar of Titles and none of these were registered.

.5 New Guinea Land Titles Restoration Ordinance
(Previously administered by the Commissioner of Titles.
Now administered by the Land Titles Commission).

The titles destroyed during the Japanese occupation are listed in Table 3.

Upon re-establishment of civil administration in 1946, interim measures were enacted to enable dealings in land to proceed where duplicate Certificates of Title were available. These measures were:-

Reg. 21A, National Security (External Territories)
Regulations and Lost Registers Ordinance. (Papua and New Guinea) 1950.

(1) L.C. Debates, 4-8 May, 1953

(2) CROCOLMBE, R "Land Tenure Research in Papua and New Guinea". Article in Ref. 135.

In 1951, the New Guinea Land Titles Restoration Ordinance (No.10 of 1951) was enacted to re-establish the Certificate of Title, Administrative Lease, Mining and Forestry Registers.

A Commissioner of Titles was appointed to adjudicate on and to re-establish interests in land.

The Registrar of Titles was appointed to recompile the registers.

The process of restoration has been slow and a heavy drain on title and survey staffs. The total number of final orders at 17/11/65 was 1350. Of these only 953 (1) had been registered. The remainder awaited survey or appeal hearing at the Supreme Court. This is only just over 50% of titles in the original Certificate of Titles and Administrative Lease Registers. However, this covers the majority of important parcels including most Administration land.

Figure I demonstrates the rate at which the Commissioner of Titles has issued Final Orders. In 1963 the work of the Commission was accelerated.

(1) See Table 2 for details

This was achieved by conferring on any Land Titles Commissioner, who was a barrister or solicitor of at least five years standing, the jurisdiction then exercised only by the Chief Commissioner. (H.G. L.T.R.O. 1963)
Under the Consolidated Land Titles Commission Rules of March 1965, the work of the Land Titles Commission has again been accelerated by the use of Deputy Commissioners.

.6 Land Titles Commission Ordinance 1962
(Administered by L.T.C.)

The failure of the Native Land Registration Ordinance led to it being repealed in 1963. It was replaced with three Ordinances:-

Land Titles Commission Ordinance 1962 (No.5/1963)

Land (Tenure Conversion) Ordinance 1963 (No.15/1964)

Land Registration (Communally Owned Land) Ordinance 1962
(No. 10/1963)

The Land Titles Commission Ordinance is not a land registration ordinance. It primarily provides for:-

- (i) the determining of all land claims and the settling of disputes
- (ii) a system of systematic adjudication of native land rights.

In addition to determining native rights, the Land Titles Commission took over the administration of the New Guinea Land Titles Restoration Ordinance in 1963. (1). The reason for this is not clear. The result of this has been that the functions of the Commission cover such a wide field that no function has been adequately coped with by its small staff.

The functions of the Commission are:-

- (i) The determination of disputes concerning ownership and use of land under native custom. (Sec.15 (1) L.T.C.O.)
- (ii) The determination of disputes as to whether or not land is native land (Sec.15 (1) L.T.C.O.) This includes disputes between natives and the Administration/Crown over waste and vacant land. (Sec.83 L.C.).

The Minister for Territories stated in 1950 that the Native Land Commissioners' (now Land Titles Commissioners) first priority was to investigate claims by the Administration that land is ownerless.(2).

(1) Amendment to N.G.L.T.R.O., Ordinance No.8 of 1963 and Sec.55 L.T.C.O.

(2) Ref.85

Functions (i) and (ii) have been made less onerous by a 1965 amendment to the Land Titles Commission Ordinance which confers on local courts the power to immediately hear any dispute in relation to native land and to make an interim order. This order must in turn be heard and determined by the Land Titles Commission.

(iii) Promotion of the registration of native rights by systematic demarcation and adjudication. (Sec. 17-25. L.T.C.O.).

(iv) In the case of acquisition of native land by the Administration under the Land Ordinance 1962:-

(a) The Administration may apply to the Land Titles Commission for a determination of ownership of land and interests in land. (Sec.32(1) L.O.).

(b) Where the Administration does acquire land, the Land Titles Commission may be required to appoint an agent on behalf of the owners.

(Sec.32 (2) L.O.).

The procedure of the Crown Solicitor's Department until 1965 has been to use the services of the Department of District Administration to carry out (a) and (b). However, the intention of the Crown Solicitor's Department is to use the Land Titles Commission as normal procedure in the future.

(v) In the case of compulsory acquisition of native land, the Land Titles Commission may be required to exercise power to declare or adjust rights and liabilities over the land and determine the basis of compensation. (Sec.23 (6), Sec.93, L.O.)

(vi) The Land Titles Commission may be required to make an order as to the sufficiency or otherwise of the notice served to natives by the Director of District Administration under Sec. 86 (3) of the Land Ordinance.

(vii) The administration of the New Guinea Land Titles Restoration Ordinance.

.7 Land (Tenure Conversion) Ordinance, 1963

(Administered by L.T.C.)

During the period of European influence in Papua and New Guinea, several attempts have been made to rationalise native tenure systems so as to make them more adaptable to commercial agriculture. The form of rationalisation has varied considerably from essentially co-operative ventures (1) to forms of individualisation (2).

(1) e.g. Wap Mechanical Farming Project - H.G.R.U. Bulletin No.1. H'Buke Co-operative Plantation Ref.47.

(2) e.g. Higaturu Local Government Council Land Registration Scheme. Ref.46, 48.

In 1960 the Minister for Territories expressed the need to convert customary tenure into an individual registered title, (1) for indigenes "who need it or will use it". The Land (Tenure Conversion) Ordinance 1963 (No.15 of 1964) is the legal expression of this policy speech. The Ordinance is based on the premises that -

(i) the family farm unit is the most efficacious method of promoting agricultural development in Papua and New Guinea, and that (ii) " guaranteed individual titles to land are the best aid to agricultural development and economic well being....." (2)

The policy of the Administration is to discourage communal farming except for short term crops. However, in many situations, communal or co-operative ventures in processing, marketing, etc., are considered to be effective means of using resources.

(1) Ref. 85

(2) L.S. Debates. 5th Council, 6th Meeting, 1st Session
Vol. 6, No.6, 3-7 Sept., 15-16 Oct., 1962.

The Land (Tenure Conversion) Ordinance is primarily a land tenure measure. It only relates to land registration and conveyancing in so far as tenure converted land -

- (i) must be registered under the Real Property Ordinance, or Land Registration Ordinance
- (ii) must be conveyed subject to conditions concerning fragmentation and dealing. (Part 3 L(T.C.) O.).

In January 1966 the first parcels of land were ready for registration (1).

.8 Land Registration (Communally Owned Land)
Ordinance, 1962.

(Administered by R. of T.)

This Ordinance is supplementary to the Land Titles Commission Ordinance. It provides the necessary legislation for a record to be kept of the findings of the Land Titles Commission with respect to native customary tenure. It replaces the provision for the registration of title of native land under the Native Land Registration Ordinance.

(1) See Table 12.

By November, 1965 no land had been registered.

.9 Real Property (Registration of Leases) Ordinance 1962
(Administered by R. of F.)

The Administration's programme of formal land settlement has snowballed in the last ten years.

The success of both european and indigenous land settlement is largely dependent upon the availability of and access to, credit facilities.

Credit is primarily available through the Ex-Servicemen's Credit Scheme and the Native Loans Board. The amount available is still considered by many as insufficient but the main difficulty has been in gaining access thereto. Delays in making loan money available have been common.

(1). These have been caused primarily by legal and title difficulties. In many cases the registration of a mortgage document has not been possible because the title document has not been registered. The registration of the title (leasehold) document has been delayed by:-

(1) Question on Native Loans Fund. H.A. Debates,
Vol.1, No.2 1-10 Sept. 1964.

(i) Administrative Delays: The lease instrument is drawn up by the Crown Solicitor, conveyancing is executed at the Department of Lands, Surveys and Mines and registration takes place with the Registrar of Titles.

(ii) Survey: This has caused the most serious delays. In other cases the registration of the mortgage document has been delayed by:-

(i) Administrative Delays: The mortgage instrument is drawn up by the Crown Solicitor, the Administrator's assent is given by the Director of Lands, Surveys and Mines, the Local Agricultural Officer obtains the signature of the mortgagor, the Registrar of Titles registers the document.

(ii) Legal flaws in the security documents: This has now been overcome by standardising the form of the security documents.

Prior to 1962 the following procedures were usually employed because of delays in survey:-

- (a) The applicant would apply to the Land Board for lease.
- (b) Grants of application would be based on the preliminary sub-division or design of the Land Settlement Division.

- (c) The "Granted Application for Lease" would be gazetted.
 - (d) Under the Land Ordinance (1) this "Granted Application" could be assigned. The mortgage was an equitable mortgage. It was usual for the interests of the assignor and certain interests of the assignee to be protected by a deed of defeasance or a deed of covenant. This procedure has in itself been cumbersome, causing further delay.
 - (e) The lease instrument would be registered on completion of the survey. In the meanwhile the lessee's title rested on the "Letter of Grant", which set out the terms and conditions of the lease and was registered at the Department of Lands, Surveys and Mines.
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(1) Land Ordinance (Papua) 1912, Sec.11,12. The Administration did not guarantee the position, boundaries and area of land of a granted application until the Survey was completed.

By 1962 there was a serious backlog of "granted applications" awaiting survey. (See Table 8).

The Land Ordinance 1962 (No.6 of 1963) abolished the "granted application" system in order that all leaseholds could be dealt with in the systematic and efficient way provided under the Real Property Ordinance and Land Registration Ordinance. The title is now registered prior to assignment. As survey was in no way keeping up with the land settlement programme it was necessary to permit registration of leases "subject to survey". The Real Property (Registration of Leases) Ordinance made legal provision for the Registrar of Titles to register leases "subject to survey". (1)

.10 Registration of Individual Usufructuary Rights over Native Land

(Administered by Local Government Councils)

Prior to 1960 two Local Government Councils had established their own registration of rights schemes. They were Higaturu and Anbenob Local Government Councils.

(1) H. A. Debates. 5th Council, 4th Meeting, 1st Session.
5th - 9th March, 1962. Vol.6, No.4

Under the Council Rules, an individual could be assigned usufructuary rights over clan land upon the written consent of the clan elders. This enabled the planter proprietary rights over the economic trees planted but the right of control of the land remained with the clan. (See Chapter 6, Part 2).

A memorandum by the Administrator in June, 1960 (1), elaborating on the policy statement of the Minister (2), discouraged Local Government Councils from making rules that relate to land holding or registration.

Statutory provision was made in 1964 for Local Government Councils to record the following customary rights (Sec.54 L.G.O. 1963):-

- (i) individual occupation or use of native land.
- (ii) individual rights to ownership of trees and other crops.

By January 1960 no Local Government Council had established a register.

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- (1) "Land Tenure in Papua and New Guinea" HH 19/60
13. 6. 1960.
 - (2) Ref. 85

2. MEASURES OF LAND REGISTRATION AND CONVEYANCING
MEASURES

.1 Land Ordinance

(i) Registration of Transfers from Natives to
Crown/ Administration

In Papua, prior to the Land Ordinance 1962 transfers from natives to the Crown were registered in the Deed of Attestation. Register^{by}/the Registrar of Titles. The Register acquired this name because, prior to the proclamation of Papua as a protectorate, the private transfers between individuals and natives were called Deeds of Attestation.

In the case of New Guinea, the Land Registration Ordinance made provision for the recording of transfers in the Index of Unregistered Administration Lands at the Title Registry. (Sec.43A L.R.O.)

Under the Land Ordinance of 1962 no provision was made for the registration of deeds of transfer by the Registrar of Titles except for those pertaining to acquisition by compulsory process (Sec.22 L.O.). The Chief Draftsman of the Department of Lands, Surveys and Mines now maintains an unofficial register entitled "The Native Land Dealings Register".

The legal status of the Deeds of Attestation, Unregistered Administration Lands and The Native Land Dealing Registers is discussed in Appendix 5.

(ii) Leasing of Administration Land

Application for leases are considered by the Land Board. (1) (Sec.11 (6) L.O.).

Conveyancing of leases is executed in the Department of Lands, Surveys and Mines.

Final registration is carried out by the Registrar of Titles under the Real Property Ordinance and Land Registration Ordinance. (Sec.125 L.O.)

(iii) Dealings with Administration Land.

Under Sec.75 of the Land Ordinance a person is not entitled to deal with leased or freehold land without prior approval in writing from the Administrator. Dealings without prior approval are regarded null and void except in cases of dispensation by the Administrator due to inadvertence.

- (1) The Land Board is a statutory body created under the L.O., not to be confused with the Land Development Board.

It was not until 1960 (1) that indigenes who held alienated land, either freehold or leasehold, were permitted to sell or otherwise dispose of their interests without having to seek the approval of the Director of Native Affairs. The 1960 Amendment was necessary to enable enterprising natives to obtain finance for cash cropping.

(iv) Dealings with Native Land.

A native has no power to deal in native land other than with the Administration or with other natives in accordance with native custom. (Sec.16, 81L.O.)

.2 The Grundbuch System.

Important features of the Grundbuch System were:-

- (i) Prussian land law was based on a conception of allodial ownership of land.
 - (ii) Registration was a dispositive act. Therefore registration was made highly desirable but not compulsory.
 - (iii) Rights and equities, if registered, were effective against a third party.
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(1) Land (Papua) Ordinance 1960, Land (New Guinea) Ordinance 1960.

- (iv) Rights of bona fide third parties could not be disturbed despite fraud or incorrectness of the Register.
- (v) Priority of rights was in the order of registration.
- (vi) Entries in the Grundbuch were not conclusive evidence in court. The authority of the Register could be challenged under Sec. 9 and 10 of the Prussian Land Statute 1872. Nevertheless security of title was such that title by prescription against a registered owner was not possible under Sec.6 of this Statute. However, under the German Civil Code greater recognition of prescription was given. (1).
- (vii) It was possible to lodge a provisional objection against a registered owner, thus warning third parties and preventing the owner, in the meanwhile, from selling or bonding his property. (Widerspruch).
- (viii) The system of transfer was by verbal conveyancing before a Grundbuch official.
- (ix) Administration was decentralised. The Registry was at the District Court of Justice, the Judge being the Registrar. Cadastral and judicial districts were identical.

(1) Ref. 161

(x) Each folium of the Register consisted of four sections:-

- Page 1 - detail of parcels
- Page 2 - detail of the proprietor
- Page 3 - detail of encumbrances and restrictions
- Page 4 - detail of hypothecs, land charges,
annuity debts, etc.

(xi) The local registry officials were held responsible for the correctness of entries. The state had a subsidiary responsibility but there was no assurance fund.

(xii) The essential foundation of the system in Europe was the "cadastre". This was a complete up-to-date register of all parcels and rights. This was not possible in New Guinea due to the haphazard nature of land settlement and acquisition.

(xiii) All survey operations were carried out by a cadre of official surveyors. The work of this survey corps was badly in arrears when repatriated to Germany in 1915. (1)

(1) Ref.136

(xiv) Very substantial marking was made with concrete pillars.

(xv) The purchaser would bear the cost of survey, demarcation and registration.

(xvi) It appears that natives were not expressly barred from being registered as right holders. The Land Registration Ordinance made express provisions (Sec.38 (c)) for the re-registration of such native owners and native communities.

.3 Real Property Ordinance and Land Registration Ordinance

A commentary on the Real Property Ordinance and Land Registration Ordinance appears in Chapter 12. It will suffice here to make the following remarks.

(i) Western Tenure Concepts

Both the Real Property Ordinance and the Land Registration Ordinance are registration of title measures which only apply to parcels over which "western type" tenures are held. They are constructed from western tenure concepts of which most are English in origin, e.g., seisin, mortgage, reversion, easement, incorporeal right, joint tenant. Even the definition of "land" in these ordinances is given in western tenure concepts.

The Land Registration Ordinance specifically states that "no registration under the ordinance shall affect any system or custom of land tenure or of succession to land or transmission of land in use amongst natives. (Sec.41 (1) L.R.O.)

(ii) Native Registered Owners

Sec.4 of Land Ordinance 1906 permitted a native to acquire alienated land, under a will or an intestacy. However, the Real Property Ordinance made no mention of the registration of natives as proprietors until Sec. 92 A was inserted in 1935 (1). This entitled natives to become registered proprietors by native custom upon the death intestate of a native registered proprietor. As the Ordinance only provides for western inheritance procedures, the native so entitled by custom was to be certified by the Lieutenant Governor or Government Secretary. (2).

On the other hand, the Land Registration Ordinance expressly disentitled a native or group or community of natives to be registered in the Register Book as the owner or encumbrancee of freehold land (Sec.40 L.R.P.) Where a native or native community

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- (1) Real Property Ordinance 1935. No.16 of 1935
 - (2) In 1955 this became the Director of Native Affairs, by the R.P.(Papua)O.1955, No.64 of 1955.

was registered as the owner of land, or of any right in land, in the Grundbuch, the Director of Native Affairs was to be named as owner or encumbrancee, respectively, in the Register Book and described as trustee for the natives. Thus land owned by natives in the Grundbuch became a native reserve, with the Director of Native Affairs as trustee, in the Register Book. (Sec.38 (c), 15(1) L.R.O.)

Sections 38 and 40 were repealed in 1963 (1) Their operation from 1922-1963 had the effect of disallowing native owners, originally registered in the Grundbuch, the benefits of a modern land registration system.

Sec.159C, inserted in 1963, of the Land Registration Ordinance permits the transfer of land to a person entitled thereto by native custom, if the owner dies intestate. The entitled native must be so certified by the Director of District Administration prior to registration.

(1) L.R. (M.C.) O. 1962 (No.19 of 1963)

Notwithstanding the above, natives in New Guinea have been registered as lessees. By 1958, 2072 acres of Administration land had been leased to individual indigenes (1). However, Sec.41 (2) of the Land Registration Ordinance states that such entries in the Register Book are not conclusive evidence in the case of an ownership dispute between indigenes.

.4 Native Land Registration Ordinance

Causes for the failure of this Ordinance:-

(i) The administrative policy of the Native Land Commission was not oriented towards fulfilling the Department of Territories' primary aim of uncovering waste and vacant land. Early policy of this Commission aimed at finalising the registration of native land in (a) those Districts where the main agricultural development had taken place, e.g. New Britain, New Ireland, and (b) in the densely populated areas of the Highlands where the extension of Administration control

(1) A.R.(N.G.) 1957-58

had enabled tribes to move back to their hereditary lands from which they had been driven by tribal warfare.(1).

Only in the case of (a) would ownerless land be found and in neither case would large tracts be available for purchase due to population pressures. An exception would be parts of New Ireland and Southern New Britain.

(ii) The Native Land Commission had two incompatible functions:-

(a) It was a special tribunal for disputes in land. (Sec.10 H.L.R.O.). In addition it was given exclusive jurisdiction to hear land disputes. All land disputes were removed from the Court of Native Affairs.(2).

(b) It was to systematically investigate and adjudicate on all claims to land, disputed or undisputed.

Under (a) registration is sporadic and slow and deals only with disputed claims. Under (b) registration is systematic and deals once and for all with all claims.

(1) A.R. (N.C.) 1952-53

(2) Appeal Court decision in Basir aliss Levin of Lamonkoa (appellant) v Havini of Kemamanu (respondent)

Because of expediency and pressure of work the Native Land Commission was forced to give priority to (a).

(iii) Very limited staff and resources. In the early years a Commissioner would collect evidence, including genealogies, define boundaries, carry out a chain and compass survey, hold the enquiry and make a finding.

(iv) The Department of Territories failed to realise the immensity of the task. McAuley did warn in 1952 that anthropologists generally considered the accurate determination of native land tenure practically impossible due to its complexity and obscurity (1).

This failure was admitted by the Minister in 1960.(2).

(v) A satisfactory method of registering the findings of the Native Land Commission was not found.

The Ordinance provided for a registration of title system based on the Torrens system. The Registrar of Titles found that the form in which Native Land Commission decisions were given to him was difficult to translate into the prescribed registration form. (Sec. 5,3(5) and Form 1 N.L. Registration Regulations).

(1) Ref.132

(2) p.12 Ref.193

Suggestions were made (1) but a thorough investigation, with reference to methods used in countries with similar land tenure customs, was not carried out.

(vi) All surveys were executed by Native Land Commission staff ("unauthorised" surveys.) The Registrar of Titles would not accept the survey by the Native Land Commission as satisfactory for title security.

(vii) The actual enquiries were slow because counsels were not used and:-

(a) The disputants were incapable of exercising their rights of cross examination. The Commissioners often undertook detailed questioning to uncover false or concealed evidence.

(1) "..... I do not think any attempt should be made to determine and register the various usufructuary rights flowing out from the tribe or clan according to native custom. Any attempt to do that will slow up the work tremendously."

Ref.121.

(b) The disputants were not aware of what was relevant and irrelevant evidence.

(viii) In some areas, natives viewed the Native Land Commission with considerable suspicion. In the Northern District, for example, it took

approximately 18 months for the people to accept the idea of cutting their boundaries and stating their claims to the Commissioner (1).

During this time the Commissioner was limited to collecting genealogies and information on local land custom.

.5 New Guinea Land Titles Restoration Ordinance

Under this Ordinance power is given to the Land Titles Commissioner to determine native rights in so far as they infringe upon a claim to a lost title.

Several native claims have been investigated especially in the Gazelle Peninsula area. However, it is very difficult for these claims to be awarded as they were investigated prior to re-registration in the Torrens Register from the Grundbuch. Also the Varzin case (2) has

(1) Statement by ex-Native Land Commissioner of Northern District.

(2) High Court of Australia. Nov. 30th, 1964 and Ref. 167.

established that it is not possible to destroy the title of a registered proprietor under the Land Registration Ordinance, merely on the grounds that the Register Book was destroyed.

Native claims determined under the New Guinea Land Titles Restoration Ordinance are not registered with the Registrar of Titles.

.6 Land Titles Commission Ordinance

The Land Titles Commission Ordinance makes more specific provisions for the procedure of systematic registration than does the Native Land Commission Ordinance. Adjudication Areas may be proclaimed and demarcation committees appointed. This legislation generally follows the pattern of similar legislation in other developing countries. (1). It is not known which measures (if any) from other countries were used as a basis for this legislation.

In comparison with similar overseas measures, this Ordinance is very flexible with respect to the actual operation of the demarcation and adjudication process. For example, there is no provision for the appointment of Adjudication, Demarcation or Registration Officers.

(1) Ref.224.

The Land Titles Commission has maximum flexibility as to the administrative procedures and constitution of the Demarcation Committees. In Chapter 7 the procedures experimented with and those in use are evaluated.

.7 Land (Tenure Conversion) Ordinance 1963

The registration of tenure converted land under the Real Property Ordinance and Land Registration Ordinance necessarily involves the following:-

(i) Change in the Meaning of "Land".

Although native land has been respected under Papuan and New Guinean land policies, (Para.2.1(iv)) its meaning has remained undefined.

After conversion, "the land" acquires a western meaning. In particular, the Latin maxim "Quicquid plantatur solo, solo cedit" obtains. No allowance is made in the Land (Tenure Conversion) Ordinance for any native concepts of land to continue.

(ii) Change of Sovereignty

All land except native land is the property of the Administration, "subject to any estates, rights, titles or interests from time to time in force under any law in force in the Territory or part of the Territory." (Sec.7 (1) L.O.1962).

Sec.16(a) of the Land (Tenure Conversion) Ordinance states that tenure converted land "ceases to be native land". Although neither the Land Ordinance nor the Land (Tenure Conversion) Ordinance define "native land," it is presumed that both Ordinances use the same meaning. Therefore conversion has the effect of changing the sovereignty of the soil from the native group or individual to the Administration.

It would appear that in a case of escheat (1) the land would revert to the Administration and not to the original native owners. It is admitted that a case of escheat is highly unlikely because of the pattern of native customary inheritance laws.

It appears unnecessary to insist on a change of sovereignty in tenure conversion. The Higaturu Local Government Council Land Registration Scheme, although experimental in many respects, demonstrates the feasibility of assigning rights of use and ownership of economic trees to an individual without interfering with tribal or clan sovereignty.(2).

(1) It is presumed that the common law doctrine of escheat still holds in Papua and New Guinea.

(2) Chapter 6.

(iii) Registrable and non-Registrable Rights

Tenure converted land, by registration under the Land Registration Ordinance and Real Property Ordinance, is made to conform to Australian concepts with respect to registrable and non-registrable rights. Many rights which are created under native custom will not be registrable. The consequence could be a gamut of unrecorded equitable interests.

(iv) Fragmentation on Devolution and Co-ownership

The Land (Tenure Conversion) Ordinance permits no more than six tenants-in-common on the Register. (Sec.24(2)).

The Land (Tenure Conversion) Ordinance is rigid with respect to the registration of land upon succession. If the registered land devolves to more than six persons the Land Titles Commission has the following remedies:-

- (a) To encourage beneficiaries to transfer their interests such that the maximum number of proprietors is six.
- (b) To select six of the beneficiaries by ballot and order them to compensate the remaining beneficiaries.
- (c) To sell the land and distribute the proceeds to the beneficiaries.

The Land Titles Commission has no remedy by means of:-

- (a) Notation of trusts - This follows Australian registration practice (Chapter 10).
- (b) Partition - Partition of land, provided the consequent parcels are of economic size, can be a most effective remedy.

The pattern of devolution of interests in tenure converted land is unpredictable and will certainly vary considerably throughout the Territory. Maximum flexibility in the handling thereof is essential.

- (v) Protection against Loss of Landed Interests.

Individual ownership of land in low income communities may result in a state of heavy indebtedness on the one hand and the emergence of a wealthy money lending class on the other. The Ordinance has attempted to avoid this state of affairs by regulating the dealings in tenure converted land.

Unless the Land Titles Commission otherwise directs (Sec.26(b) L(T.C.) O):-

- (a) Land can only be transferred or leased to natives or to the Administration.

- (b) Land cannot be taken away from the native under any circumstances including a writ of execution, bankruptcy or insolvency.
- (c) In the case of default, a mortgagee cannot
 - (1) remain in possession for longer than three years or
 - (2) foreclose the right of the mortgagor to redeem the mortgaged land.

Therefore the only remedies available to a mortgagee are:-

- (i) personal action
- (ii) receiving rents and profits for a limit of three years
- (iii) possession for a limit of three years
- (iv) distrain

Although such restrictions may need to be imposed in the interests of the indigenuous people, it is nevertheless true that the rights to foreclose and to take possession arise from the very nature of the mortgage contract. As a solution, the Ordinance does not provide for certified lending agencies (in particular a government guaranteed land bank), which are exempted from the general provisions of the above law, in order to encourage secure mortgaging.

The Administration's policy with respect to the mortgaging of native held land is inconsistent. In 1960 the Land Ordinances were amended so as to place natives on an equal footing with non natives with respect to dealings in Administration land (1) held under lease or freehold. It was considered that the Administration still retained ample power under the then Transfer of Land Ordinance (now Part 7 of the LO. 1962) to prevent any attempt at exploitation. (2)

(vi) Normal Conveyancing Practice.

By far the most practical question which arises from the use of the Real Property Ordinance and Land Registration Ordinance for tenure converted land is: When undertaking day to day conveyancing, will native registered proprietors make use of the official conveyancing practice through the centralised Registry at Port Moresby?

(1) L (Papua) O.1960, L.(N.C.) O.1960

(2) A.R. (P) 1961-62. P56

The standard procedure in conveying land under the Real Property Ordinance and Land Registration Ordinance is:-

- (a) To seek approval of the Administrator (through D.L.S.I.) for the conveyance. (Sec.75(1) L.O., Sec.25L(T.C.)O)
- (b) To execute the conveyance on one of the twelve statutory forms. (1)
- (c) To lodge the conveyance at the Registry in Port Moresby.

It would appear that native registered owners have little understanding of the formalities of registration and will not carry out the above procedure without encouragement and assistance. Unless district registry officials are appointed,

(1) e.g. Transfer; Transfer combined with Creation of Encumbrance, Transfer of Mortgage, lease, charge; Creation of Right of Carriage-way, Lease; Sub-lease; Mortgage; Charge; Caveat; Nomination of Trustees; Power of Attorney; Revocation of Power of Attorney.

this assistance would inevitably have to come from an already overburdened Department of District Administration staff.

It is difficult to imagine how records will be kept up-to-date unless conveyancing can be executed simply at a local level.

.8 Land Registration (Communally Owned Land) Ordinance

The register established under this Ordinance is not a "living" register. The register is only "conclusive evidence of the facts therein stated as at the date of the relevant finding of the Commission". (Sec.10(1)).

The registered land is to be regulated outside the register by native custom. (Sec.9 L.R. (COL)O). Therefore it cannot be kept regularly up-to-date by means of registered conveyancing. The Registrar may only bring the register up-to-date as from time to time directed by the Land Titles Commission (Sec. 6).

The importance of the up-to-date maintenance of registers has been firmly established by Dowson and Sheppard. (1). It is therefore necessary to determine why this legislation omits a fundamental of modern land registry practice. No documentary evidence could be found but possible reasons are:-

(1) Ref. 57.

- (i) The registration of title system under the Native Land Registration Ordinance was considered a failure.
- (ii) After the Native Land Commission's experience, the pattern of native rights over land was considered too complex to keep up-to-date.
- (iii) Since the cessation of tribal warfare, tribal and clan lands seldom change hands. Registered conveyancing may have been considered unnecessary.
- (iv) The primary tenure policy of the Administration is to promote individualised tenure. The communal land register was intended only as a stepping stone toward rationalisation of tenure: "the results of such investigation (systematic adjudication) are to be recorded for use in connection with future acquisitions or conversions of title, but are no longer to be registered". (1)

An efficient system of registered conveyancing could tend to over formalise customary tenure and discourage individualisation.

It appears that (iv) has been the most influential reason.

(1) Principle No.7 Land Tenure Policy. Ref.85.

.9 Real Property (Registration of Leases) Ordinance.

The whole meaning of this Ordinance is dependent upon the interpretation of "subject to survey". There are two possible interpretations:-

- (i) subject to demarcation and accurate field survey
- (ii) subject only to accurate field survey

It is difficult to ascertain precisely what interpretation was originally intended. In a speech which foreshadowed the Real Property (Registration of Leases) Bill, the following statement was made: "Where boundaries are already clear on the ground, honourable members will realise that this guarantee (i.e. guarantee of title under the R.P.O. and L.R.O.) is about as effective as a fully registered title" (1).

It appears that the Administration has chosen interpretation (i) because it facilitates dealings in Administration leases more than does (ii).

To expedite the Administration's land settlement policy, the Land Board at times calls for applications for leases over land which has not been preliminarily subdivided by the Land Settlement field officers of the Department of Lands, Surveys and Mines.

(1) L. C. Debates. 5-9 March, 1962. Vol.6, No.4.

Applications are consequently granted on the basis of sub-division design plan only.

The definition of such parcels on the lease instrument is limited to description by abuttals and dimensions off the sub-division design plan (if available). The Registrar of Titles is still in the process of establishing criteria for the investigation of title documents. However, he appears to be following the Australian practice of insisting on dimensions on plans in title deeds, whilst giving little regard to demarcation evidence. To this end the Registrar of Titles is requiring a statement from the Drafting Branch of the Department of Lands, Surveys and Mines to the effect that dimensions are not available where this is the case.

Even in cases where the land has been preliminarily sub-divided the Registrar of Titles will give no recognition to the survey or of the marks placed. The title remains unguaranteed as to "the area or the boundaries". (Sec.5(2))
(1)

(1) The above information was obtained at the Leases Section, D.L.S.M.

Current practice under this Ordinance has resulted in legal titles on paper which are not made to bear any relation to facts on the ground. Security of title has been sacrificed for expediency. "Subject to survey" measures in other countries have invariably been the cause of title insecurity, disputes and litigation. (1)

The statement in the Papuan Annual Report 1961-62 that the Ordinance" is designed to increase the certainty in land tenure by allowing registrable Administration leases to be issued "subject to survey", thus expediting the issue of registered leases" (2) must be seriously questioned. Although the Ordinance may expedite dealings, it is very unlikely that "certainty in land tenure" will ultimately result.

The introduction of this Ordinance is highly significant in the history of land registration concepts in the Territory. In effect, the Ordinance enables particular land titles (leases from the Administration/Crown) to be administered under the superior machinery and legal features of a Torrens system, without necessarily affording security of title in the practical sense.

(1) e.g. Australian and North American experience with free selection before survey.

(2) A.R. (Papua) 1961-62 P.57.

A land registration measure will only succeed if there is a clearly defined and substantiated relationship between title document/plan and actual ground marks. The superior machinery and legal features of a registration of title system are only means to the ultimate end of practical security and convenience to the landowner. This attempt to divorce the means from the end must have serious repercussions in land title security in years to come.

.10 Section 54 of Local Government Ordinance

This section appears to contravene the policy statement of the Minister in 1960. (1) The first principle laid down in this policy is:-

the long-term objective of introducing "a single system of land holding regulated by the Central Government by statute providing for secure individual registered titles"

Section 54 of the Local Government Ordinance creates a second formal system of land holding, regulated by the Local Government Councils, which provides for secure individual registered usufructuary rights. It may be argued that Section 54 was only intended so that Councils could regulate land use. Clause 3 states that the Council may in connection with the register:-

(1) Ref. 85

- (i) limit the use of any native land not recorded
- (ii) authorise special assistance to be given to persons holding recorded individual rights by native custom.

However, Clause 4 clearly states that the register may be used as "evidence in the matters recorded therein". It therefore takes on the function of a legal register. Albeit, the register does not provide conclusive evidence because the findings of the Land Titles Commission under the Land Registration (Communally Owned Land) Ordinance or the Land Titles Commission Ordinance are superior evidence (Sec.54(5) &(6) .

GENERAL REFERENCES

119, 135, 140, 179, 185, 193, 224, 230.

CHAPTER 6

THE RATIONALISATION OF CUSTOMARY TENURE

1. INTRODUCTION

Rationalisation⁽¹⁾ may be innovated:-

- (i) at the local level, to solve local problems
- (ii) by the central government, and offered as a solution for local problems.

The Administration's policy is to encourage rationalisation by means of (ii)⁽²⁾

2. LOCALLY INNOVATED RATIONALISATION

.1 PARCELS SUB-LEASED FROM LOCAL GOVERNMENT COUNCILS⁽³⁾

Tenure of Council: 99 year agricultural lease from the Administration.

Tenure of Farmer: Legal sub-lease from Council.

Purpose: To give individualised title for cash cropping.

(1) See Glossary for definition

(2) Ref.85

(3) District Commissioners' Conference 1958
and Refs. 226, 45, 228, 52.

<u>Scheme</u>	<u>Council</u>
Vudal Land Settlement Scheme	Rabaul
Warangoi Land Settlement Scheme	Vunamami
Ambenob Cocoa Project	Ambenob

.2 PLANTATIONS OPERATED BY INDIGENOUS CO-OPERATIVES (1)

Some plantations are owned and operated by native co-operative societies, eg. M'Buke, M'Bunai plantations in Manus District, Kuradi plantation in Gazelle Peninsula.

Others are operated by native co-operatives for absentee landlords, e.g. Seeadlerhafen, Monote, Lambrum plantations in the Manus District.

.3 COUNCIL LAND REGISTRATION SCHEMES (2)

Authority: Higaturu Local Government Council

Ambenob " " "

The Ambenob Scheme was a copy of the Higaturu Scheme.

The following details relate only to the Higaturu Scheme.

Tenure of Farmer: Exclusive usufructuary rights by cash cropping with group sanction.

Parcel Size: approx. 2 acres.

(1) Ref.47.

(2) District Commissioners' Conference 1958 and Refs.

226, 227, 52, 46, 48, 131.

Sovereignty of Land: Clan

Purpose: To "adopt existing Orokaiva clan practices re the allocation of individual usufructuary rights so that a pattern of individually owned cultivation emerges"⁽¹⁾

Procedure:

- (i) The individual applied to the supervising officer of the Council (a D.N.A. Officer)
- (ii) A departmental officer (D.N.A. or D.A.S.F.) executed a chain and compass survey in the presence of the land-holding clan.
- (iii) An agreement was made and witnessed between clan elders, the local councillor and the applicant.
- (iv) Forms and maps were prepared in triplicate a copy to applicant, Council and District Office.

Causes of Failure: The following causes demonstrate that the principle features of the scheme were not primarily at fault:

- (i) The permanency of the scheme was in doubt. Top level policy discouraged Councils "from making rules that relate to land holding or recording of rights, pending the enactment of tenure conversion legislation"⁽²⁾. The scheme was allowed to continue on an experimental transitional basis only.

(1) J.E. Gunther Memo to D.C. D.A.S.F.(Pop.)file 12-1-A(5)

(2) "Land Tenure in PNG" H.H.19/60 13th June, 1960.

- (ii) The original⁽¹⁾ scheme was in operation for less than one year when it was ruled illegal by the Administration. There were no further registrations for nearly three years.
 - (iii) When the modified⁽²⁾ scheme was initiated in May, 1960, new applications could not be dealt with until nearly all registrations under the original scheme were resurveyed and ownership reinvestigated.
 - (iv) Applicants became impatient with delays caused by staff shortages and by difficulties in obtaining signatures for documents.
 - (v) Discontinuity in administration was caused by regular staff changes.
 - (vi) Since 1963 there has been an increasing interest in native land settlement blocks and "Yoga" type blocks (Para 4). Registered rightholders became aware of the disadvantages of fragmented parcels.⁽³⁾
 - (vii) The 1963 decline in coffee prices stimulated interest in cocoa.⁽⁴⁾
-

- (1) In the original scheme, the land was assigned outright.
- (2) In the modified scheme, only the right of usufruct was assigned.
- (3) One man could operate up to 20-30 scattered blocks of $\frac{1}{2}$ - 2 acres each.
- (4) Most registered blocks were planted with coffee.

- (viii) Employment on expatriate plantations posed an attractive alternative to small holding operatorship.
- (ix) Some natives believed the scheme would provide a quick way to bridge the standard of living gap.
- (x) The Administration did not permit the Council to pass rules concerning land dealings and devolution.

Advantageous Features of the Scheme:-

- (i) Sovereignty of the land remained with the clan.
- (ii) Procedures were simple.
- (iii) The act of assignment was simple and understood by the people.
- (iv) A high degree of title security in the eyes of the local people.
- (v) Council involvement.
- (vi) Low cost of operation - commensurate with the low value and use of the land.
- (vii) A locally based officer acted as the registry official

.4 INDIVIDUALISATION OF SMALL PARCELS IN THE NORTHERN DISTRICT

In the early 1960's, officers of the Department of Agriculture, Stock and Fisheries began cutting up contiguous parcels for individual use, upon the request and consent of the local people. Area of parcels ranged from less than 1 acre to 5 acres.

Each scheme consisted of about forty blocks grouped each side of an access road. Rough surveys were carried out mainly by native staff. No record of the survey was kept. The parcels were not formally registered.

These have frequently been termed "Yega" type schemes because the "Yega" scheme was the first such subdivision. A list of the early schemes is given in Table 9.

The idea gained native popularity but Departments treated schemes with caution. The Administrator had promulgated in June 1960 that "pending enactment of legislation and promulgation of administrative instructions providing for conversion of land, development or settlement schemes purporting to include allotment to individuals of the long term use of land by procedures other than those in which the individual farmer is issued with title by the Administration through the Department of Lands, Surveys and Mines are not to be instituted".⁽¹⁾ By August, 1962 native interest had so increased that the Administrator permitted officers to give advice and assistance on sub-division provided the natives asked for it.⁽²⁾ The increase in cash cropping in the Northern District (Table 10) is partly

(1) "Land Tenure in P & NG" H.M. 19/60 13th June, 1960.

(2) Minutes of 43rd Meeting of L.D.B. 2nd July, 1962.

attributable to the individualisation of parcels. Early in 1964 the Department of Agriculture, Stock and Fisheries decided on a minimum block size of 15 acres and that blocks "would be fully defined with boundaries at the time of marking them out".⁽¹⁾ The first such case was the Ombisusu scheme.

In 1964-1965 the block sizes of the early schemes were extended where possible e.g. The Yega blocks were extended from 1 to 10 acres.

3. LAND TENURE CONVERSION

At December 1965 the Northern District was the only District where tenure conversion operations were well underway.

.1 GENERAL PROCEDURES

(i) Prior to December, 1964, procedures within departments and between departments varied from scheme to scheme. As procedures were found inadequate they were attended to.

Most of the early schemes were resurveyed by the Land Titles Commission staff because the original sub-division by the Department of Agriculture Stock and Fisheries staff was unsatisfactory for conversion purposes.

(1) 6/8/64 D.A.O. to Dir. D.A.S.F.
D.A.S.F.(Kone) Tenure Conv. File.

(ii) Between December, 1964 and October, 1965 changes were made in the investigational phases so that poor subdivisional designs could be avoided.⁽¹⁾ Improvements were also made in the priority and approval phases.⁽²⁾

The Land Titles Commission staff executed all surveys.

Agricultural Officers assisted claimants in making applications for tenure conversion.

(iii) By October, 1965, Land Titles Commission field staff were well behind with survey. The Department of Agriculture, Stock and Fisheries recommenced "cut up and mark surveys", at a similar standard to its early subdivisional surveys. This was considered necessary so that schemes could be commenced when indigenous enthusiasm was high.⁽³⁾ ⁽⁴⁾

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- (1) e.g. In the Dobadura/Wauta Scheme, the presence of an old army road which passed through the land was overlooked.
 - (2) In the Dobadura/Wauta Scheme, a resurvey was necessary because the original survey was executed prior to D.A.S.F. (Kono) approval which required an alteration in block size.
 - (3) 8/10/65 D.A.O.(ND) to Dir. D.A.S.F. D.A.S.F.(Pop) Land Tenure Conversion Reports General File.
 - (4) Schemes surveyed by D.A.S.F. staff include Ambeni, Kikinota, Bepora.

(iv) Future Procedures: In October, 1965 the Administrator issued a tenure conversion policy directive.⁽¹⁾

It is proposed that a survey of the external boundaries of the conversion area and internal roads will be executed by Department of Lands, Surveys and Mines staff to "Authorised Survey" standard.

The internal subdivision will be executed with chain and compass by field officers.

(v) The Determination of Clan Boundaries Prior to Survey of Scheme.

Early practice of the Department of Agriculture Stock and Fisheries was not to determine clan boundaries prior to initiation of a scheme. In some cases the consequences were unfortunate. In Urio⁽²⁾ natives began planting on Crown Land, In Dapori⁽²⁾ the original subdivision extended into adjoining clan land.

The Land Titles Commissioner in the Northern District has insisted upon a determination of clan boundaries prior to the tenure conversion of parcels within clan land.

(1) H.H. 31-1-9 October, 1965.

(2) I.T.C. (Pop) Tenure Conversion Schemes File.

Prior to October, 1965 the survey of these clan boundaries was executed by Land Titles Commission Staff. Since October, the Department of Agriculture, Stock and Fisheries agreed to do the survey.

(vi) Conclusion

Procedures have evolved in 1964-65. They have become increasingly complex with respect to inter-departmental co-ordination and oversight from Head Office.

.2 PROGRESS IN REGISTRATION AND SURVEY.

(i) Summary of progress in tenure conversion in Northern District : refer table 11.

(ii) Schemes where title has been or is in the process of being converted : refer Table 12.

(iii) Progress in Survey. In the 14 months prior to December 1965, 339 blocks had been surveyed by the Land Titles Commission.

During most of this period two expatriate field officers had been employed. Causes for this slow rate were:-

(a) The field officers were required for other Land Titles Commission work as well as tenure conversion.

(b) Some resurveys were found necessary.

(c) Indigenous assistants were being trained.

Refer Table 13 for rate of survey of particular schemes.

(iv) Processing of Applications

Apart from survey, the main delay has been in the processing of applications for tenure conversion. Prior to May, 1965 the actual conversion procedures were elementary.

The Land Titles Commission Rules of May, 1965 introduced forms of a more legal nature and required five copies of three forms with each application. The processing of applications is considerably time consuming for Department of Agriculture, Stock and Fisheries Staff.

(v) Parcels of Inadequate Size

Under the Administrator's policy directive of October, 1965, ⁽¹⁾ registration is to be used to prevent fragmentation. Cases have arisen ⁽²⁾ where natives are anxious for individual blocks but the land area available does not permit blocks of registrable (economic) size. Two alternatives of formal registration may be available:-

(1) H.H. 31-1-9 October, 1965

(2) e.g. Sanananda Scheme: blocks average $1\frac{1}{2}$ acres each.

- (a) Register the blocks with the Council when (and if) a register is established under Sec.54 of the Local Government Ordinance (Ch.5, Part 1.10,2.10).
- (b) Register the blocks for residential purposes under the Land (Tenure Conversion) Ordinance. It is not likely that the Administrator's Advisory Committee will approve this when it is known that blocks will be used for agriculture.

.3 SURVEY OPERATIONS

The survey and marking of schemes has been the most unclarified of all procedures. (1)

- (i) Surveys by Department of Agriculture, Stock and Fisheries Staff.

Personnel: Indigenous field officers trained by expatriate Agricultural Officers and Land Titles Commission Field Officers.

Survey Practice: Normal field routines and booking methods have not been insisted upon. Field notes are very poorly presented and often not kept at all. Plans of subdivision are of poor quality and at times lack such essential information as type of marks placed, dimensions, numbering of blocks, scale and north point.

(1) "the question of who is to survey the blocks has never to my mind been satisfactorily resolved". 27/7/65 D.A.O(N.D.) to Dir.D.A.S.F. D.A.S.F.(pop)Land Tenure Conversion Reports General File.

(ii) Surveys by Land Titles Commission Field Staff

Personnel: Land Titles Commission expatriate Field Officers. These are not qualified in surveying but have often had experience as survey field hands or instrument operators.

Survey Practices: The standard of work in chain and compass surveys has been reasonable, particularly in recent years.

Government field books are frequently used. Field notes are often of poor standard. Booking methods vary greatly between officers.

(iii) Surveys by Department of Lands, Surveys and Mines Staff.

The District Commissioner of the Northern District recommended in August, 1964 that a Department of Lands, Surveys and Mines surveyor be stationed in the Northern District in the light of the land development taking place.⁽¹⁾

In January, 1966 the Surveyor-General promised to have a survey team available in the Northern District within 4-6 weeks.⁽²⁾

(1) 5/3/64 D.C.(N.D.) to Assistant Administrator(Economic Affairs) "Land Settlement, Land Tenure Conversion and Economic Development in Northern District". Land Tenure Conversion (Pop.) Tenure Conversion File.

(2) 28/1/66 "Proposed Step Structure for Land Tenure Conversion" D.A.S.F.(Kono) Land Tenure Conversion File.

(iv) Transfer of Land Titles Commission Field Staff to the Department of Lands, Surveys and Mines.

All Land Titles Commission field staff was transferred to the Department of Lands, Surveys and Mines in January, 1966.

The advantages of such a changeover are:-

(a) The Land Titles Commission should be an independent judicial commission. It should not execute any departmental service functions.

(b) Land Titles Commission field staff now comes under the influence of a department which has survey as one of its primary functions.

(c) The Division of Surveys of the Department of Lands, Surveys and Mines can exercise more direct control over surveys required by the Land Titles Commission.

The main disadvantage of the changeover is that as the Department of Lands, Surveys and Mines is committed heavily to the Land Settlement programme, less staff might be available for Land Titles Commission needs.

(v) Indigenous Field Assistants employed by Local Government Councils.

The Land Titles Commission has approached the Local Government Councils⁽¹⁾ with regard to their employing two

(1) 2/2/66 Assistant Senior Com. (Rabaul) to all L.G.Cs.

indigenous surveyors per Council. These "land officers" would be trained by the Land Titles Commission at Rabaul and seconded by the Councils to the Land Titles Commission. They would be used in surveys associated with tenure conversion and systematic adjudication.

The Councils in the Popondetta Sub-District have expressed interest, provided the officers are used in the respective Council areas.

<u>Advantages</u>	<u>Disadvantages</u>
1. Council involvement in the work of the Land Titles Commission. 2. Council contribution to cost of survey	1. Poor standard of training 2. The land officers are not under the supervision of qualified surveyors. 3. There is no standard of survey practice for such officers, therefore no statutory control over their work. 4. The employment of land officers in each Local Government Area may not be the best allocation of staff.

(vi) Datum of Scheme Surveys

A system of isolated surveys has been employed. In December, 1964 the Surveyor-General agreed that the connection of these surveys to official surveys was essential⁽¹⁾ and that he would endeavour to have the necessary connecting traverses made.

Datum ties for Yega, Barisari, and Ombisusu were requested in January, 1965⁽²⁾ but the Department of Lands, Surveys and Mines could not fulfil the request due to other staff commitments.

Datum points have been established by the Land Titles Commission in some schemes. They are usually tree blazes of poor quality and would only remain visible for 1-2 years.

(1) 1/12/64 S.G. to F.O. (Oxlade)
L.T.C. (Pop.) Correspondence File.

(2) 20/1/65 F.O. (Oxlade) to Executive Officer L.T.C.
D.A.S.P. (Pop) Land Tenure Conversion File.

(vii) Accuracy of Survey

The Land Titles Commission field staff has worked to the following accuracy requirements for chain and compass surveys:-

level and undulating country	
(slopes less than 10°)	1 in 200
Mountainous country	
(slopes greater than 15°)	1 in 100

Many of the compasses used by the Land Titles Commission and the Department of Agriculture, Stock and Fisheries have been of poor quality. This is exemplified by the following comparison of compasses held by various Departments at Popondetta:-

Land Titles Commission	Wild	66°	20'
Dept. Lands, Surveys and Mines	Wild	66°	20'
Meridian	No.1	65°	10'
	No.2	66°	20'
Meridian	Combination	68°	00'
Prismatic	51808	65°	00'
Prismatic	8931	66°	30'

In addition, compass bearings can be adversely affected by the practice of placing the compass on the top of steel pickets for observation.

(viii) Monumentation

In the early schemes, wooden posts were used at parcel corners. In later surveys, steel star pickets have been used.

Wooden posts are generally unsatisfactory in the New Guinea climate. Steel pickets are difficult to find.

No reference or witness marks have been used.

Some plans which accompany the tenure conversion applications do not indicate the nature of marks placed, cements excepted.⁽¹⁾ Sec.13 of the Land Titles Commission Ordinance requires the Commission to take such action as to "ensure with reasonable certainty that the boundaries of land on a conversion plan are permanently identifiable on the ground".

The Land Titles Commission has not satisfactorily fulfilled its obligations under this clause.

The Land (Tenure Conversion) Ordinance (Sec.31(1)) requires registered proprietors to maintain boundary marks. This is an unfair demand unless long lasting statutory marks are used.

The clearing of boundaries is an important form of boundary marking, even though the cleared line will be overgrown in 1-2 years. It is the only way natives can

(1) e.g. Plans of Yega, New Warisota, Ahora, Barisari.

fully appreciate the limits of the land.

In some early schemes attempts were made to mark corners but not out all boundaries. This proved unsatisfactory and led to an incident at Unga in April, 1965. (1)

(ix) Unsatisfactory Features of Survey Operations Prior to December, 1965.

- (a) Generally, field staff were poorly trained in surveying and plotting.
- (b) Survey operations not supervised by adequately trained surveyors.
- (c) No statutory regulations regarding the marking of boundaries.
- (d) Duplication of survey was necessary in the case of early schemes. The same duplication could have reoccurred with the re-engagement of Department of Agriculture, Stock and Fisheries Staff in "cut and mark" subdivisions (Para.3.1(iii)). However, the insight of the Land Titles Commission Field Officer has led to an arrangement where:
 - (1) The Land Titles Commission Field Officer surveys the roads.
 - (2) A Department of Agriculture, Stock and Fisheries Officer executes the subdivision.

(1) 18.5.65 A.D.C. to D.C.(N.D.)

L.T.C. (Pop.) Tenure Conversion File.

- (3) The Land Titles Commission Field Officer checks the subdivision.

This is fully in accord with sound surveying practice.

- (e) Poor datum points
- (x) Unsatisfactory Features of Survey Operations after December, 1965

As a result of the Administrator's directive, improvements will be made (Para.3.1(iv)). However, the following deficiencies still need attention.

- (a) Field staff require adequate training.
- (b) Statutory regulations regarding the marking of boundaries are still needed. The proposed use of living marks near corner star pickets⁽¹⁾ will prove very advantageous (refer Appendix 7).
- (c) The survey of external boundaries according to the Regulations under the Survey Ordinance will necessitate cement markers every 10 chains. The Surveyor-General has suggested that blocks abutting the external boundaries with boundary dimensions a little less than 10 chains may have their corners marked. But where dimensions are a

(1) 28/1/66 "Proposed Step Structure for Land Tenure Conversion"

D.A.S.F. (Kone) Land Tenure Conversion File. Also refer to Appendix 7.

little in excess of 10 chains, the regulatory 10 chain marker must be placed and the corner must be marked by the subdivider. This has two disadvantages:-

(1) The semi-literate land holder may be confused as to the true corner: the steel picket or the cement peg 1-2 chains distant therefrom (cf. Para 4.2(iii)(d)).

(2) The subdividing surveyor is required to place a corner mark on the external boundary. His definition of this boundary will necessarily be less accurate than the authorised survey. A boundary dispute could arise in the future where a mark placed by the subdivider is outside the external boundary as marked by the authorised surveyor.

(d) Procedural and survey delays may prompt the Department of Agriculture, Stock and Fisheries to continue rough "cut up and mark" surveys in order to commence a scheme. Surveys could again be duplicated.

Such a situation could be avoided if the subdivisional survey is executed to such a standard that it could be used in conjunction with a later external boundaries survey.

(e) Registration of Blocks "Subject to Survey"

In October, 1965 the Land Development Board recommended that the Surveyor-General, Chief Commissioner and Registrar of Titles investigate the possibility of

accepting for registration, surveys by field staff, provided an external surround was executed by a qualified Surveyor.⁽¹⁾

The Chief Commissioner rightly considered that this matter should not be his concern⁽²⁾ and a meeting between the Assistant Surveyor-General and the Registrar of Titles was held. The recommendations of this meeting were, inter alia:-⁽³⁾

(1) That it was inconsistent to maintain a register with titles based on surveys of varying accuracies. That therefore, the order of accuracy would have to be lowered for all rural surveys.

(2) That by lowering the accuracy of all rural surveys, the security of title is impaired especially with respect to its borrowing power.

(3) The solutions to the survey problem are:-

(A) more field staff,

(B) more money for contract surveys.

(1) 6/10/65. Minutes of L.D.B. 58th Meeting.

(2) However, under the L(T.C.)O(Sec.13) it is the Chief Commissioner who must "insure that boundaries of land on a conversion plan are permanently identifiable on the ground".

(3) 5/10/65. Assistant Surveyor General to L.D.B. D.L.S.M.(Kone) Land Titles (Tenure Conversion) Ordinance File 63/1641.

These recommendations are based on assumptions which are Australian in origin and which are not necessarily applicable to New Guinea:-

- (1) There is no inconsistency in registering surveys of varying accuracies in the one cadastral register. The Australian cadastral concept of performing all cadastral surveys to the one standard of accuracy is not common. Even in some highly developed countries, different orders of accuracy are permitted for different land uses or values (e.g. Switzerland Netherlands).
- (2) Lowering the standard of accuracy does not necessarily impair title security. Security of title depends on:-
 - (A) A sound system of demarcation, including adequate reference and witness marking.
 - (B) A system of survey which will enable the particular land parcel to be mapped at a desired scale and the area to be known at a desired accuracy.
 - (C) A reliable system of recording ground data on cartographic registers.
 - (D) A system of relocating lost marks by survey. The accuracy of relocation is dependent on the value and use of the land and the mores of the people.

(3) The solutions proposed are unrealistic as it is quite apparent that the Administration is not prepared to commit itself to expensive survey costs. (refer Ch.8, Part 8 for alternative solutions).

(4) To issue a title "subject to survey and demarcation" with little likelihood of survey within a generation is to seriously detract security of tenure from the title (see Ch. 5,2.9)

The ultimate effect will be a title document divorced from facts on the ground. This appears to be a much more serious situation than that where parcels are adequately marked but surveyed to accuracies lower than those required in Australia.

.4 LAYOUT AND LOCATION OF SCHEMES

(i) Layout

Shape: Block shapes varied considerably in the early subdivisions (Table 9). When these blocks were extended in area to satisfy tenure conversion requirements, some unfortunate shapes resulted. For example, blocks in the Ahora scheme are approximately 4.5 x 40 chains and the access road is only 30 links.

The ideal block shape has been set as a rectangle with the ratio of sides between 1:1.5 and 1:3⁽¹⁾

(1) H.H. 31-1-9

Size: Block sizes are based on economic factors. An economically viable unit is such that returns \$1000-1200 net to the native farm family.

Sizes for the lowlands are:-

5 acres for subsistence
+ 10 acres for coffee or rubber
or + 12 " " cocoa
or + 20 " " coconuts

The layout has always been extremely simple. The road pattern is a grid system where possible.⁽¹⁾ Consequently subdivisional error propagation can be contained within road alignment surveys.

(ii) Location of Schemes

Schemes in the Northern District are widely distributed. This haphazard development will continue as it depends on the enthusiasm of the people. Therefore the integration of schemes into the survey system will necessarily be a demanding task.

(1) H.H. 31-1-9

.5 FUTURE SURVEYS : DEMAND, MANPOWER AND COST

(i) Demand

Requests for tenure conversion in the twelve months prior to 5/10/65 were at the rate of 111.5 applications per month.⁽¹⁾ This excludes those schemes which were shelved upon investigation. Based on this, the Department of Agriculture, Stock and Fisheries has proposed a five year programme for the conversion of 1000 blocks per year.⁽²⁾

This goal may not be attainable because of the following anticipated procedural delays associated with the Administrator's directive.⁽³⁾

(a) The seeking of approval of all schemes from Konedobu. (Administration Headquarters).

(b) The use of demarcation committees to determine clan boundaries.

(c) inadequate co-ordination between those Departments who will cut, mark, survey and map the boundaries.

(1) 5/10/65 A.O. (Smith) to D.A.O.(N.D.)
D.A.S.F. (Pop) Land Tenure Conversion Reports General File.

(2) D.A.S.F.(Pop) Land Tenure Conversion File.

(3) H.H. 31-1-9

(d) delays between the cutting of boundaries and the Land Titles Commission hearing may necessitate the recutting of overgrowth.

Interest in other Districts grew in 1964-65. For example, a request for tenure conversion from the Gulf District in 1964 covered 4,000 acres.⁽¹⁾

(ii) Manpower

Assumed demand rate, Northern District: 1000 blks/yr.
Assumed demand rate, other Districts : 1000 blks/yr.
Assumed rate of survey⁽²⁾ (see Table 13) 1 blk./F.O.man
day
Assumed number of working days : 240 days/yr.

Therefore minimum number of trained field officers required : 3/yr.

At least the equivalent number of assistant field officers would also be required.

(iii) Cost of Survey in Relation to Benefit

The cost of survey must be kept low because of the present low land value and the uncertainty of future value and use.

(1) 22/7/64 D.C.(Gulf) and L.T. Commissioner
D.L.S.M. (Kone) Land Titles (Tenure Conversion) Ord.
File 63/1641

(2) includes travel and delay times.

Reasons for the uncertainty of schemes are:-

(a) Feasability Studies by the Department of Agriculture, Stock and Fisheries are very cursory. The land capability survey is only based on a brief field inspection and aerial photographs.

(b) The motivation of the people to persevere with schemes is an unknown.

(c) Farmers are not selected for their suitability.

(d) The provision of credit facilities is not likely. (1)

(e) The provision of extension services, processing and marketing facilities, and of a basic infrastructure depends largely on the policies and priorities of several Departments.

.6 CONCLUSION

In January, 1964 the Federal Secretary of the Institution of Surveyors, Australia, notified the Minister for Territories of its concern for the issue of freehold titles "subject to survey" under Sec.17 of the Land (Tenure Conversion) Ordinance.

The Institution's fear that untrained staff would produce poor "sketch plans" has been realised to quite some degree.

(1) H.H. 31-1-9

The Land (Tenure Conversion) Ordinance fails to promote title security by not defining the qualifications of surveyors or the standards of survey and demarcation. Sec.8(2)(a) requires the Land Titles Commission to prepare a plan of conversion applications yet a qualified surveyor is not required as a member of the Commission (Sec.5)

The issue of freehold titles "subject to survey" is not in keeping with Ministerial policy which requires the New Guinea titles system to be "after the pattern of the Australian system".⁽¹⁾ In his reply to the Federal Secretary of the Institution of Surveyors the Minister suggested that registration of title "subject to survey" was practised by some Australian States. However, the issue of "provisional titles" in Australia is not comparable with "subject to survey" titles in New Guinea:-

(i) "Provisional titles" in Australia are an interim measure only, so that all land can be registered in the Torrens Registers.⁽²⁾ The survey of "provisional titles" is foreseeable within a generation.

(1) Policy No.1 Ref.85

(2) Ref. 142.

(ii) The boundaries of most land which is subject to "provisional title" are identifiable on the ground by physical features, especially fences.

The Federal secretary of the Institution of Surveyors suggested that the solution to the survey problem was for contract surveys to be executed within a control network established by the Department of Lands, Surveys and Mines. This solution would only be advisable if:-

(i) the Administration had ample finance for survey.

(ii) the success of tenure conversion schemes could be guaranteed.

(iii) the accuracy requirements of the "authorised" survey regulations (Ch.16) were necessary for all land.

4. FORMAL LAND SETTLEMENT

.1 GENERAL PROCEDURES

Refer Appendix 2.

.2 DUPLICATION OF SUBDIVISIONAL SURVEY

The survey of Land Settlement Schemes by both the Land Settlement Division and the Survey Division of the Department of Lands, Surveys and Mines is unsatisfactory from the following points of view:-

(i) Waste of finance and manpower.

This is particularly noticeable when the official survey follows almost immediately after the preliminary subdivision. (1)

(ii) Non-legal Status of Boundaries fixed in the preliminary subdivision.

The authorised surveyor is permitted to make minor variations in the design, provided substantial agreement with the marks placed in the preliminary subdivision can be reached. (2)

Examples of changes in boundary location as a result of the authorised survey are:-

(a) Poor location of a natural boundary in the preliminary subdivision. The authorised surveyor may either:-

- (1) permit the areas of blocks to change (3)
- or (2) alter the position of adjoining artificial boundaries so that design areas are maintained.

(1) Examples are the North Sangara and Arche Schemes.

(2) a statement common in survey instructions.

(3) For Example: Portions 440 & 331 Silanga Subdivision.

(b) Where the authorised surveyor decides to maintain the geometrical symmetry of the design (parallelism of opposite sides of blocks and roads).⁽¹⁾

(iii) Native Confusion Regarding Boundary Marks

The semiliterate lessee is understandably confused as to which is the true corner- the iron stake or hardwood post originally placed or the cement peg placed in the later survey.

The following case studies reveal the unfortunate consequences of the duplicate marking system.

Case Study 1 Por.237 to 241 Sorovi Subdivision (Northern District).

(a) Side boundaries of blocks had been moved by the authorised survey 30-60 feet east of their original position.

(b) The lessee of Por.241 had lost cocoa plantings to the lessee of Por.240. Both lessees were of the same tribal group and no dispute had arisen. However, neither lessee would say who would harvest the cocoa.

(1) For example - Pors. 551, 510, 509
Silanga Subdivision.

(c) A trade store operated by the lessee of Por.240 became located in Por.239.

(d) The lessee of Por.239 had lost plantings to the lessee of Por.238. Lessees were from different tribal groups and friction between them had built up over the boundary uncertainty.

(e) The lessee of Por.238 was prepared to forfeit his lost plantings to the lessee of Por.237. The lessees were from the same tribal group.

(f) Along the back boundary natives were further confused as there were three types of marks - the corner post placed in the original survey, the "new" cement pegs placed in the authorised subdivisional survey, and the "old" cement pegs which were line pegs placed every 10 chains when the boundary was originally surveyed.

Case Study 2: Laloki Market Gardens Subdivision
(Central District).

In the original subdivision the common back corner of four contiguous Portions (Por.216, 217, 222, 223) was made to fall in a large pool of water. Access to the water by the four lessees was important because of the scarcity of water. The authorised survey altered block shapes so that the pool was

wholly contained in Por.216.⁽¹⁾ Lessees were not aware that the boundaries had been so changed and considered that the water from the pool was available to the four Portions.

Indigenes cannot be expected to respect surveyors or survey marks if various types of marks are contradictory.

(iv) Unauthorised Redefinition of Boundaries

Prior to subdivision, the Land Settlement Officer is at times required to redefine the external boundaries of a parcel described in a Deed of Attestation or the Index of Unregistered Administration Land. Where this redefinition does not meet the satisfaction of the authorised surveyor the size and shape of settlement blocks might require alteration.

Example 1 Situm Scheme: An alteration in the definition of the southern boundary by the authorised surveyor was one of the main causes for a reduction in several block sizes, the loss of coconut plantings to some owners and the relocation of three settler's houses on adjacent blocks.⁽²⁾

(1) Laloki Land Settlement Division Plan & Plan 49/718.

(2) 10/6/64 Chairman of Native Loans Board to Dir. of D.L.S.M. D.L.S.M.(Kono) Land Settlement file 145/19 Port.2.

Example 2 Amboga Scheme. The south-eastern boundary of the scheme is the south-eastern boundary of the land comprised in Deed of Attestation 1225. According to the original purchase document this boundary remains a straight line where it cuts the Amboga River. However, there is now on the ground a 28 chain shift in the boundary at the Northern bank of the river. An authorised survey has not been executed to determine if the Settlement Scheme will suffer.⁽¹⁾

To avoid the duplication of survey, two alternative procedures were seriously considered in 1965⁽²⁾

(1) A survey of the external boundaries and road network by authorised surveyors. An internal subdivision by a Land Settlement Division Field Officer, supervised by an authorised surveyor. Kuriva subdivision was the first experiment.

(2) Full subdivision by an authorised surveyor at the outset where the implementation of the scheme is not urgent. Experimental cases, Pangalu, Bulu and Kobuna Schemes, indicate that at least one year elapses between the issue of a survey instruction and the availability of plans.

(1) Maps of "Sangara Milinch", Sangara Settlement Area, and chain and compass survey of D.A.1225 in 1958.

(2) 28/5/65 L.S.O. to O.I.C. L.S.(N.B.) D.E.S.M.
(Rab) L.S. Instructions File 1965.

.3 THE REGISTRATION OF SUB-LEASES AND THE CREATION OF
EXTRA-LEGAL RIGHTS.

A lessee who wishes to sub-lease his land must

(i) apply to the Administrator (Department of Lands, Surveys and Mines) for approval, under Section 75 or 77 of the Land Ordinance,

(ii) arrange for a sub-lease document to be drawn up and registered at the Department of Lands, Surveys and Mines.

Although lessees may be assisted by Administration officials, where available, it is feared that non-approved and non-registered rights will develop over leasehold land. Simple verbal negotiations at local registries and land offices is the only practical solution. (cf. Ch.5, Para.2.7(v)).

.4 SURVEY OPERATIONS

(i) "Authorised" Surveys

Refer Chapter 16.

(ii) "Unauthorised" Surveys by the Land Settlement
Division Staff.

(a) Qualifications of Field Officers

Previous experience or training in surveying is not required. Upon employment, each field officer is given a short course in surveying at Head Office and a briefing by an experienced field officer in the field.

(b) Equipment

Prior to 1964, army compasses were generally in use. Since then improved compasses have been used. The Wild compass has been found very successful but an extra labourer is necessary to carry the instrument and tripod.

(c) Method

Lines are cleared of scrub and trees up to 1 foot trunk diameter -measurements are made along the ground. Horizontal deformation around trees is permitted. An error of 2-3% in linear measurement can generally be expected.

Forward and back bearings are taken at each Station. In this way a check on local magnetic attraction can be made.

(d) Accuracy, Adjustment and Checks

Chain and compass accuracy requirements used to be 1:500, but now are 1:300. Frequently the misclose is not adjusted. The Bowditch method is used occasionally. The only check on the survey is the plot itself.

(e) Field Books

Field books are kept at Department of Lands, Surveys and Mines District and Sub-District Offices. They are not public.

Booking methods vary from field book to field book. There is a standard field book procedure but it is not rigidly followed by officers. Title pages, date of survey and signature of field officer are often missing.

(f) Plans

Plans of Land Settlement Schemes are kept at Head Office either in the plan room under the Miscellaneous Plans Register or in the Land Settlement Office under the Land Settlement Section Map Register.

Plans of subdivision are required to be examined after plotting. (1)

(g) Monumentation

In the early schemes, hardwood posts about 3 feet long were used at corners. Reference trees were frequently cut.

In June, 1963, the Department of Lands, Surveys and Mines standardised the marks to be used, by Land Settlement officers:- corners of land purchases: wooden post in cairn of stones or mound of earth, or land purchase cement peg.

subdivisions: 5'6" steel star pickets with galvanised labels and numbered shield trees. (2)

The nature of marks is often omitted on plans

(1) Land Settlement Instruction 2/64

(2) Ref.123

.5 FUTURE SURVEYS : DEMAND AND MANPOWER

It is assumed that the target of 1,500 blocks per year (Ch.4, Part 4) will at least be maintained. Assumed rate of survey: 1 block/man day (see Tables 4 and 5)

(Where one man day is one day's labour by a field party leader or superior)

Assumed working days : 240 / yr.

Estimated minimum number of field party leaders and superiors : 6 - 7 / yr.

.6 COST OF SURVEY IN RELATION TO BENEFIT

(i) Cost of Survey as a Percentage of Initial Scheme Costs. (1)

Scheme	Cost of Preliminary Subdivision by Land Settlement Division	Cost of Authorised Survey (estimate)
Bailebo (2)	1.4%	12.2%
Uasilau (2) (3)	.4%	13.8%
Marshall Lagoon - Abau (4)	10.8%	(5)
North Coast of New Britain (4)	8.2%	(5)

It is possible that the percentage costs for the authorised survey could be higher as the estimates used, footnotes (2) and (4) are below average. (refer. Table 15)

- (1) Initial costs cover the following contingencies:
D.D.A. Patrol expenses, land purchase price,
survey, D.A.S.F. settling of settlers, roadage,
wharfage, miscellaneous expenses by Valuation
Section, L.D.E., L.S. Division, publicity.
- (2) D.L.S.H. (Kone) L.S. File-Costing. Cost of
authorised survey estimated at \$6/acre.
- (3) Costs not included: D.D.A. Patrol, L.D.E.,
drafting, advertising, D.A.S.F.
- (4) Ref. 2. Figures are based on estimate of
\$100/block for authorised survey.
- (5) Combined Cost of Preliminary subdivision
and Authorised Survey.

(ii) Justification for High Cost of Survey

Although the cost of survey is only 10-15% of the initial outlay, and only 3-5% of the total capital investment over a 25 year period, ⁽¹⁾ it is difficult to justify such expenditure when:-

(a) Other surveys are being executed by unqualified surveyors without qualified supervision.

(b) the establishment of a Second and Third Order Control Network should be actively pursued.

(c) the authorised surveys are executed to impeccable Australian standards (Ch.16) which do not appear necessary. In particular, the accuracy and methods of field operations and the finesse of computation and plan presentation appear unwarranted.

(d) the success of Land Settlement Schemes is uncertain for the following reasons: ⁽²⁾

(1) Insecurity of Title

The leasehold title from the Administration/Crown is a valid legal document. However, security in the absolute sense depends on the "root of title", that is, the Administration's/Crown's title to the land.

(1) Ref.2

(2) This summary is based on discussion with E.S. officers, D.D.A. officers, and Research workers. It is subject to authoritative investigation.

In recent years, the Administration's/Crown's title has been increasingly challenged. (Ch.3, Part 9; Appendix 5).

(2) Poor Land Capability

Some settlement schemes are suffering because of the inadequacy of the land to support commercial agriculture. This has been caused by:-

(A) The inadequacy of the feasibility studies

For example: (1)

Serovi Scheme: It is anticipated that 60-70% of the settlers will be moved.

East Amboga Scheme: 20% of the settlers to be moved.

(B) Expedient settlement on land considered unsuitable:

For example: Kokada Scheme, Savaia Scheme. (2)

(3) Possible Change in Land Use.

Studies of natural resources are not carried out prior to the introduction of a settlement scheme. It can be expected that some schemes may have to give way to mineral development. Such a situation has already arisen in the case of the Uasilau Scheme. 80% of the blocks may need to be abandoned because of a mining permit issued to Conzinc Riotinto, Australia.

(1) Estimates by D.A.S.F. staff. (Pop.)

(2) The Investigation Reports. D.L.S.M. files (Pop.)

(4) Inadequate Selection of Settlers

(5) Inadequate Scheme Implementation

No trained settlement officers are provided. The provision of extension, credit, infrastructure and social facilities is slow. (1)

The compliance with lease conditions is seldom reviewed.

.7 LOCATION AND LAYOUT OF SCHEMES

(i) Location

Priority (Ch.4, Part 5) areas have been set as:- (2)

1. Wahgi Valley
2. West Coast of New Britain - Makanai
3. Northern District (Kokoda Valley in particular)

This policy lends itself to a more systematic approach to survey operations. The integration of surveys is possible if low order control in these three areas could be established.

(1) 5/6/63, 4/2/64 O.I.C. D.A.S.F. Malasca to Sen. A.O. (Rab.)
D.L.S.M. (Rab.) L.S. file: Land Development 11-22
5/10/64 O.I.C. L.S.(N.B.) to D.C.(N.B.)
D.L.S.M. (Rab.) L.S. General Correspondence File

(2) 56th Meeting of L.E.B. 19/2/65.

(ii) Layout

The shapes of the land tracts used for early schemes frequently inhibited the most efficient and economical design.

Irregularly shaped blocks were not uncommon, (e.g. Por.101, 109 Komondo Scheme), and blocks often fronted one side of a road only, (e.g. East Amboga and Isaveni).

The symmetry of layout of the large schemes, now being implemented offers the following advantages to survey:-

(a) The cost of survey is less because of the ease in subdividing symmetrical blocks and less roadage per block.

(b) Because of the simplicity of the internal layout, technicians can be used to advantage.

(c) The survey of the road alignment serves ideally as a control survey.

.8 CONCLUSION

(i) The failure to find a solution to the duplication of subdivisional surveys by the Land Settlement Division and Survey Division has caused unnecessary confusion and wastage of effort and finance. As early as 1961 a suggestion was made that "authorised" surveyors could be used for the survey of external

boundaries and Land Settlement field officers to execute the internal subdivision.⁽¹⁾ Only in 1965 was this procedure first experimented with.

(ii) The creation of extra legal rights over leasehold titles can only be minimised by the use of local settlement officers or registry inspectors.

(iii) The cost and finesse of the "authorised survey" is disproportionate to present and future needs.

(1) Appendix 7 "Report on Land Settlement in the Gazelle Peninsula" D.L.S.M.(Rab.) L.S. file 11-19-1.

5. TENURE RATIONALISATION FOR FORESTRY DEVELOPMENT

The Administration is pursuing a progressive programme of forest exploitation. Because of the difficulty and expense of outright land purchases, the Department of Forests is concentrating on the purchase of timber rights only. Duration of timber rights is usually forty years.

In timber rights purchases, only a particular right of use is rationalised. Other rights, including sovereignty remain with the native owning group.

The rationalisation process almost reaches a point of absurdity where the Administration purchases forestry rights from a people to whom in turn a logging permit is issued. (1)

.1 REGISTRATION OF TIMBER RIGHTS AND LOGGING PERMITS

The purchase of rights documents and the permit to log documents are registered at the Department of Forests. Documents are private and not available for public searching.

.2 SURVEY OF PURCHASE OF RIGHTS AND LOGGING PERMITS.

Method: Chain and Compass

Field Books and Computation Sheets: The column method is used extensively. Field books are usually well presented and legible.

(1) e.g. Wairiki timber rights Purchase Area known as "OLON", south of Kokopo.

Monumentation: Permanent marks were introduced in about 1961. They are placed at 10 chain intervals along roads and 20 chain intervals along boundaries. However, recent instructions permit permanent marks up to 40 chains apart.⁽¹⁾ Difficulty has been experienced with natives removing permanent marks and a recent trend in purchase of rights surveys has been to use natural boundaries. Reference trees are used at all corners.

Control: Where possible, chain and compass surveys are tied in to the compass - theodolite survey which is used for photogrammetric control and road alignment.

Calculations: Mathematical computation of misclosure is executed on hand calculating machines. The misclosure is distributed by the Bowditch method.

.3 CONCLUSION

(i) The Department of Forest's cadastral surveys over native land are well planned, reasonably well monumented, and controlled where possible.

These survey operations are the only ones outside the control of the Division of Surveys of the Department of Lands, Surveys and Mines which tend to fulfil basic fundamentals of cadastral surveying.

(1) Ref. 67

(ii) When the native land is registered under the Real Property (Communally Owned Land) Ordinance or the Land (Tenure Conversion) Ordinance, the timber rights purchase and subsequent logging permits should be registered against the land.

The duplication of registries in various Government Departments should be avoided. (Ch.13 Part 1)

General References

2, 25, 44, 45, 46, 47, 48, 52, 101, 102, 129, 131, 134, 145, 149, 188, 196, 226, 227, 228.

CHAPTER 7THE FORMALISATION OF CUSTOMARY TENURE

Traditional tenurial arrangements can be formalised in two ways:-

(i) If a dispute arises, an enquiry by the Land Titles Commission (previously the Native Land Commission) will result in a determination. This process is sporadic in time and location.

(ii) Disputes can be avoided by the registration of all native rights by means of systematic adjudication over the whole country.

1. NATIVE LAND COMMISSION ADJUDICATIONS

.1 Determinations

Determinations were sporadic. A determination of a Native Land Commission was called a "finding". The finding was filed in a bound volume under the Claim Number. This volume contained details of all the investigations and proceedings:-

- (i) events leading to enquiry,
- (ii) the enquiry - affirmations by disputants and witnesses,
- (iii) summing up by Commissioner,
- (iv) finding of the Native Land Commission,

(v) Schedule 1 - List of living descendants of disputants' groups (this could be thirty or more foolscap pages in length).

(vi) Schedule 2 - Genealogy of disputants' groups. (this could be over 100 foolscap pages in length).

.2 Publicity of Findings and Survey Information.

Native Land Commission findings, including the plans, are not public documents. A copy of each finding is held by the Registrar of the Land Titles Commission and a second copy was presented to the natives concerned. Although the "findings" were not registered by the Registrar of Titles, they are a form of title document. Copies have at times been sent to Sub-District and District Offices of the Department of District Administration.

Field books are also not officially available to the public.

.3 Plans and Their Use

The plan was not commonly used as the primary description of the land. In some cases the plan was only a 2 inch x 2 inch sketch. (1) It appears that the Native Land Commission preferred verbal to graphical descriptions. (2)

(1) For example, Central Claims 110-117

(2) For example, Central Claims 106, 107, 108.

Plans were frequently inadequate in one or more of the following:- omission of scale and/or north point, inconvenient scale, irregular plan sizes, no signature or declaration by the surveyor, poor title headings.

.4 Survey Practice

The Native Land Commissioners were legally not obliged to survey claims but, out of necessity, they usually did. The Native Land Commission Ordinance provided for surveys to be executed by a "qualified surveyor". (Part 5 N.L.R.O.) By 1958 no such surveys had been executed but it was still the intention of the Administration to use qualified surveyors for the task. Recruitment of survey staff was said to be underway. (1)

Prior to 1956 some surveys in the Central District were executed (by the then Chief Commissioner) with compass theodolite. Thereafter, the chain and compass method was used exclusively.

.5 Datums of Surveys

Surveys were of an isolated nature. Frequently datums of early surveys were not sufficiently permanent.

Native Land Commissioners did improve in their selection of datums. Department of Lands, Surveys and Mines survey marks were used where possible. Otherwise a substantial mark (natural or artificial) was sought. (2) It was not uncommon for the marks of former Commission surveys to be used as

(1) A.R.(N.G.) 1957-58

(2) Survey of Central Claims 110-117

datums in later surveys (similar to the Australian pattern). Propagation of error has been inevitable.

.6 Monumentation

In the early surveys, steel star pickets were used almost exclusively. At the end of 1956 "round cements" were introduced and became widely used. Reference and witness marks were not used.

Commissioners generally placed importance on corner marking and boundary clearing. However, as there were no regulations regarding monumentation, each Commissioner developed his own approach.

.7 Field Books

Field data was not recorded in any prescribed manner. Commissioners used methods which they found most suitable to themselves. Invariably field books are difficult to read.

.8 Boundary Redeterminations.

The Native Land Commissioners were not trained or authorised to carry out boundary retracement surveys. However, cases have occurred where a disputed area adjoined Administration/Crown land held under a Deed of Attestation or Unregistered Administration Land Deed. As described in Appendix 5, the monumentation and survey of these parcels has been very poor.

Due to lack of survey staff in the Department of Lands, Surveys and Mines, Native Land Commissioners have, at times, redefined boundaries of these parcels. Such surveys have no legal status.

2. LAND TITLES COMMISSION SPORADIC ADJUDICATIONS

.1 Determinations

The decision of the Land Titles Commission is kept separate from all other investigational and procedural material. Details of the investigations are recorded in the minutes of the hearings. Genealogy investigations are kept in genealogy registers at most Land Titles Commission offices. Thus the final decision of the Commissioner is kept in a concise form separate from the details of the case.

The Land Titles Commission has strived to restrict its functions (especially survey) to what it legally is: an independent judicial authority to arbitrate over land questions. However, frequently the Commissioner has been obliged to carry out investigations himself prior to the hearing. The Land Titles Commissioner of Morobe District admitted that most of his time is still spent in obtaining genealogies which are necessary to decide the cases before him.

The decision, plan, original application and other administrative material are loosely stapled to a manila folder and filed under the Application Number. Where the decision is not registered with the Registrar of Titles, this file serves as the only title document. More care should be taken in the protection and binding of such title documents.

.2 Publicity of Findings and Survey Data.

Land Titles Commission decisions and findings are held by the Commission and officially are not public records. Copies of all Land Titles Commission decisions are sent to:-

- (i) Sub-District Office of Department of District Administration.
- (ii) Disputants.
- (iii) Department of Lands, Surveys and Mines if the Administration is involved in the dispute.
- (iv) Registrar of the Land Titles Commission.
- (v) Registrar of Titles if they affect him. (e.g. Tenure Conversion).

Survey data is not readily available for public searching.

.3 Plans and Their Use

The plan has been used as the primary description of the land. (1)

Notwithstanding the above, the policy of the Land Titles Commission since March 1965 "is to facilitate, not to obstruct, the hearing and determination of applications" (2) To this end, "owing to the diversity of conditions existing throughout the Territory, the requirements of the Rules (Consolidated Land Titles Commission Rules, March 1965) must, on occasions, be relaxed e.g. (i) the Statutory Declaration (by the surveyor) with the Application may be waived by a Deputy Commissioner or a Commissioner under Rule 17 (ii) it may be practical to dispense with survey". (2)

Therefore surveyed plans may not be used as extensively in future decisions.

Between 1962 and 1965 there was a steady improvement in plan standard. On 3/2/65 the Land Titles Commission adopted uniform plan sizes and forms. However, data shown on plans is frequently incomplete. Information such as the date of survey, name of surveyor, standard of accuracy,

(1) Verbal descriptions do occur, e.g. L.T.C. Decision 1965/147

(2) 14/10/65 Chief Commissioner to Sub-District Registrars "Procedure in Land Titles Commission Applications".

description of monuments, field book reference are frequently missing.

The status of plans as legal documents is impaired by:-

- (i) The surveyor's certificate may be waived.
- (ii) The survey is not executed according to statutory standards.
- (iii) The "surveyor" does not need to possess a statutory standard of proficiency.
- (iv) Field and office data are not adequately filed for future reference.

.4 Survey Practice

In contradistinction with the Native Land Registration Ordinance, the Land Titles Commission makes no provision for the standard of survey or qualifications of surveyors.

The statutory standardisation of survey practice is important because:-

- (i) Most Commissioners now refuse to execute surveys.
 - (ii) After January 1966 the Land Titles Commission will not have its own field staff (Chapter 6 Para 3.3(iv))
- Therefore various agencies and individuals will be required to provide the plan of survey.

.5 Datums

Official survey marks or natural or artificial features are still used where possible. As no regulations apply, these are only used where readily available. As a result of the Consolidated Land Titles Commission Rules, March 1965, less care is being taken with adoption of datums.

Because of poor datums, confusion has arisen at times over the exact location of parcels which are the subject of claims. Where it has been necessary for the Land Titles Commissioner to ensure there is no encroachment on alienated land, the location of a disputed parcel is particularly important.

.6 Monumentation

Because of expediency and cost, less emphasis has been placed on the use of round cements in recent years.

.7 Field Books.

Field books of Land Titles Commission field staff resemble the Native Land Commission and Department of District Administration field books. Methods of recording still vary, but the column method is preferred. They are illegible at times and inadequately filed for ready reference.

3. PROGRESS IN SYSTEMATIC ADJUDICATION AND DEMARCATION

.1 Rakunat Adjudication Area. (N.B.I.)

Rakunat was the first test case of systematic adjudication and demarcation in the Territory.

(i) Committee

The Demarcation Committee was gazetted on 2/1/64.

A senior surveyor of the Department of Lands, Surveys and Mines was chairman for approximately 8 months and an officer from both the Department of District Administration and the Land Titles Commission attended meetings.

The Committee completed its task on 31/5/65.

(ii) Time Limit on Claims

The initial time limit was 3 months. This was extended twice.

(iii) Procedure

(a) Early procedure (1) was:-

(1) Each vunatari (clan) was to mark its own land with steel pickets (supplied by the L.T.C.)

(2) In the case of disputes, the Demarcation Committee attempted to resolve the case. Where unsuccessful, both boundaries remained marked and awaited a Land Titles Commission finding.

(1) From Minutes of 1st, 2nd and 3rd Meetings of Rakunat Demarcation Committee.

(3) When the plan was made available, Commissioners were to decide all disputes and direct all pickets to be replaced by cements. (L.T.C. round cements).

(4) The Administration was to bear the cost of cements and pickets.

(b) Modifications to procedure

After approximately April 1964⁽¹⁾ rightholders marked their boundaries with sticks. In the case of undisputed boundaries, the Demarcation Committee authorised the planting of cements in the presence of the claimants to the land. In the case of disputed boundaries, it authorised the planting of steel pickets.

Cements and pickets were placed by Land Titles Commission indigenous field assistants who accompanied the Demarcation Committee.

(1) Meeting of Rakunat Demarcation Committee 3/4/64 and letter Senior Surveyor (N.B.) to Principal Surveyor (N.G.I.) 28/8/64. D.L.S.M. (N.G.I.) file 11-23-1.

(iv) Co-operation of People

The Tolai people have had many unsavoury clashes with the Administration over land. The people were suspicious of this venture at first.⁽¹⁾ They feared that this might be a new way of the Administration gaining more of their land. Land Titles Commission, Department of District Administration and Department of Lands, Surveys and Mines officers vouchsafed on many occasions that the Administration was not intent on acquiring further land.

(v) Survey

At the 1963 Staff Surveyor's Conference it was insisted that the survey associated with demarcation be handled by the Survey Division of the Department of Land, Surveys and Mines to enable licensed staff surveyors to exercise control over all title surveys in the Territory.

The Chief Commissioner of the Land Titles Commission also desired the survey to be carried out by the Department of Lands, Surveys and Mines.⁽²⁾

(1) Senior Surveyor (N.B.) to Principal Surveyor (N.G.I.) ibid

(2) 9/8/63 Chief Commissioner to Director D.L.S.M.

D.L.S.M. (Rab.) Land Settlement file 11-19-4,

(a) Intended Survey Procedure:-

(1) Theodolite (20") and steel band survey of the boundaries of the Adjudication Area and a control network within by a Department of Lands, Surveys and Mines Assistant Surveyor.

(2) Compass and chain survey of individual parcels and connected to the control by Land Titles Commission field assistants. Just prior to the formation of the Demarcation Committee the Senior Surveyor (N.B.) gave lessons in elementary surveying to LandTitles Commission native field assistants. (1)

(b) Modifield Procedure

Magnetic anomalies in compass bearings of up to 6° were found. (2)

Every parcel was surveyed by a Department of Lands, Surveys and Mines Assistant Surveyor to an order of approximately 1 in 2000 with theodolite and band.

(1) L.T.C. Commissioner (N.G.I.) to Chief Commissioner 18/9/63. D.L.S.M. (N.G.I.) file 11-23-1.

(2) small army type hand compasses were used.

By January 1965 the survey had been completed except for small areas unmarked or unadjudicated. The work involved one Department of Lands, Surveys and Mines Assistant Surveyor for approximately one year. The largest computed mathematical misclose was 1 in 2000 and highest angular misclose was 5 minutes, average linear misclose was about 1:4000 and angular misclose about 2-3 minutes.⁽¹⁾

Causes for slow progress in survey:-

- (1) all boundaries were surveyed by theodolite and band .
- (2) survey could not be executed systematically, (block by block) as the demarcation of parcels was sporadic in time and location.

Prints of the plan of survey of a major part of the Adjudication Area were submitted to the Principal Surveyor (N.G.I.) on 7/10/65.⁽²⁾ There was no examination of the plan of survey by Department of Lands, Surveys and Mines examining draftsmen.

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- (1) Senior Surveyor (N.B.) to Principal Surveyor (N.G.I.)
7/10/65 D.L.S.M.(N.G.I.) file 11-23-1.
 - (2) Senior Surveyor (N.B.) to Principal Surveyor (N.G.I.)
D.L.S.M. (N.G.I.) file 11-23-1.

The plan was incomplete in that:-

- (i) not all boundaries were surveyed. The Land Titles Commission completed the survey in 1965.
- (ii) At least 21 cases were found where information on the plan had been omitted or was ambiguous. The most common cases were the omission of position of boundary lines between parcels and omission of measurements of boundary lines.

The Land Titles Commission has surveyed all other demarcation areas. Reasons for this administrative change were:-

- (1) The Land Titles Commission was disappointed with the rate at which the Department of Lands, Surveys and Mines survey of Rakunat was executed. The Land Titles Commission believes that accuracy must be sacrificed for speed and cost.
- (2) It was apparent to the Land Titles Commission that although Department of Lands, Surveys and Mines staff had desired to undertake survey operations, Department of Lands, Survey and Mines Headquarters showed little interest in the venture. Despite requests⁽¹⁾ by its New Guinea

(1) Senior Surveyor (N.B.) to Principal Surveyor (N.G.I.)
7/10/65, 26/8/64 ibid.

Islands Division with respect to policy directives on the nature and form of the cadastral plan and accuracy of the survey, Department of Lands, Surveys and Mines Headquarters gave no lead. The Department of Lands, Surveys and Mines primary commitment is to carry out the Administration's formal Land Settlement Policy. It was apparent to the Land Titles Commission that demarcation surveys could not be given high enough priority.

(vi) Unresolved Issues

The following issues were raised by the Rakunat Demarcation Committee but remained unresolved.⁽¹⁾

(1) Under the Land Titles Commission Ordinance the Demarcation Committee has powers to arbitrate but not to make rulings. The work of the Commission would be streamlined if the Committee had power to adjudicate subject to appeal.

(2) From a survey point of view it is preferable for the adjudication area or sub-areas to be fully marked prior to survey. A systematic survey, block by block could then be executed.

(1) D.L.S.M. (N.C.I.) discussion with Chief I.T.C.
Commissioner 22/9/64. File 11-23-1.

(3) The rightholders should contribute to the cost of survey marks, say 20 cents for cement.

(4) Committee members should be paid for their services.

.2 Matupit Island Adjudication Area, N.B.2

Matupit Island Adjudication Area was the second test case.

(i) Committee

Established: 19/12/63

Gazetted: 2/ 1/64

Initially the chairman of the Committee was a Department of District Administration official. In the gap of nine months between the 10th and 11th meeting⁽¹⁾, Land Titles Commission policy changed. The Committee was made all native and the chairman was one without land claims or kinship affiliations in the Adjudication Area.

(ii) Time Limit on Claims

Initial time limit: 19/12/64,

1st extension to: 30/ 6/65,

2nd extension to: 31/12/65.

(iii) Procedure

Same as Rakunat modified procedure.

(1) 10th Meeting : 14/1/65, 11th Meeting : 28/9/65.

(iv) Co-operation of People

Initially, enthusiasm was high. However, by 16/10/64 many claims had not been made. A circular was sent to all villagers. Response was fair. A similar circular was sent on 14/1/65 in which the people were warned that if their land was not marked, the Administration could claim it as vacant land. This statement seems contrary to the assurances given to the Rakunat people. (see Para. 3.1 (iv)).

(v) Survey

Supervision of cement planting began on 7/9/64 by a Land Titles Commission field assistant. A european field officer began survey of blocks with a compass-theodolite (Wild T.O.) during September 1965.

A separate surround survey was carried out for each individual parcel. Thus, most boundary dimensions were checked. The T.O. was used as a theodolite because of magnetic anomalies. Intermittent magnetic checks on bearing were made.

(vi) Suggested Modifications to Procedure

At its 7th Meeting, 15/10/64, the Committee agreed that:-

- (i) it should be empowered to decide claims finally, subject only to specific appeal to the Land Titles Commission. (The Chief Commissioner

had agreed to consider an amendment to the Ordinance on 22/9/64⁽¹⁾).

(ii) an honorarium should be paid to members of the Committee.

(iii) the chairman should be a native without land claims or affiliations to the Adjudication Area.

(iv) a fee for cement marks should be levied.

(v) a Department of Native Affairs officer should be on the Committee.

.3 NANGA NANGA ADJUDICATION AREA (N.B.46)

This was the third test case.

(i) Committee

Gazetted: 23/7/65

1st Meeting: 15/8/65

The Committee was all native. The Chairman was not from Nanga Nanga.

(ii) Time Limit on Claims

Initial Limit: 31/12/66

(iii) Procedure.

As per Rakunat modified procedure.

(iv) Co-operation of People

Initial enthusiasm has been high. Ten meetings of the Demarcation Committee had been held by 13/1/65.

(1) D.L.S.M. discussions with Chief Commissioner 22/1/64
D.L.S.M. (N.G.I.) file 11.23-1

(v) Survey

Again, a change in survey operations occurred. The survey of individual parcels was commenced in December, 1965. Two indigenous parties were using chain and compass to a linear accuracy of at least 1 in 200. A total surround of each individual parcel was executed, consequently most boundary dimensions were measured twice.

The survey was executed as blocks were demarcated. Consequently, survey was sporadic.

Simultaneously, a european field officer was establishing an elementary control network along main thoroughfares by traverse with a Wild Compass Theodolite (T.O.). No correction was being made for temperature, sag, tension or standardisation of steel bands.

:4 Adjudication and Demarcation Procedures from January, 1966.

Following the experience at Rakunat, Matupit Island and Nanga Nanga, the Chief Land Titles Commissioner formalised adjudication and demarcation procedures in January, 1966.

Important features of the procedures are:-

(i) Demarcation Committees have the power

(a) to resolve disputes

(b) to fix a time limit within which disputed

boundaries should be referred to them.

(ii) Demarcation Committees have the power to function as soon as they are legally constituted.⁽¹⁾

(1) Sec. 21 (1) L.T.C.O. requires the Demarcation Committee to begin to function "as soon as practicable after the expiration of the period" for claims.

(iii) Demarcation Committees will apparently be permitted to work sporadically within Adjudication Areas. Possible reasons for this policy are:-

(a) Natives might react against systematic demarcation as being coercive. Sporadic demarcation enables a native to participate when he feels ready.

(b) Systematic demarcation requires a planned approach to the whole undertaking. An all native Committee would not have the necessary administrative or methodological know-how.

The consequences of compulsory sporadic demarcation are:-

(1) The rate of demarcation will be slower than by a systematic procedure:-

"And there is, we think, irrefutable experience now to show that this (system of systematic compulsory adjudication) is the only procedure which will enable the compilation of the Land Register of any considerable and complex territory to be carried out in pursuance of a projected programme and with the economy and expedition which only methodical and controllable operations can secure" (1)

(1) pp.44-45 Ref.57

(2) The ultimate cost will be greater. "The difference in economy of effort, cost and time between the sporadic and systematic introduction of the system cannot be gauged, as it is dependent upon so many and much varying factors; but even under the least detrimental conditions it must obviously be very great".⁽¹⁾

(3) Survey will necessarily be sporadic also. This will be detrimental to the cost of survey and the integration of surveys.

(.4) The Demarcation Committee is to be elected by the people. There is no proposal for administrative assistance to Committees in the form of Demarcation Officers.

(1) P94. Ref.57

4. THE CREATION OF A NATIONAL CADASTRE

.1 Factors Aiding the Creation of a National Cadastre

The Chief Commissioner has shown a determined effort since March, 1965 to promote systematic adjudication and demarcation.

(i) By April, 1966, the proclamation of all Adjudication Areas in the Territory had been completed. It is anticipated that some Adjudication Areas will be subdivided into more manageable areas as demarcation proceeds.

Tight dead lines have been set for the submission of claims.

(ii) By January, 1966, forty five Demarcation Committees had been gazetted or were awaiting gazettal.

(iii) Both sporadic and systematic adjudication will be accelerated by the Land Titles Commission Ordinance, 1965 ⁽¹⁾ This Ordinance permits the appointment of Deputy Commissioners with the judicial powers of a Commissioner.

(iv) The Land Titles Commission has established a training centre for Land Officers (indigenous surveyors) in Rabaul. (Chapter 6).

(1) L.T.C. Ordinance 1965, amendment to L.T.C. Ordinance 1962 No. 43 of 1965.

.2 Factors Hindering the Creation of a National Cadastre.

(i) Top Level Policy

(a) Universal Register of Individual Titles Only.

The long term objective of the Department of Territories in the creation of a universal register of individual titles over all native land. The Register of customary rights under the Land Registration (Communally Owned Land) Ordinance is only temporary.⁽¹⁾

However, the individualisation of tenure over at least 50% of the surface area of the Territory is illusory, unnecessary and unforeseeable. (Chapter 13, Part 1.2)

(b) Preference Toward Sporadic Adjudication

The Minister for Territories gave the following sporadic adjudications top priority in Land Titles Commission work:-

- (1) Claims by the Administration that certain land is ownerless.
- (2) Rights investigations of native land being purchased by the Administration/Crown.

(1) Refer 85.

(3) Settlement of disputes between natives

(4) Investigations for tenure conversion.

Systematic adjudication is only to be undertaken when Commissioners are not taken up with items (1)-

(4). (1)

(ii) Inadequate Resources : Staff, Finance, Equipment

At September, 1964 (2) staff of the L.T.C. was:-

Commissioners	10
Expatriate field officers	3
Field assistants	16
Trainee field assistants and labourers	16

At January 1966 the situation had hardly changed. The number of expatriate field officers was 5 and the number of indigenous assistants approximately the same.

The Land Titles Commission is an independent body outside the control of the Public Service Commissioner. Land Titles Commissioners are not Public Servants. They are appointed by the Governor-General and have a similar status to that of a Judge. As the Public

(1) Ref. 85

(2) P.N.G. House of Assembly Debates Vol. 1, Sept, 1964.

Service Commissioner has no direct responsibility to the Land Titles Commission, all resources are made available through the Department of Law. It has been particularly difficult to obtain adequate surveying staff and equipment through this channel.

Since the introduction of the Land Titles Commission Ordinance, the Department of District Administration has become increasingly obliged to carry out pre-hearing investigations and survey. By March 1964, after only one year of operation under the Land Titles Commission Ordinance, the Department of District Administration Sub-District Office at Ra baul had a seven month back-log in Land Titles Commission work. Six indigenous field assistants were urgently requested.⁽¹⁾

(iii) Inadequacy of Administrative and Technical Machinery.

The following administrative and technical machinery has not been adequately provided for by the Land Titles Commission Ordinance (Chapter 5, 2.6) or by any other Act or policy directive.

(a) Pre-hearing Investigations

A cadre of trained Inspectors is necessary for:-

(1) 24/3/64. A.D.O. (Rab.) to D.O. (N.B.) file
35-16-1 Sub-District Office Rabaul.

- (1) The collection of evidence.
- (2) The determination of customary rightholders
- (3) The determination of local land custom.

These could be employed by:- Department of District Administration, Land Titles Commission, Local Government Councils or a Land Tenure Authority.

(b) Survey

A cadre of trained surveyors could be employed by:- Department of Lands, Surveys and Mines, Department of District Administration, Local Government Councils, A Surveying and Mapping Authority or a Land Tenure Authority.

(c) Counsels for Hearings

In 1965 the Land Titles Commission Ordinance was amended so that an officer of the Public Service or "other person who has first obtained the leave of the Commission" as well as a barrister or solicitor may represent a disputant in a hearing.

However, a cadre of trained sub-professional counsels must be employed by the Department of District Administration, Land Titles Commission, Local Government Councils, Department of Law or a Land Tenure Authority.

(d) Executive Assistance for Demarcation Committees.

Demarcation officers could be employed by Department of District Administration, Land Titles Commission, Local Government Councils or a Land Tenure Authority.

(e) Recording of Rights and Land Custom.

The value of much of the Department of District Administration and Land Titles Commission investigations into traditional rights, rightholders and land custom has been lost because of inadequate recording procedures.

Genealogy registers have been established in most Land Titles Commission Offices. These registers are unofficial and are not widely used by other Government agencies. The embarrassing situation has arisen where the Department of District Administration has negotiated a land purchase with the incorrect owners whilst the Land Titles Commission genealogy register had record of the correct owners. (1)

(1) Purchase of an area for the Vulcanological Division of the Department of Lands, Surveys and Mines near Rabaul in 1965. Fortunately the Administration retrieved the \$1600 purchase money.

Department of District Administration offices often have crude filing systems of genealogies and land customs. All District Officers and Patrol Officers are required to make themselves acquainted with native customs, reduce them to writing, and record them at the District Offices.

The ultimate creation of a national cadastre would be facilitated by officially recording the following information when it is collected by government agencies, research workers, missions and private individuals:-

(1) Native Land Law and Custom (1)

It is admitted that in some areas (e.g. parts of Gazelle Peninsula) indigence may be in such a stage of cultural transition that there may be no pervading custom on some matters.

(2) Genealogies

"..... Governments and Territorial Administrations should establish a land and genealogical registry system ". (2)

Genealogical registers are, admittedly, incomplete registers in that they only describe the statuses in a rightholding group on the basis of descent. The criteria of residence is not considered.

(1) The legal or customary code of reference by which the distribution, transfer and exercise of rights are conditioned.

(2) 19th Session of South Pacific Commission, Rabaul 1950.

(3) Transfers of Land Rights

Traditional forms of transfer such as social obligations and abandonment of land can be expected to continue. Economic contracts (purchase and lease) can be expected to increase.

Until land is systematically adjudicated the registration of transfers should be based on a deeds registration system.⁽¹⁾

Registers of (1) (2) and (3) would need to be kept at a local level by the Department of District Administration, the Land Titles Commission, the Local Government Councils, the Registrar of Titles or a Land Tenure Authority.

5. AN INDEPENDENT LAND TENURE AUTHORITY

The advantages of an independent Land Tenure Authority in promoting both sporadic and systematic adjudication would be:-

.1 The administration of adjudication could be efficiently and expeditiously carried out by properly appointed and trained staff.

(1) e.g. Gazelle Local Government Council Land Transfers Register Chapter 12, Part 1.

In its present form the Land Titles Commission cannot obtain adequate quantity or quality of staff. (Part 4.2 (ii)).

.2 Pre-hearing Inspectors, Counsels, and Demarcation Officers would be attached to the one agency. Consequently, co-ordination between agencies would be minimised.

Liason would be necessary with the Surveying Authority (See Chapter 17), the Judicial Commission and the Registry.

It is expected that the local offices of the Land Tenure Authority would be in close proximity to local Registries.

It may be advantageous for survey staff to be seconded from the Survey Authority to the Land Tenure Authority or the Registry. (1)

.3 The employment of adjudication staff through the Department of District Administration is unsatisfactory because this Department is preoccupied with its primary function of the development and extension of Local Government institutions and the advancement of general social and community development and welfare. (2)

(1) The success of title settlement in Jordan has been partly attributed to the fact that "the work of the land survey and title registration were carried out simultaneously by the same dept., while in other Middle Eastern countries the division of these functions between authorities has delayed the work". P26, Ref. 201.

(2) P.50, Ref. 168.

.4 The Land Titles Commission could operate as an independent judicial commission.

.5 The employment of adjudication staff through Local Government Councils is unsatisfactory because of :-

- (i) the need for centralised supervision and planning.
- (ii) Some Councils may not fully co-operate.
- (iii) Councils lack finance and sound administrative frameworks.

6. COST-BENEFIT RATIO OF SURVEY

Australian politicians and administrators have never been convinced of the need for large public expenditure on cadastral surveying (see Chapter 14). To meet the approval of Australian administrators in Papua and New Guinea the cost of survey must be minimal. The present chain and compass surveys have fulfilled this requirement.

Nevertheless, the ultimate benefit of these surveys is questionable. There is no guarantee that demarcation maps will be reliable. Marking is not controlled by statute. Surveys are such that when marks are lost, boundary relocations will be difficult.

7. FUTURE SURVEYS : DEMAND AND MANPOWER

The following analysis covers thirteen Districts. The surface areas of Adjudication Areas in the Madang and New Ireland Districts were not available.

.1 Assumptions:

(i) That the following model represents the pattern of the lodgment of claims (1):-

2. That all land is surveyed by chain and compass or similar terrestrial methods at a rate of 20 acres per man day. (Cf. Tables 4 & 5) (where a man day is one days work of a field party leader or superior).

3. That the number of working days in the year is 240.

(1) Based on experience at Rakunat, Matupit Island, and intuition.

.2 ANALYSIS

Year	Estimated area of land requiring survey (thousands of acres)	Estimated number of field party leaders and superiors.
1966	34,396	7,200
1967	19,136	3,970
1968	15,756	3,280
1969	14,266	2,970
1970	9,436	1,960
1971	7,476	1,560
1972	4,566	950
1973	4,543	945
1974	4,006	835
1975	4,006	836
	(1)	

These figures indicate, that if all claims were lodged within a reasonable extension of the gazetted time limit,⁽²⁾ the task of survey would be impossible in the light of manpower availability, finance, organisation and training.

(1) Derived from data supplied by the L.T.C.

(2) Even the doubling of the gazetted time limit in some areas is ambitious.

8. CONCLUSION

.1 The Native Land Commission Ordinance and the Land Titles Commission Ordinance adequately provided for the judicial operations necessary for the adjudication of traditional land rights.

Survey operations were ill-conceived in the Native Land Commission Ordinance.

The Land Titles Commission has not been able to take advantage of the flexibility, in the administrative and technical operations, permitted by the Land Titles Commission Ordinance, because of lack of qualified staff and finance.

.2 Commissioners have frequently been diverted from their primary task of presiding over hearings by administrative and technical matters.

.3 The systematic adjudication and demarcation of the whole Territory has been hindered by:-

(i) Inconsistency between top level policy and bureaucratic implementation.

(ii) Insufficient administrative assistance to Demarcation Committees.

(iii) Demarcation and survey has been sporadic within Adjudication Areas.

.4 Sporadic adjudication has been hindered by the lack of trained pre-hearing Inspectors and Counsels.

.5 The surveys executed by the Native Land Commission and the Land Titles Commission have been of such poor standard that their usefulness as cadastral data is very limited. Fault does not lie with the Native Land Commission or Land Titles Commission but with the Administration for inadequate overall planning of cadastral operations.

GENERAL REFERENCES

44, 149, 182

CHAPTER 8

THE SURVEY SITUATION

1. QUALIFIED CADASTRAL SURVEYORS - SUPPLY AND DEMAND

An inadequate supply of surveyors has plagued Papuan and New Guinean administrators since the very early years of colonial rule. Because survey was often carried out after land was made available, both the German Civil Code and the early Land Ordinances made provision for protection of the respective Administrations where the official survey resulted in changes of boundaries and/or area.⁽¹⁾

.1 HISTORICAL BACKGROUND

Annexation to World War I: Surveys associated with early commercial exploitation, missions and the establishment of colonial control.

World War I to World War II: (Commercial exploitation) Surveyors in demand for cadastral survey of expropriated properties and developmental work associated with economical exploitation.

(1) Sec. 9, Cl. 9 and 10; Sec. 4, Cl. 1 and 3, Ref. 225 and Sec. 11, Land Ordinance, 1912.

World War II to date : Surveys associated with:

- (i) the restoration of lost titles under the New Guinea Land Titles Restoration Ordinance.
- (ii) economic development and native welfare.

viz. land and timber rights purchases and land leases from natives;

leases of Administration/Crown land for land settlement schemes and urban development;

determination of land disputes between natives;

systematic demarcation and adjudication of all land;

land tenure conversion;

miscellaneous; Public Works, Posts and Telegraphs, Police, Education, Health.

.2 SITUATION SINCE WORLD WAR II

(Refer also Tables 13 and 14)

- (i) After World War II a few pre-war surveyors remained in the Territory. Recruitment was extremely difficult. At one stage the Department of Lands, Surveys and Mines had one surveyor. Those that were available were required predominantly for urban work (1).

(1) L.C. Debates. 2nd Council, 3rd Meeting,
1st Session 27th - 30th June, 1955.

(ii) By 1952, the Department of Lands, Surveys and Mines had three qualified surveyors.

(iii) By 1955, the Department of Lands, Surveys and Mines had seven surveyors.

" I am of the opinion that nothing has held up the development of this Territory more, with the exception of finance, then the lack of surveyors..... I maintain that with the increased tempo which has taken place over the short period of about 10 years, we are in a worse position with seven surveyors than we were immediately after the war"⁽¹⁾

(iv) October, 1957: the number of licensed surveyors employed by the Department of Lands, Surveys and Mines was not regarded as sufficient. The situation was not expected to change under the existing salary and other conditions.⁽²⁾

One licensed surveyor was in private practice in the Territory.⁽²⁾

The number of Granted Applications still awaiting survey was reaching serious proportions:-⁽²⁾

(1) P.43, Mr. Wittaker, L.C. Debates, 2nd Council, 3rd Meeting, 1st Session 27th -30th June, 1955.

(2) L.C. Debates 3rd Council, 1st Meeting, 1st Session 30th Sept. - 11th Oct. 1957 Vol. 4 No. 1.

<u>District</u>	<u>% of Granted Applications which had been surveyed.</u> (1)
Urban	almost all leases
Morobe	45
Madang	0
Eastern Highlands	6
Sepik	0
Western Highlands	1

(v) 1960: Table 8 indicates the situation.

An attempt was made to quieten increasing public criticism of title insecurity by an amendment to the Land Ordinances, whereby applicants for leases were no longer obliged to "pay fees for services which because of lack of survey staff and other circumstances are not likely to be rendered for some time to come". (2)

Increasingly in the 1960's use has been made of assistant surveyors (unqualified and inservice trained) to carry out field operations:-

(1) *ibid*

(2) Land (N.G.) Bill, 1960 and Land (P) Bill, 1960.
L.C. Debates. 3rd Council, 9th Meeting, 1st Session
23rd - 24th May, 1960. Vol. 4 No. 9.

"because of the expansion of survey work now being undertaken and because of the utilisation of more modern methods, it has become possible and desirable to have survey work carried out by groups each in the charge of an assistant surveyor, or other capable person, the work of all these groups being the responsibility of and being supervised by a licensed surveyor."(1)

"Because of the shortage of surveyors it has been necessary to use semi-trained personnel....."(2)

(vi) 1962 Fifteen licensed surveyors were practising in the Territory, of which four were in private practice. The Survey Ordinance was introduced because of "the increased emphasis on surveys and of the increased number of surveyors either Administration or Commonwealth employed or in private practice, carrying out title surveys in the Territory."(3)

(1) P.930. L.C. Debates, 5th Council, 9th Meeting, 1st Session 12th August - 24th Sept. 1963 Vol. 6, No.9

(2) Statement by Mr. Sharp to U.N. Visiting Mission - Discussion with Senior Administration Officers. Rabaul 14/4/62

(3) L.C. Debates, 5th Council 4th Meeting, 1st Session 5th - 9th March, 1962. Vol 6, No. 4.

In the early 1960's the Administration had taken priority recruitment action for survey staff.⁽¹⁾ By 1962, it was becoming increasingly concerned over its failure in recruitment and the rate of resignations.⁽²⁾ As an alternative since 1962, large vote allocations have been made available for contract surveys.

The introduction of the Real Property (Registration of Leases) Ordinance in 1962 (Chapter 5, Para.1.9, 2.9) indicates the gravity of the survey situation:-

"Honourable members know that, at the moment, the survey position in the Territory, like the survey position elsewhere, is bad and for that reason lease instruments have not been issued for a considerable proportion of the postwar grants..... In order to get over this difficulty and to allow registration even in the difficult circumstances of survey which exist at present it is proposed in this Bill to provide for a system whereby leases may be granted and registered subject to later survey"⁽³⁾

(1) Draft letter Asst. Director of D.L.S.M. to Secretary Dept. Territories. D.L.S.M.(Kone) L.T.(T.C. Ord.) File 63/1641

(2) Discussion between U.N. Visiting Mission with Senior Officers of the Administration. 14/4/62.

(3) Mr. Macinnis P. 349

L.C. Debates, 5th Council, 4th Meeting, 1st Session
5th-9th March, 1962.

(vii) 1964

The letting out of surveys under contract greatly relieved the pressure of work on the Division of Surveys. However, by the end of 1964, the bottleneck had been transferred to the Drafting Division. In December 1964, the Surveyor-General reported the following situation with respect to the examination of surveys:-

- (a) Konedobu Office : 90 surveys awaiting examination.
- (b) Mt. Hagen Office : 5 months delay between receipt of survey and completion of first examination.
- (c) Rabaul Office : some surveys lodged in early 1963 still not finalised.

This situation necessitated other unsatisfactory arrangements:-

(1) Contract surveyors were paid prior to the examination of their work. (The Administration was obliged to pay contractors within 12 months of lodgment of the survey plan.)

(2) The Surveyor - General considered that a contractor who was requisitioned more than 6 months after lodgment of plan could not be expected to return to the site of survey at his own expense.

(3) "Subject to survey" leases were being issued on lots already surveyed.

This bottleneck was considered to be due to:-

- (i) insufficient examining draftsmen.
- (ii) insistence on Australian examining standards. (1)

(viii) 1965

In the three years from 1962 to 1965 the recruitment program was curtailed in preference for:-

- (i) recruitment of staff for the Land Settlement Division in order that the Administration's land settlement target of 7,500 blocks in 5 years, could be reached. (2)
 - (ii) the letting out of survey work under contract.
-

(1) 2/12/64 S.G. to P.S. (N.G.I.)

D.L.S.M. (Rab.) file 10.1.1

(2) Draft letter. Assistant Director D.L.S.M. to Secretary Dept. Territories D.L.S.M. (Kone) Land Titles (Tenure Conversion) Ordinance file 63/1641.

After negotiations with the Minister for Territories, the retiring President of the Association of Surveyors of Papua and New Guinea reported, inter alia, in July, 1965 that the Administration considered:-

(a) there to be no urgent need to recruit surveyors or to expand the contract survey programme.

(b) that an increase in allowances to encourage the service of young surveyors was not contemplated.⁽¹⁾

.3 FUTURE MANPOWER SUPPLY AND DEMAND

The future manpower demand will depend on the type of survey system, the survey work organisation and the needs of the Land Titles Commission (Ch.7 Part 7). The following estimate in the Currie Report⁽²⁾ was obviously based primarily on the needs of the Department of Lands, Surveys and Mines and Public Works :-

Classification	Total in employed in 1963	No. needed in 1973	Incr.	Att. -rit -ion	Total Needed
Surveyors (predominantly expatriate)	44	68	24	55 (10%)	79
Asst. Surveyors (predominantly indigenous)	16	56	40	18 (5%)	58

(1) Bulletin of Association of Surveyors of Papua and New Guinea. No. 10 July 1965.

(2) pp 25-29. Ref. 223.

Table 6 indicates the estimated number of school leavers in the 1966-1969 period. From these meagre numbers indigenisation in all branches of the Public Service will be taking place at a much accelerated rate.

From the point of view of surveying, the following conclusions can be drawn:-

(i) Form 6 Leavers: There will be a very heavy demand for the few Form 6 graduates. Scholarships for study in Australian Universities will be available (e.g. for Veterinary Science, Law). It is unlikely that surveying can be made attractive enough to appeal to these people.

(ii) Form 4 Leavers: The School Certificate will be an entrance level for much tertiary education (e.g. I.H.T.E.: Univ. of P.N.G., Preliminary Year). Demand will be high but the rapid increase in output, indicated by the Table, may be able to meet demand. It can be assumed that a small number will embark on the Surveying diploma course at the Institute of Higher Technical Education. It cannot be expected that this number will satisfy surveyor demand.

(iii) Leavers from Form 3 and Form 2: These will be in demand for technician and trade courses respectively.⁽¹⁾ It is certain that recruitment of survey personnel at this level, provided Technical Courses are available, would be successful.

(1) pp. 83, 84, 85. Currie Report.

The Form 2 leavers from Technical and Junior Technical Schools should, in particular, be a fruitful source for survey recruitment.

(iv) Standard 6 and Form 1 Leavers: The Currie Report does not propose any formal education for Standard 6 and Form 1 leavers. Therefore recruitment may be easier but training by the employer will be necessary.

It is reasonable to expect a surplus in the school leavers labour market in the early 1970's⁽¹⁾ After this time, it may be possible to attract leavers of higher educational standard into the surveying profession.

(1) At this time the cumulative demand for professionals and sub-professionals by the Public Service will have been satisfied from available school leavers between 1964 and 1970-72. Refer Table 1 (a) of "Some Problems in Skilled Manpower". D. Chenowith. Conga Seminar Goroka 12-14/4/65.

2. INDIGENOUS ATTITUDES TO SURVEY OPERATIONS

.1 SURVEY MARKS

The Administration has had difficulty in ~~inculcating~~ a respect by natives for survey marks. This has applied particularly where the population pressure has been high and/or where alienated land is considerable, e.g. Gazelle Peninsula. (1)

In 1961, the Gazelle situation was so serious that the Department of Lands, Surveys and Mines tried to force respect for marks by court proceedings under the Survey Marks Ordinance. In the case of the Tunnel Hill Lease Final Order (under New Guinea Land Titles Restoration Ordinance), five endeavours over 5 years to mark the block had failed. (2)

.2 OFF-BOUNDARY TRAVERSES

Natives frequently misunderstand the purpose of off-boundary traverses. The cut traverse line is interpreted as the boundary and a dispute with the surveyor may result.

(1) Survey Marks Ordinance and Correspondence.

D.L.S.M. (Rab).file 10.3.2.

(2) Survey Marks Ordinance Prosecutions.

D.L.S.M. (Rab) file 10.3.6

.3 ATTITUDES TOWARDS LICENSED SURVEYORS

The public image of surveyors amongst the indigenous population is understandably poor. It is the surveyor who has had the task of redefining the boundaries of alienated land which is counter-claimed by natives. In such "contentious surveys" the native has regarded the surveyor as representing the "heavy hand" of the Administration.

3. SURVEY LAW AND REGULATIONS.

.1 SURVEY MARKS

Prior to the Survey Ordinance, 1962 (1) the only laws which related specifically to survey matters were the Survey Marks Ordinances:-

Territory of Papua : Survey Marks Ordinance, 1911

Territory of Papua and New Guinea : Survey Marks Ordinance, 1951 and

Survey Marks Ordinance (Amendment) 1957 No.69 of 1957.

Under the Ordinance of 1951, only marks placed in "official surveys" were protected.(Sec.3(1)). The general legal interpretation was that "official" referred only to departmental surveys. Consequently the Ordinance was quite limited in its application.

(1) The Survey Ordinance was drawn up in 1958 but not enacted until 1962.

The Survey Ordinance, 1962 extended protection to marks placed by licensed surveyors, departmental or private, (Sec. 29). Protection was not given to marks placed in surveys of initial purchases between natives and Administration/Crown, in Department of Forests purchase of rights surveys, and in Land Titles Commission surveys. (1)

.2 STATE CONTROL AND PROTECTION OF LICENSED SURVEYORS.

Prior to the Survey Ordinance of 1962, Surveyors were licensed under the Real Property Ordinance (Sec.131) and Land Registration Ordinance (Sec.198). Under the Survey Ordinance, the authority to license surveyors was transferred to the Surveyor-General.

The Survey Ordinance is the first statute in the Territory to give licensed surveyors, and their assistants, protection, when executing surveys.

(1) It is known by the L.T.C. that its' round cements have been removed at times - a case at Pila Pila Village, Gazelle Peninsula, on 4/3/65, was brought to the notice of the L.T.C. The Commissioner could not prosecute.

The disappointing feature of the Survey Ordinance is that it only deals with "authorised surveys". "Authorised surveys" are those executed by licensed surveyors. As licensed surveyors are almost exclusively engaged on surveys of alienated land, this Ordinance only deals with the cadastral surveys of approximately 3% of total land area.

.3 REGULATION OF "AUTHORISED SURVEYS".

Prior to 1958, confusion frequently occurred because surveyors and draftsmen worked to slightly different standards according to their country or State of training. The Administration accepted the work of a private surveyor subject to the checks of accuracy which were normally practised in Australia.⁽¹⁾

Survey Regulations for licensed surveyors, (refer Ch.16 for detail) have been in operation since 1958.

(1) pp.89-90 L.C. Debates. 3rd Council, 1st Meeting, 1st Session. 30th Sept. - 11th Oct. 1957
Vol. 4 No. 1.

.4 REGULATION OF SURVEYS EXECUTED BY UNQUALIFIED SURVEYORS

(i) Manuals

Several Instruction Manuals are available for unqualified surveyors:-

(a) "Elementary Surveying and Mapping" D.L.S.M. Oct. 1962.

This Manual was intended for adoption by all officers carrying out chain and compass surveys for land purchase and land settlement sub-division. The Manual is well prepared and, in general, adequately covers field and office procedures. Unsatisfactory features are:-

(1) Insufficient thought has been given to integrating chain and compass surveys into the cadastral system. The nearest physical feature such as a track junction is regarded as a satisfactory Datum. (Part 4) The view has apparently been held that surveys by licensed surveyors are the only "proper" cadastral surveys and that chain and compass surveys are only interim measures. This approach is unsound in the light of the number of chain and compass surveys at present awaiting "authorised" survey⁽¹⁾ and the

(1) Surveys of L.T.C., land purchase surveys in D.A.s U.A.L.s and N.L.D.s, Forestry timber rights surveys.

increasing number being performed. (1)

No matter what its accuracy, a survey can serve a useful cadastral function if:-

- (A) marking is adequate and properly regulated.
- (B) the survey is connected to other surveys so that it can be located on cadastral maps.
- (C) the survey is executed to enforced regulations.

(2) The requirements of the Manual have not been adequately enforced. Variations in practice are common especially amongst Department of District Administration officers. Examination of field books, plans and descriptions is inadequate and sometimes non-existent.

(3) The Manual has not been binding on Land Titles Commission surveys.

(b) "Forest Survey and Assessment Manual".

Dept .Forests 1966

Under this Manual there is more provision for the oversight of unauthorised surveys. Field book registration, plan drawing and legal descriptions are carried out at the Department of Forests, Head Office.

Connection to Department of Lands, Surveys and Mines surveys is made "where necessary".

(†) in particular; surveys for systematic demarcation and adjudication, L.S. schemes and tenure conversion schemes and timber rights surveys.

(c) "Booklet for Assistant Surveyors" D.L.S.M.
1962

This was prepared by Department of Lands, Surveys and Mines staff at the Rabaul Office, as a ready reference for assistant surveyors working under the supervision of licensed surveyors.

It gives details on the practical outworking of the Survey Regulations for licensed surveyors.

(ii) Supervision by Qualified Surveyors.

It is apparent from Chapters 6 and 7 that there has been little supervision by qualified surveyors of cadastral surveys performed by officers of the Department of District Administration, Department of Forests, Land Titles Commission and Department of Agriculture, Stock and Fisheries. This has resulted in considerable expenditure in time, manpower and finance for an almost worthless output.

Improved co-operation between these Departments and the Division of Surveys could have resulted in the many chain and compass surveys being of useful cadastral significance despite their low order of accuracy.

Examples of successful co-operation between Departments do, of course, exist. One such case was a survey to rationalise the settlement of the RANOULIF people in the Trans Vudal-Kerevat area of New Britain.

The survey was carried out by a Patrol Officer under supervision of the Department of Lands, Surveys and Mines. The Patrol Officer was instructed in field book procedures and types of marks.

4. THE ASSOCIATION OF SURVEYORS OF PAPUA AND NEW GUINEA.

.1 BACKGROUND

(1) The Association was formed in June 1960. A large percentage of the active membership in the early years was departmental surveyors.

(i) The constitution is based on that of the Queensland Institution of Surveyors.

(iii) Under the influence of the departmental surveyors the Association began with high ideals of maintaining Australian standards of professionalism in surveying in Papua and New Guinea. To this end, the Association has been vitally concerned about professional status:-

".... one of our objects must be to attempt to raise our professional status"(1)

"While this (the newly introduced Survey Ordinance of 1962) is a major help to our profession in the Territory, I feel that we have made very little headway in improving our status, both with the public and the Administration".(2)

(1) Editorial A.S.P.N.G. Bulletin No. 3 Oct. 1961.

(2) Address by Retiring President. A.S.P.N.G. Bulletin No. 8 Feb. 1964.

An Editorial of the Association's Bulletin recommended the formation of a Public Relations Subcommittee or a Public Relations Officer to publicise the importance and activities of survey in the Territory.⁽¹⁾

(iv) In keeping with its early aspirations of a professional surveying elite in the Territory, the Association approached the Institution of Surveyors, Australia, in 1962 regarding Divisional status. The Institution, in turn, invited the Association to join in late 1962. However, since about that date, modifications in attitudes towards professionalism have developed. Members have realised that the indigenisation of the profession could not be possible at the same level of training and professional standing as in Australia. Negotiations on Divisional status have now fallen through.

(v) Increasingly the Association has become concerned with the financial interests of its members. This has been brought about by:

(a) the increase in private surveyor membership and participation in the Association. In 1966, a contract Surveyor was President for the first time.

(1) A.S.P.N.G. Bulletin No. 7 July, 1963.

(b) the realisation on the part of departmental surveyors that their stay in Papua and New Guinea is only transitory and that (maximum) financial and seniority benefits must be accrued as rapidly as possible.

.2 THE ASSOCIATION AS AN AGENT IN PROMOTING Solutions to the Territory's Survey Problems.

The Association has played and will continue to play an important part as a forum for surveyors opinions.

It has contributed slowly, but very concretely, to the development of concepts for the training of indigenous surveyors, (Part 6). It has also successfully campaigned for the adoption of the metric system.

However in the light of (iv) and (v) above, it cannot be anticipated that the Association will necessarily campaign actively for a rapid solution to the Territory's most urgent survey problems (viz. manpower, appropriate standards, integration of surveys).

It has become apparent through discussion that the private surveyors tend to have a deeper concern for the Territory's future development and a more sensitive awareness of current economic, social and political trends, than do the departmental surveyors.

However, it can be anticipated that the interests of private surveyors may conflict with the rapid indigenisation of survey services. Until attitudes are modified, the Association may tend to be conservative with respect to the promotion of training for indigenes.

5. COST OF AUTHORISED SURVEYS.

Refer Table 15.

6. TRAINING AND EDUCATION OF INDIGENOUS SURVEYORS.

.1 THE TRAINING OF LICENSED SURVEYORS: THE DEVELOPMENT OF CONCEPTS.

1960-63

Licensed surveyors appeared to favour full professional training for indigenes:-

"Another object of the Association is to foster the interest of native people in our profession. A training course must be finalised and put forward shortly. Let us ensure that the full training of a Surveyor is appreciated and, consequently, used to the advancement of the country". (1)

"We owe the indigenous surveyors, when they appear, our support, advice and encouragement in their own professional association". (2)

1963- 64

There was a general agreement that although training should be at one level, the standards must be

(1) Editorial A.S.P.N.G. Bulletin No. 2 June 1961

(2) Editorial A.S.P.N.G. Bulletin No. 7 July, 1963

transitional. The Staff Surveyors' Conference in August 1963, agreed that the first step must be a technical diploma course with Intermediate Certificate entry. A university course should come later.⁽¹⁾

In June 1964, the Staff Surveyor's Conference agreed that an articulated pupillage system should be introduced and that the Royal Melbourne Institute of Technology correspondence course be used as a replacement for the Australian Board's of Surveyors Examinations.⁽²⁾ However, this was to be an interim measure as the creation of a Faculty of Surveying in the proposed University was considered imperative.⁽¹⁾

1964-65:

Surveyors began to realise that various standards of training may be necessary:-

In June 1965, the Staff Surveyors Conference recommended three intake levels, viz. Standard 9, School Certificate and Matriculation.⁽¹⁾

(1) Minutes of Staff Surveyors' Conferences.

D.L.S.M. (Kone) file 65/344.

(2) These examinations were terminated in Australian States when a University degree became a necessary prerequisite to registration with the various State Boards.

"We must:-

1. Train practical technicians.
2. Press for a Technical Diploma - to be Associates (of the Association of Surveyors)
3. Insist on a tertiary university level to be registered surveyors."⁽¹⁾

.2 TRAINING PROGRAMMES IN SURVEYING.

(i) 1966 Surveying Certificate Course-D.L.S.M.

(a) Background

Although the early introduction of a Survey Diploma Course at the Institute of Higher Technical Education was anticipated, the Department of Lands, Surveys and Mines realised the extreme urgency of training indigenous surveyors.

The Certificate Course began in Port Moresby with approximately twenty students.

Standard of entrance : 4th Form high school.

Duration of Course : 3 years + 1 year practical.

(1) Address by Retiring President A.S.P.N.G.

Bulletin No. 10, July, 1965.

The course had the following distinguishing features:-

(1) It was designed to produce a highly practical field surveyor (technologist) at a professional status level.

(2) It was designed to produce technologists who would think and work in terms of the existing cadastral surveying methods and regulations.

(b) The Course as a Contributor to Overcoming the Shortage of Surveyors.

The course was an attempt by a Government Department to overcome its own back-log of work. However, it was known that the Surveyor-General saw no reason why students from other Departments and private enterprise could not attend.

The Course was not designed to cope with the general surveyor shortage in the Territory. This is demonstrated by the fact that no attempt was made to train technicians in conjunction with the Course. The Course initiators hoped that "drop outs" from the Course would become technicians (assistant surveyors). The role of well trained technicians is most important if the cadastration of the whole Territory is to be achieved in a foreseeable time limit.

(ii) The Survey Diploma Course of the Institute of Higher Technical Education.

The Institute will take over the Survey Certificate Course in 1967.

If the Currie Report is implemented, this Course will produce a "well rounded" technologist, trained with a practical emphasis.

(iii) Training of Unqualified Surveyors.

(a) Department of District Administration:

Twice a year between 1961 and 1964, an experienced ex-Patrol Officer conducted a one week course for Cadet Patrol Officers on elementary surveying and mapping and land purchase procedures.

Several indigenous Assistant Field Officers were given survey training under the same instruction. Their educational standard was Intermediate or less. Their performance of work was observed at Sub-District Offices at Rabaul and Port Moresby. Chain and compass surveys were handled competently. Field routines were well developed and booking methods good. It is obvious that the routine training given has proved satisfactory and suitable.

The urgent engagement of expatriate Patrol Officers in field duties in recent years has necessitated a considerable reduction in the duration of briefing courses. Young Patrol Officers interviewed at Rabaul

stated that they had one month training at the Australian School of Pacific Administration and three weeks at Port Moresby. Of this only a very short time was devoted to land procedures and even less to surveying methods.

(b) Native Lands Commission and Land Titles Commission:

(1) Some Native Land Commissioners and Land Titles Commissioners have trained indigenes as Assistant Field Officers to execute chain and compass surveys.

Two Grade 7 men, trained by the Land Titles Commissioner of the Northern District, have proved quite satisfactory. Faults in their work are more the result of the inadequacy of their training program, than their inability.

(2) In early 1966, the Land Titles Commission began its first organised training program for indigenous surveyors. (Ch. 6, Para. 3.3).

The Course is of 3 months duration. It is not under the supervision of a qualified surveyor.

(c) Department of Forests:

(1) "Boss boys" are commonly used in chain and compass surveys for timber rights and land purchases and timber sampling. These men can read a compass

and chain and supervise a team of about six line cutters. All training is given in the course of field operations.

(2) A two year Certificate of Forestry Course is now operating. Minimum entrance standard is Form 2. 26.3% of total instruction time is given to surveying.⁽¹⁾

In 1965, some graduates of the course were being employed in surveys for timber rights and land purchases.

7. THE SURVEY PROBLEM

The Territory's survey problem can be summarised as the need for:-

1. Appropriately trained manpower to cope with future demand.

2. An appropriate governmental survey organisation to operate such that resources of finance and manpower are used to their optimum.

3. Appropriate standards of survey such that security of title is ensured but cost of survey minimised.

4. The integration of surveys at minimum cost and effort.

(1) Syllabus Certificate of Forestry. Dept. Forests
Bulolo

8. REMEDIES FOR THE SURVEY PROBLEM.

.1 REMEDIES TRIED

(i) Extensive use of Assistant Surveyors.

Disadvantages:

Assistant surveyors are not "block" trained and consequently have a poor background knowledge of their work.

In-the-field training is inadequate because it is sporadic, slow, demanding on all senior staff and unsystematic.

(ii) Registration of Land under the Land Registration Ordinance & Real Property Ordinance ... "subject to survey".

Disadvantages have been adequately dealt with in Chapters 5,6, and 7.

(iii) Extensive Use of Contract Surveyors.

Disadvantage:

Contract rates are so high that an Independent Papua and New Guinea could not afford. survey at this price.

(iv) Use of Unqualified Departmental Officers for Land Acquisition Surveys, Land Titles Commission Surveys, and Land Settlement Subdivisions.

Disadvantages have been made apparent in Chapters 6 and 7.

.2 REMEDIES NOT TRIED

(i) Indigenisation of Survey Services.

<u>Advantages</u>	<u>Disadvantages</u>
1. Preparation of the Public Service for Independence.	1. The nature of traditional New Guinean societies sets an excellent backdrop for corruption in the Public Service.
2. Survey operations, would be more economical.	Personal relationships are the basis of traditional society. They cannot be overthrown merely for the sake of some unrewarding equity of rights. ⁽¹⁾
3. Attrition rate of expatriate staff can be expected to rise as the country approaches self-government	
4. Indigenous surveyors are more likely to be respected by the native population than their expatriate counterparts.	

Because surveyors frequently have direct contact with rightholders, the relationship between Government and governed can be improved by the use of indigenous surveyors.

(1) pp. 45-46 Ref.125

Advantages

Disadvantages

2. Because of emotional ties with traditional society, the rate of resignation and irregular attendance will be high.
3. Indigenous employees have difficulty, at times, exerting authority over indigenes of different tribal backgrounds.
4. Because of an intial lack of a sense of responsibility toward the employer, it may be necessary for two technicians of different tribal groups to check each others work for a time.

(ii) Engagement of Staff at Various Levels of Training

The use of staff at various levels of training is inevitable in the light of the future supply of manpower.

The Currie Report suggests that, in fact, economic development requires a very small number of graduates and that it can proceed quite rapidly with a surprisingly high level of illiteracy. What is fatal is a shortage of intermediate personnel (technicians).⁽¹⁾ The Report further suggests that for every fully trained engineer, some 5 to 20 sub-professionals are needed. Similar numbers of lower technicians are needed for every sub-professional. The lower technicians each require tradesmen or craftsmen.⁽²⁾

(iii) Changes in the Organisation of Survey Operations.

Two corollaries follow from (ii):-

The first is that, in order to fully utilise manpower resources, field and office routines must be so systematised that personnel perform operations ~~commensurate~~ with their level of training.

Detailed planning with the aid of optimisation of technique calculations is essential.

The second is that, the field and office procedures of all technicians must be so stereotyped that observed and processed data can be readily

(1) p. 12. Ref. 223

(2) p. 16. ibid

integrated to produce the desired end product (e.g. map, subdivision); This does not mean that routines are unalterable. The success of cadastral survey operations in Papua and New Guinea depends on a high degree of flexibility.

Stereotyped routines must be regularly reviewed in the light of changes in technology, manpower availability, use to which survey is being put etc. To this end, a Research Division is a necessity.

The case for the use of stereotyped routines is not only organisational. A psychological justification can be made out also:-

The majority of indigenes still undergo childhood socialisation in the context of traditional culture. Although this culture is at various stages of transition in various parts of the country, the child is still familiarised with the importance of ritual in everyday life (cases of serious cultural disintegration excepted). In the traditional Melanesian culture, ritual is the causal link in the chain of human affairs.⁽¹⁾ In the thought patterns which result "ritualistic type practices" are regarded as means to ends.

It is most probable that at least those technicians with a village background and low standard of education

(1) Refer (1) next page.

will give stereotyped routines a "ritualistic" interpretation. They will regard them as essential to the success of the whole survey. It is important that where such thought patterns exist, they be used to advantage in the training programme.

(iv) Changes in Standards of Survey.

The specification of standards for cadastral surveys primarily deals with:

- (a) the monumentation,
- (b) the accuracy of the survey itself.

The World Bank Mission Report adopted as one of its three guiding principles:-

"The Standards of Administration Services and facilities should be related to Territory conditions, if the maximum numbers of people are to benefit from the money spent on the program".⁽²⁾

It is shown in Chapter 16 that, except for minor changes, Australian standards of survey have been adopted for "authorised surveys" in the Territory.

(1) Ed. Lawrence, P and Meggit, M.J. "Gods, Ghosts and Men in Melanesia: Some Religions of Australian New Guinea and New Hebrides". O.U.P. 1965

(2) p. 36, Ref. 221

On the other hand, Chapters 6 and 7 indicate inadequate standards of survey for "unauthorised surveys".

Appropriate standards of monumentation and accuracy must be sought for all types of land in Papua and New Guinea.

It is important to stress that standards should differ according to the use of the survey and the value and use of the land (Ref. Ch. 2)

It is not necessary and certainly not economic to survey all lands in a country to the one standard.

GENERAL REFERENCES

33, 67, 68

SECTION 3

THE CADASTERATION OF

THE TERRITORY -

A BROAD APPROACH.

CHAPTER 9

THE TRANSPLANTATION OF TECHNOLOGICAL AND ADMINISTRATIVE CONCEPTS AND PRACTICES.

1. TECHNOLOGY, PUBLIC ADMINISTRATION AND CULTURE

The isolation of technology or public administration as an aspect of a culture for study is only permissible if the systematic and integrated nature of culture is not discarded. Culture is a whole. The technology or public administration of a culture is inextricably linked with all other aspects of the culture. It is systematised or patterned to the values and needs of the culture.

Meaning and interpretation is given to technical and administrative practices by the value systems of the culture. Consequently, technical and administrative practices may acquire "cultural accretions" which may not be necessary, but are nevertheless considered essential to the success of the process.

The fact that technology and management practices in the modern industrialised society are based on scientific knowledge, research and objectivity does not prevent them from being influenced by the ambient mores.

2. CAUSES OF "CULTURAL ACCRETIONS"

A basic technical or administrative practice acquires diversification of meaning and technique in different cultures due to:-

- .1 Physical environment - natural resources available.
- .2 The historical development (evolution) of the practice.
- .3 The amount and type of scientific and/or common sense knowledge.
- .4 The meaning and sanctions given to the practice by values and mores of the culture.
- .5 The acquired needs developed by the society.

3. THE TRANSPLANTATION OF TECHNICAL AND ADMINISTRATIVE CONCEPTS AND PRACTICES.

Once invented, technical and administrative processes can be used effectively within other cultures. Two requirements must, however, be fulfilled.

- .1 THE PROCESS MUST BE DEVOIDED OF "CULTURAL ACCRETIONS" ACQUIRED IN THE PARENT CULTURE. Only the core, that which is scientifically essential, must be transplanted. If the process is not disassociated from the old "cultural accretions", it will be difficult to adapt it to the new cultural environment.

.2 NEW "CULTURAL ACCRETIONS" MUST BE GRAFTED TO THE FOREIGN PROCESS. The introduced process must be reinterpreted in terms of the new cultural environment. The foreign process can be adapted with minimum disruption provided that:-

- (i) A scientific study of the culture is made or is already available.
- (ii) experimental pilot projects are used.
- (iii) full participation of the members of the society is sought.

4. CADASTRATION AS CULTURAL CHANGE

Cadastration is an innovation which affects day-to-day village life. It contributes to the disintegration of the traditional village social unit in the following ways:-

- .1 It transfers the system of land administration from the native community to the Administration.
- .2 In so doing, it dissolves the "public memory" system of land registration.
- .3 It eradicates ownership and boundary disputes.
- .4 It facilitates economic development on suitable village lands.

Dowson and Sheppard suggest that "it is accordingly of highest importance that land surveyors who are called upon to deal with cadastral problems of any territory

shall bring to their solution knowledge of the social structure, agricultural practices and land tenures, customary as well as statutory, of the community concerned". (1)

As Australia is responsible for the introduction of change in Papua and New Guinea, it is important to clarify what are the Australian cadastral concepts and practices and where do these need to be stripped of "cultural accretions" before transplantation.

It is also important to analyse present New Guinean cadastral concepts and practices to determine those Australian innovations which have been introduced without sufficient adaptation.

By pursuing this analytical approach in the ensuing Chapters, the most satisfactory concepts and practices for the future become apparent.

The methodology used in the following chapters is explained in Appendix 8.

GENERAL REFERENCES

141

(1) P1. Ref.57

CHAPTER 10

AUSTRALIAN LAND REGISTRATION CONCEPTS AND PRACTICES

1. RECORDING AND CONVEYANCING SYSTEMS

.1 TYPES OF SYSTEMS

The registration and conveyancing systems in most States are:-

- (i) Registration of Deeds. Deeds relating to any form of tenure may be registered.
- (ii) Registration of Title. Not all rights are registrable. Normal conveyancing practice (Deeds Registration) applies to all equitable interests.⁽¹⁾
- (iii) Registration of Rights under the Crown⁽²⁾ In the cases of licenses, leases, perpetual leases, conditional purchases, etc., where no freehold grant is issued, registration and conveyancing is carried out in various Government agencies⁽³⁾.

- (1) *Tietyens v Cox* (1916) 17 S.R.48, 34W.N. 10 per Harvey, J.
- (2) e.g. in N.S.W. : Crown Lands Acts, Closer Settlement Acts, Western Lands Act.
- (3) e.g. in N.S.W. Department of Lands, Water Conservation and Irrigation Commission, Western Lands Commission.

The legal status of these registers is vague.

(iv) Registration of Rights under the Mining Acts.

Leases and authorities to mine are administered by the Department of Mines.

.2 COMMENTS

These systems have evolved as a result of the pattern of land settlement and administrative and political mismanagement. Disadvantages of the present situation are:-

- (i) The confusion and overlap between .1(i) and .1(ii) Even with the compulsory conversion of all land onto the Torrens Register,⁽¹⁾ it will still be necessary for equitable interests and some other rights to be registered under the Deeds Registration System.
- (ii) The inconvenience of searching or conveying rights and titles at different agencies with different standards of procedure and different systems of registration.

(1) Ref. 142.

2. AUSTRALIAN TORRENS ACTS AS SUBSTANTIVE LAW

The substantive content is incorporated by:-

- (i) express modifications to previous land law
- (ii) the definition of what are "legal", and hence registrable, rights.

.1 SEISIN - PRESCRIPTION AND LIMITATION

The recognition of title by possession has always been contentious and various States have differing opinions. Generally, "ownership", "seisin" and "registration" have not been completely merged. Tasmania, Victoria, Western Australia and South Australia (in a limited way) recognise title by adverse possession. Queensland law is silent. In New South Wales, Section 45 of the Real Property Act, which expressly forbids the Limitation Acts, has been judicially described as "one of the great flaws in the system".⁽¹⁾

There need be no incompatibility between the guaranteed title (registration) and the acquisition of title by adverse possession (equity). The question is a matter of which evidence is superior in a particular case. Registration of Title is a system of insurance of title to land. The State must bear responsibility for titles found inadequate due to possessory claims.

(1) Per Harvey J. in *Turner v Myerson* (1917) 18(N.S.W.) S.R.133.

.2 ABSOLUTE AND RELATIVE OWNERSHIP

There is no allodial land in Australia. The principles of feudal tenure have been transplanted from England.

The Doctrine of Estates and its corollary, the Doctrine of Tenures, were inextricably linked under feudal law. They amply fulfilled the requirements of medieval social organisation. However, the new methods of limiting land admitted by common, statute and equity law since the Renaissance and Reformation have caused dramatic modifications to feudal concepts. Australian Torrens Acts now perpetuate these feudal concepts only in theory. The Torrens Acts are the "nearest approach yet made in form to allodial ownership under purely English law. Were feudal tenure technically, as it has been practically, replaced by allodial ownership, the Torrens System of conveyance of registration would require but little alteration to transform it into a consistent system, logically resting on intelligible principles".⁽¹⁾

(1) Ref. 92

Not only are the feudal concepts inconsistent with the practical outworking of modern Australian land law, they complicate lay understanding of land law. The Doctrine of Estates detaches rights in land from land itself and then attaches them to an imaginary "thing" called an "estate". The fictitious nature of the "thingness" of an estate is unnecessarily confusing. In addition, those rights in land which are not classified as "real" fall under the law of contract and personal property.

.3 MORTGAGES

At variance with common law, an estate in the land is not transferred to the mortgagee. Rather, the mortgage is a statutory legal charge on the land. It follows that the "foreclosure" action known to equity law does not apply as there is no transfer of the legal estate. This has been remedied by the substitution of a statutory process of foreclosure by which the mortgagor can be deprived of his right to ever redeem the mortgaged land.

.4 REGISTRABLE AND NON-REGISTRABLE RIGHTS

The Torrens Acts are "incomplete" systems of Land Registration. They do not purport to provide complete registers of rights. Rather, they only register

those rights which are by law the subject of the land and not the owner, e.g., easements, mortgages, leases over 3 years.

What are equitable interests in land under general law are usually non-registrable rights under statutory (Torrens Acts) law. Exceptions are

- (i) a right of, or covenant to, purchase contained in a lease .
- (ii) a restrictive covenant.

Non-registrable rights are conveyed under a registration of deeds system.

Registrable rights are classified as "corporeal" or "incorporeal" hereditaments.

(i) Corporeal Hereditaments

The right of ownership is registered as an estate in fee. This estate in fee is the basic right to which other rights are related. In Australia, the estate in fee simple is the most common estate in fee.

(ii) Incorporeal Hereditaments

The legal distinction between incorporeal hereditaments and other rights which don't involve physical possession is perpetuated in Australian Torrens Acts. The rigidity of English common law has restricted the number of incorporeal hereditaments to

those recognised as such by medieval lawyers.⁽¹⁾

These hereditaments are the subject of the land and not a person. They are binding upon subsequent owners, therefore they must be registered against the land with the corporeal estates.

The two main classes of incorporeal hereditaments perpetuated in Australia are:-

- (a) Future estates in fee:- Reversions and Remainders.
- (b) Estates without possession:- Easements and Profits.
- (iii) Non-registrable Rights.

The purchaser of Torrens title land is protected from unregistered interests even in the case of his foreknowledge. Ballman regards this as one of the five virtues of the Torrens System.⁽²⁾

Although trusts and equitable interests are not required to be noted they are not prohibited from creation by the Acts.

- (1) There are exceptions: Western Australian and Victorian Legislation permit the existence of easements without registration. Ref.162.
- (2) Ref. 18.

Furthermore, they may be protected by lodgment of a caveat.⁽¹⁾ However, the caveat system only affords temporary or perhaps ephemeral protection. When a caveat has lapsed it cannot be renewed. Despite endorsement by memorandum on the Certificate of Title, the non-registrable right remains subject to equitable or common law doctrine, i.e., endorsement does not change the legal status of the right.

The non-notation of trusts is not an essential feature of a land registration system. Its success depends primarily upon the system of land tenure. It is suitable to a system based on the pre-eminence of individual title.⁽²⁾ In the case of communally owned land, it may be advantageous to nominate trustees as legal owners. The maintenance of an up-to-date record of all community members as registered proprietors on a Certificate of Title becomes unnecessarily complex. Simplicity must give way to rigid adherence to the Curtain Principle.

- (1) Alternatively, a trust may be protected by the endorsement on the Register of the words "no-survivorship" or "upon conditions".
- (2) Non-notation of trusts has been successful in Australia, U.S.A. and Canada.

The Torrens Acts have perpetuated one of the most confusing features of English jurisprudence - the distinction between law and equity.⁽¹⁾

.5 CO-OWNERSHIP

The two separate types of co-ownership (joint tenancy and tenancy in common) known in English land law are provided for in the Australian Torrens Acts.

.6 LEASEHOLD INTERESTS

The hiring (lease) of land, like the securing of land (mortgage) is a right created out of a proprietary right. The law of leaseholds is basically a non-feudal law. In Australian land law it has been superimposed upon feudal concepts (Doctrines of Estates and Tenures). As the lessee's "term of years" title cannot be recovered by "real action" it is still classed in theory as personal property.

3. AUSTRALIAN TORRENS ACTS AS MACHINERY MEASURES

The machinery measures of the Australian Torrens Acts are designed to achieve two goals:-

- (1) The promotion of a simple, efficient public record of title to land.
 - (2) The guarantee of the contents of the record.
-
- (1) Admittedly, equitable interests in corporeal and incorporeal hereditaments have been done away with by Torrens legislation.

The basic management concepts applied to achieve these goals have been described by Ruoff,⁽¹⁾ as the Mirror and Curtain Principles in the case of (1) and the Insurance Principle in the case of (2).⁽²⁾ Although other principles are discussed below, they are subservient to these three underlying "Torrens" principles.

Helmore⁽³⁾ has justifiable misgivings about the use of the metaphors "mirror" and "curtain". However, for the purpose of this discussion they will serve well as a basis for analysis.

.1 MIRROR PRINCIPLE (See Glossary for Definition)

This principle is implemented by the declaration of the current title on one document (the Certificate of Title.)

(i) Unambiguous Definition of Parcels, Persons and Rights.

A principal cause of ambiguity in many countries is the inadequacy of parcel definition. The isolated system of surveys in Australia is a typical example. (Chapter 14).

(1) Ref. 171.

(2) See Glossary for definitions.

(3) Ref. 89.

The use of one legal document (Certificate of Title) for each parcel upon which all registrable rights and rightholders are currently noted, leads to a high degree of unambiguity. The rigorous examination of title by registry staff at initial registration has also contributed considerably.

The Australian Register Books are built up by binding the Certificates of Title together. This format is suitable for land tenure systems where a proprietary right is the predominant right in each case. Where this is not the case, the format will differ in that many equally important rights will be registered against the land and a certificate of right will be an extract of part of a folio only.

In some countries, the issue of a certificate of right or title (either by extract or folium copy) is not practised at all. The land register is the only source of information.⁽¹⁾

(ii) Maintenance of the Record.

The second requirement for the fulfillment of the mirror principle is the safe-keeping of facts up-to-date.

(1) e.g. Switzerland, Egypt, Sarawak, Germany, Austria, Hungary, Tunisia, Native lands of Malaysia.

Sir R. Torrens' motive in introducing the South Australian Real Property Act was simplification of conveyancing. This was achieved primarily by the use of prescribed forms and the Certificate of Title and memorial systems. Upon this basis, the administrative methods remained unaltered for approximately 100 years. During this time, commentators on land registration were occupied with the legal aspects of the system, such as indefeasibility, caveatable interests, adverse possession, registration of causes and writs.

In the late 1950's for the first time, the management aspects of land registration came under scrutiny. It was seen that the Register Book, Certificate of Title and methods of recording mutations are not the essential ingredients of the Torrens System and that the recording system is only a means to an end.⁽¹⁾ That end is the community's need for facilitated dealings with land. As a result of this reappraisal, Stage I of reform in New South Wales was legislated⁽²⁾ in 1961. Stage 2 legislation is in preparation.

(1) Ref. 51

(2) Conveyancing Act Regs. 1961, Part 4. G.G. No.3 of 1961.

(a) Mutations

Torrens explained that one of the three main principles of his measure was:-

"as often as the fee simple was transferred the title must be surrendered and a fresh grant issued".⁽¹⁾

This has resulted in:-

- (1) the creation of a chain of Certificates of Title commencing with the original grant. A search for current title, where no short cuts were available by means of charting maps, would be almost as tedious as a search of a title in the deeds register.
- (2) a heavy drain on registry personnel in drawing up new Certificates of Title for the same parcel

Since January, 1961, New South Wales has provided for wider use of maps and plans as the key to the register. All plans, irrespective of number of lots therein contained, or the system of title registration are now catalogued as Deposited Plans from the moment of lodgment. They are used as charting maps upon which all new Certificates of Title must be noted. Thus the current Certificate of Title can be obtained directly from up-to-date charting maps.

(1) Ref.69.

The drain on manpower has been minimised by:-

- (1) The registration of as many dealings as possible "by endorsement", that is, no preparation of a new Certificate of Title in cases where the parcel is not mutated.
- (2) The mass production of Certificates of Title by the use of a Xerox-multilith machine.
- (3) Prior to 1961, unless requested, the partially cancelled Certificate of Title continued, after subdivision, as the current reference for the residue. In the case of large subdivisions, the use of partially cancelled Certificates of Title was cumbersome.⁽¹⁾ Partial Certificates of Title have been done away with. Upon subdivision, new Certificates of Title are issued for all parcels.

(b) Purging of Dead Matter

It is obvious that dead Certificates of Title must be retained as evidence. Stage 2 of reform in New South Wales includes provision for the systematic withdrawing of "dead" records by conversion of the register to a loose-leaf filing system. Electronic memory storage will possibly replace the Register Book.

- (1) Ref. 51.

(c) Protection of Records

Stage 2 of New South Wales reform provides for modern microfilming methods as an economic solution.

.2 CURTAIN PRINCIPLE

This principle was not included in the original South Australian Act. It appeared in one of the early amendments. Its full implementation has been restricted by the growth of legislative policy enabling Government authorities to impose restrictions and prohibitions over land by notification in the Gazette and newspapers.

In New South Wales such statutory obligations are generally registered in the Register of Causes, Writs and Orders.⁽¹⁾ However, this has generally been unsatisfactory and a Committee was appointed in 1955 to investigate alternatives.⁽²⁾

The findings of this Committee were that all proclamations, notifications, orders, determinations and resolutions by public authorities affecting land should be registered in the Torrens Register Book or the General Register of Deeds.

(1) Sec.185-194, Conveyancing Act.

(2) Ref. 229.

.3 INSURANCE PRINCIPLE

An extrapolation of this principle reads:
"The whole business of registration ought to be conducted with such economy of public manpower, public time and public money that the saving which is achieved far outweighs any payment of compensation for errors or omissions which may become necessary from time to time".⁽¹⁾

In this light, the insurance principle is rather an "economy principle" which is based on principles of modern management.

(i) Legal Effect and Guarantee of Registration

The Torrens System is a positive system of land registration. The Certificate of Title is received in all courts of law and equity as conclusive evidence and is financially guaranteed by means of the Assurance Fund. However, it is not truly indefeasible in that:-

- (a) amendments to the Certificate of Title are permissible.
- (b) superior evidence acceptable to a court may include adverse possession (Para.2.1),

(1) P.34 Ref.171

registration of instruments which are invalid under a Court decision,⁽¹⁾ registration of instruments which contravene a statutory provision.⁽²⁾

An assurance fund is not an essential feature of a land registration system. In several continental countries,⁽³⁾ confidence in the land books is so high that the state has no need to guarantee the records. If a person suffers loss, the state is sued directly.

Experience in all Australian jurisdictions is that the Assurance Fund has very infrequently been drawn upon. This state of affairs has been considered by some commentators to be the result of the limited conditions under which compensation may be claimed. J. Ballman has rebuked the New South Wales situation as a state of "indecent solvency".⁽⁴⁾ T. Ruoff⁽⁵⁾ has remarked unfavourably towards Section 126 of the New South Wales Real Property Act. This requires

- (1) Harris v McGregor(1912) 32 N.Z.L.R. 15
Mereona Perepe v Anderson(1936) N.Z.L.R.47
- (2) Pearson v The Aotca District Maori Land Board
(1045) G.L.R. 205
- (3) e.g. Switzerland, Germany, Austria, Hungary.
- (4) Ballman, J. "The Torrens System in N.S.W."
Aust. Law Book Co. P56.
- (5) P.75 Ref. 171

the registered owner, who has suffered loss through deprivation of his land, to pursue a fruitless remedy against the person who has deprived him prior to claiming against the Fund. Ruoff observes that in England and Wales a claim for rectification of the register and one for indemnity due to loss are complementary remedies.

The Australian requirement of court action against the Registrar as nominal defendant and guardian of the Assurance Fund is not essential, and involves unreasonable legal costs for the claimant. A reasonable claim against the Fund could be handled, directly by the Registrar as in the case of claims for rectification.

(ii) Limited or Presumptive Title

Compulsory registration in South Australia was introduced in 1945.⁽¹⁾ This has necessitated provision for "limited" titles when the Registrar is not satisfied with the definition of the subject land or the proof of title.

(1) R.P.(Registrating Titles) Act 1945.

Victoria adopted compulsory registration in the Transfer of Land Act, December, 1954.

.4 INITIAL REGISTRATION

(1) Method of Initial Registration

Since the introduction of the Torrens Acts all Crown grants have been compulsorily registered in the Register Book. However, until 1945, free-land hold/was brought under the Acts sporadically and voluntarily.

The disadvantages of a sporadic voluntary system are:-

- (a) Completion of the register is left to an uncertain time in the future.
- (b) Inefficiency, due to duplication of work in both title investigation and survey.

(ii) Validity of Initial Title

The Registrar-General Departments have made extensive investigations of title and parcels prior to bringing any parcel under the Act. In many cases the expenditure involved in investigation has not been warranted, when considered on the basis of probable risk. Less rigorous initial examination would have been possible if the Assurance Fund had been made more flexible to cover cases of error in the Mirror due to incomplete investigation.

On the other hand, confidence in the whole registration system is dependent upon the reliability of the initial title. The curtain principle must be a reality and not just legal theory. Compensation by means of monetary indemnity can never be fully equated with loss of landed property.

A balanced approach to initial title investigation is difficult. It is considered that Australian practice has tended to be too conservative.

.5 TRANSACTIONS

(i) Sale and Purchase

(a) Use of Preliminary Contracts of Sale.

One of Sir R. Torrens three main principles was "that by the use of stereotyped forms, any man of ordinary sense and education may transact his own business without employing a solicitor except in complicated cases"⁽¹⁾ This has not generally been found expedient in the modern market economy. In Australia, a preliminary contract of sale is generally used.

(1) "Speeches of R.R. Torrens explanatory of his measure for the Reform of the Law of Real Property."

In contradistinction, where dealings are transacted between members of a small community or small neighbouring communities, direct use of statutory instruments of transfer is common, examples are the Mukim Register of Malaya, Egypt, Palestine, Sarawak. (1)

(b) Requisitions by Purchaser to Vendor

Requisitions on title cannot be made as the Certificate of Title is clear cut. However, as no sure statement of boundaries exists, requisitions may arise out of an identification survey.

An identification survey is the only means in Australian practice to uncover:-

- (1) misdescriptions of the subject parcel in the contract,
- (2) any defect between the vendor's legal title and what is on the ground. This particularly applies to easements, encroachments and non-registrable rights.

A survey system can be so designed as to eliminate the necessity for identification surveys (Chapter 17) in the majority of cases.

(1) p.128 Ref.57

(c) Identification of Vendor

In all Australian Acts it is incumbent on the purchaser to satisfy himself of the identity of the vendor.

This is not essential, and in many developing and continental countries, ⁽¹⁾ the Registrar must identify contracting parties to his satisfaction.

(ii) Professional Assistance in Transactions

The Australian economy has always been able to afford a highly specialised professional fraternity to handle legal matters. The Torrens System has been designed to obviate the assistance of lawyers in common dealings. However, due to the nature of work specialisation in the Australian work organisation, lawyers are widely employed.

The use of a qualified lawyer for normal Torrens conveyancing is unnecessary and expensive. As fully qualified lawyers are scarce in developing countries, their work as conveyancers must be minimised. Two solutions are available:-

(1) e.g. Malaysia, Egypt, Switzerland, Germany
Austria.

- (a) Provision for licensed notaries or land brokers who are qualified to execute dealings in land.
- (b) Provision for verbal conveyancing before the Registrar.

Both these methods are advantageous in developing countries. (b) is only possible if the registry service is decentralised. Examples of verbal conveyancing occur in Germany, Malaysia, Egypt.⁽¹⁾

(iii) Use of Standard Forms

Sir. R. Torrens introduced standard forms in order to promote simplicity. However, the rigidity of standard forms and the memorial system have come into some criticism in recent years. Ruoff suggests that simplicity may be gained at the loss of flexibility.⁽²⁾ Flexibility in forms is permitted to some degree.⁽³⁾ But it has been suggested⁽⁴⁾ that the registered proprietor should have wider dispositionary powers.

(1) P.146 Ref. 57 (4) P.12 Ref.171

(2) P.59 Ref. 171

(3) e.g. Sec. 103 and 104 N.S.W. Real Property Act, where express power is given to alter or modify forms except in matters of substance.

Both flexibility and simplicity have intrinsic worth in a land registration system. The more complex the system of land tenure, the greater will be the need for flexibility, especially in the nature and form of transactions.

.6 THE POWERS OF THE REGISTRAR

(i) Quasi-judicial Powers.

The Australian Torrens System has been considered as much a part of the judicial system as the administrative system. Therefore major judicial decisions in the Acts are in the hands of the judiciary. The Registrar has only minor judicial powers. An example already quoted is the case of claims for indemnity.

In a developing country, the courts are usually overloaded. More judicial power could be passed onto the Registrar.

(ii) Administrative Powers

Administrative powers are rigidly defined in the Australian Acts. In contradistinction the Registrar, under the English Acts⁽¹⁾ has wide discretionary power and is free to relax any

(1) Land Regulation Rules 1925 England R.322.

regulation for any purpose.

If the land registry is to be run as a business enterprise, the administrators must be given flexibility in management.

(iii) The Community's Needs.

An area where Australian Registrars are not given sufficient powers is in the modification of the land registration system to the changing needs of the community. The difficulties surrounding the introduction of Strata Titles is an example. Had the New South Wales Real Property Act and Conveyancing Act been flexible in administrative matters, there probably would have been no need for the Conveyancing (Strata Titles) Act, 1961.

In a developing country serious delays in the introduction of new legislation can occur. The Registrar should have wide powers to modify the registry practice to suit local needs, even prior to legislative moves in that direction.

.7 REGISTRY SERVICE

(i) Centralised Administration and Service

The pattern of land settlement in Australia in the first 100 years tended to cause administration to be located in the few large urban concentrations.

However, in the past 80 years, Crown Land administration has tended toward decentralisation⁽¹⁾, due to the creation of Land Board Districts.

The administration of the Registrar-Generals' Departments has remained centralised. Title and plan registration operates solely from the capitals in New South Wales, Victoria, South Australia, Western Australia and Tasmania. Under the Queensland Real Property(Local Registries) Act, 1887, local registries were established at Rockhampton and Townsville.

The degree of decentralisation is dependent upon the pattern of land use and the social and economic needs arising out of that land use. It would also appear that in countries where there is a high degree of illiteracy or peasant agriculture, there are advantages in decentralising administration and service.

Industrialised countries appear to prefer a centralised service (exceptions are New Zealand, Canada and Ireland), whereas most developing countries appear to prefer decentralisation, for example, Egypt, Palestine, Cyprus, Malaysia, Kenya. Also, due to the peasant nature of agriculture, many continental countries have long established local registries, for example Switzerland, Germany, Austria, Hungary.

- (1) The Crown Lands Act, 1884 and Crown Lands Amendment Act, 1889, were the first steps toward decentralisation in New South Wales.

(ii) Availability of Records for Searching

The more viable the economy, the greater the demand by registry staff and public for information from records. Apart from Victoria, the Australian pattern has until recently been to bind Certificates of Title in Volumes of fifty. The search of one Certificate of Title, consequently, puts the remaining forty-nine out of use.

GENERAL REFERENCES

12, 16, 17, 18, 51, 69, 70, 78, 89, 92, 105, 106
114, 142, 162, 171, 189, 229.

CHAPTER II

WORKING FEATURES OF A LAND REGISTRATION SYSTEM

The essential features are:-

- (i) The unambiguous definition of parcels, rights and rightholders.
- (ii) Registration is a dispositive act and fact with regard to title.
- (iii) The maintenance of up-to-date records.
- (iv) The control of registration by the Central Government.
- (v) The continuous adaptation of the registration system to the community's needs.

The following features are advantageous, and should be transplanted in a developing country:-

- (a) Completeness of record. This necessitates compulsory and systematic initial registration.
- (b) The administration of all aspects of the Registry as a land titles insurance undertaking and business venture.
- (c) Maximum flexibility in Registry administration, provided simplicity of procedures is maintained.
- (d) Complementary remedies of rectification to the Register or indemnity by the State in the case of an invalid or erroneous title.

- (e) A loose-leaf Register.
- (f) Regular purging of obsolete matter from the Register.
- (g) Protective duplication of all records.
- (h) The identification of parties by a Registry official prior to the registration of dealings.
- (i) The issue to a rightholder of some certification of his land rights.
- (j) The decentralisation of registry services where rural life is parochial or the people are semiliterate.
- (k) The use of notaries and verbal conveyancing amongst parochial or semiliterate people.

GENERAL REFERENCES

CHAPTER 12

NEW GUINEAN LAND REGISTRATION CONCEPTS AND PRACTICES

1. RECORDING AND CONVEYANCING SYSTEMS

.1 TYPES OF SYSTEMS.

The systems of recording and/or conveying land rights can be classified under:-

- (i) Registration of Title.
- (ii) Registration of Miscellaneous Rights over Crown/Administration Land.

Although the New Guinea Torrens Acts (R.P.O. and L.R.O.) have been broadened to include the registration of leaseholds over Crown/Administration land, minor rights such as licenses have not been provided for. It is the responsibility of Government Agencies to keep and maintain the records of these minor rights (Refer. Ch. 6, Para. 4.)

- (iii) Registration of Transfers from Natives to Crown/Administration.

The Deed of Attestation and Unregistered Administration Land Registers (Ch. 5, Para 2.1(i)) are based on the normal system of deeds registration. The Deeds of Transfer are numbered consecutively according to date of entry in the Registers.

Dealings

The Native Land Register does not follow this system. Deeds are not entered according to date of entry or date of transaction. As the Native Land Dealings Register is unofficial, it appears that little consideration has been given to the priority of instruments.

(iv) Registration of Native Customary Rights.

Occasionally officers of the Department of District Administration have informally recorded in departmental files the witnessing of a transfer or the determination of a dispute. (1)

Rights determined by the Native Land Commission and the Land Titles Commission have not been recorded, per se, on the basis of any recognised rights recording system, except for the Land Titles Commission's registration of genealogies. (Ch. 7, Para. 1.1, 1.2, 2.1, 2.2).

The registration under the Land Registration (Communally Owned Land) Ordinance, 1962, is based on a system of registered rights but not registered conveyancing. (Ch. 5, Para. 2.8).

(1) e.g. Statement by A.D.O. in 1963/64 of the witnessing of a transfer of land in the Rabaul Sub-District Office File 35.10.2.

- (v) Localised Registration and Conveyancing of Customary Rights.
- (a) Gazelle Local Government Council Registration of Native Land Transactions.

It appears that a register book of transactions was begun about 1957, but it contains a transaction as far back as early 1951. The book is held at the Council Offices in Rabaul.

Unlike most native custom in Papua and New Guinea, Tolai custom allows for negotiability in land rights. The Council has made no rule concerning the register, it is strictly unofficial. There is no compulsory use of the register and it has not been given wide publicity. However, the increase in entries indicates a growth in popularity since 1964.

There is no guarantee of title but the register has proved to be a valuable record especially in this period of rapid change in Tolai culture. Frequently in Tolai custom the land is transferred but the price may not be paid for up to five years. The register has been very valuable in determining what the original agreement was and in clarifying disputes if the buyer or seller dies before the price is paid.

The description of the land is primarily by the name of ^{the} land. Disputes arise as to location and extent of transacted land. The size is often not given or given only approximately. Sometimes the land is indicated by a sketch (not necessarily to scale) with distances shown in fathoms, yards or feet. At times, distances are shown but the units of measurement are omitted.

(b) Local Government Council Registers of Rights.

The Higaturu and Ambenob systems were systems of registered usufructuary rights but not registered conveyancing (Ch. 6, Para. 2.3).

No system of registration under Section 54 of the Local Government Ordinance (Ch.5, Para. 1.10, 2.10) has been devised.

.2 COMMENTS

Basically the Australian pattern has been perpetuated:-

- (i) Registers are kept by various Government Agencies to varying standards. However, the registration of Crown/Administration leaseholds at the Registrar of Titles is a commendable improvement.
- (ii) Although dual registration systems for freehold land have been avoided, various systems have been permitted to evolve for the registration of native customary rights (viz. registration under Land Registration (Communally Owned Land) Ordinance.

Genealogy Register of the Land Titles Commission, recording of findings at Land Titles Commission, Local Government Registers of transfers and rights).

In addition, registered conveyancing has not been adequately provided for in these systems.

2. THE NEW GUINEA REGISTRATION ACTS AS SUBSTANTIVE LAW.

.1 SEISIN-PRESCRIPTION AND LIMITATION

Because the Register of Communally Owned Land is not kept up-to-date (Ch. 5, Para. 2.8) it must be assumed that the doctrine of seisin is relevant.

The New Guinea Torrens Ordinances are silent regarding the acquisition of rights by possession.

.2 ABSOLUTE AND RELATIVE OWNERSHIP.

Land registered under the Real Property Ordinance and Land Registration Ordinance has been subjected to the unfortunate and confusing legacies of medieval land law. The term "fee simple" is inappropriate in the Territory of New Guinea as there is no Crown Sovereignty. In recognition of this, the New Guinea Land Titles Restoration Ordinance was amended in 1955 to allow for the Administration to be described as "absolute owner" of restored titles. (Sec. 17 (2B) N.G.L.T.R.O.).

.3 MORTGAGES

The mortgage is a statutory legal charge (Sec. 47, R.P.O., Sec. 107 L.R.O.).

Statutory remedies are:-

- (i) Power to receive rents and profits
(Sec. 52 R.P.O., Sec 113 (1) (a) L.R.O.)
- (ii) Right to obtain possession
(Sec. 52 R.P.O., Sec. 113 (1) (c) L.R.O.)
- (iii) Power to distrain
(Sec. 52 R.P.O., Sec. 113 (1) (b) L.R.O.)
- (iv) Power to sell
(Sec. 48, (2)-(5) R.P.O., Sec. 180 (2)-(5) L.R.O.)

Some of these remedies do not operate or only partially operate for tenure converted land (Ch. 5, Para. 1.7, 2.7).

Equitable mortgages may also be created by the deposit of the instrument of title (Sec. 58 R.P.O., Sec. 119 L.R.O.). The mortgage may be protected on the register by a **caveat**. Common law remedies are available upon application to a Court of Equity.

.4 REGISTRABLE AND NON-REGISTRABLE RIGHTS.

The Land Registration (Communally Owned Land) Ordinance only permits "owners" of native land to be registered. It is not clear what customary right-holders are to be considered as "owners". The decision is left to the Land Titles Commission (Sec. 5 L.R. (C.O.L.) O.). It appears to be Land Titles Commission policy to direct the registration of the allodial ownership of group territories only. (1)

The Real Property Ordinance and Land Registration Ordinance, on the other hand, are very specific with respect to registrable and non-registrable rights:-

(i) Corporeal Hereditaments.

The estate in fee simple is the right against which all other "encumbrances, liens and interests are notified". (Schedule 1, R.P.O., Schedule 5, L.R.O.).

(ii) Incorporal Hereditaments.

(a) Reversions and remainders may be registered and Certificates of Title issued for them (Sec.88 (6). R.P.O., Sec. 89 (1) L.R.O., Sec. 35, 36 R.P.O.). Alternatively, registration may be by means of a memorandum on a Certificate of Title. (Sec.110 R.P.O. Sec. 76, L.R.O.)

(1) Ref. 85.

(b) Estates Without Possession

An easement is capable of creation by grant, transfer or will. A Certificate of Title thereof will be issued on request (Sec. 72 R.P.O., Sec. 133 L.R.O.).

Alternatively the easement may be entered by a memorandum (Sec. 71 R.P.O., Sec. 132 (1) L.R.O.)

(c) Other Registrable Rights

The registered owner in the Territory of New Guinea may register by memorandum, native rights in the name of the Director of District Administration as trustee for the natives (Sec. 132 A. L.R.O.).

(d) Non-Registrable Rights

A registered proprietor is protected by the Assurance Fund even if he has been notified of an equitable interest outside the Register (fraud excepted) (Sec. 87, 30 R.P.O., Sec. 148 (3), 69 L.R.O.). However, equities may be enforced against owners as if the Ordinances had not been passed (Sec. 87 R.P.O., Sec. 148 L.R.O.).

Fiduciary relationships are kept off the Register (Sec. 86 R.P.O., Sec. 145, L.R.O.).

Encumbrances, covenants and conditions etc. may be protected on the Certificate of Title (Sec. 26(5), R.P.O., Sec. 64 (5) L.R.O.) by lodgement

of a caveat or the registration of an instrument of transfer which includes the creation of the encumbrance (Sec. 28 (1) R.P.O., Sec. 67 (2) L.R.O., Schedule 7, R.P.O., Schedule 14, L.R.O.).

The transfer of minor rights is limited by the rigidity of forms.

.5 CO-OWNERSHIP.

The Australian Co-ownership concepts have been perpetuated (Sec. 108, 111 R.P.O., Sec. 74, 190 L.R.O.).

.6 LEASEHOLD INTERESTS

The distinction between personal and real property in land has been further diminished under the Real Property Ordinance and Land Registration Ordinance by the registration and dealing of leaseholds over Crown/Administration land in an identical way to freehold land.

.3 THE REAL PROPERTY ORDINANCE AND LAND REGISTRATION ORDINANCE AS MACHINERY MEASURES

.1 MIRROR PRINCIPLE

Facts which are not shown on the Certificate of Title are:-

those incapable of registration:-

- (1) trusts (Sec. 86 (1) R.P.O., Sec. 145 L.R.O.)
- (2) adverse possession
- (3) other equitable interests.

those not to be registered:-

- (4) short term leases (Sec. 29 (d) R.P.O.,
Sec. 42 (1) L.R.O.)
- (5) native customary tenures (Sec. 41 (1)
L.R.O.)
- (6) leases of land on which there is a building
which is the property of the Administration
Sec. 69 (6) L.O.)

(i) Unambiguous Definition of Parcels, Persons and
Rights.

Legal definition of rights and rightholders
is almost identical to the Australian system.

The definition of parcels is a little less
ambiguous than the Australian survey system, as a
correlated system of surveys is employed (Ch.16)

(ii) Maintenance of Record.

As the volume of work rapidly increases with
tenure converted land and communally owned land
registration, a reappraisal of methods in terms of
modern management principles is inevitable.

(a) Mutations

Where the parcel is not subdivided, the trans-
feree has the option of the issue of a new Certificate
of Title or the retention of the old Certificate of

Title with a memorial thereon (Sec. 35 (3) R.P.O., Sec. 88 (3) L.R.O.). Tenants-in-common may hold one Certificate of Title for the entirety of the parcel or separate titles (Sec. 108 R.P.O., Sec. 74 (2) L.R.O.).

In the case of subdivision, the transferor has the option of retaining a partially cancelled original Certificate of Title or obtaining a new Certificate of Title (Sec. 35 (4) R.P.O., Sec. 88 (4) L.R.O.).

With increased business, the Registrar of Titles may need to control such flexibility.

The New Guinea Registry does not use plans as a key to the Registers. This is because few plans are filed at the Registry (Ch. 16 Para 1.3 (ii)) and the registry has inadequate staff for charting.

(b) Purging of Dead Matter

The accumulation of dead matter has not reached problem proportions yet.

.2 CURTAIN PRINCIPLE

Charges and Encumbrances must be entered in the Register Book (Sec. 46 (2) R.P.O., Sec. 106 (2) L.R.O.). However, the Land Registration Ordinance permits the enforcement of statutory obligations without registration (Sec. 68 (f) L.R.O.).

.3 INSURANCE PRINCIPLE

(i) Legal Effect and Guarantee of Registration

The Certificate of Title is conclusive evidence in all courts of justice (Sec. 19, 26 (5) R.P.O., Sec. 57 L.R.O.).

Circumstances where a Certificate of Title is not held paramount are:-

- (a) Fraud
- (b) Wrong description of land or of its boundaries.
- (c) Claims of a prior Certificate of Title or lease instrument.
- (d) An omission or misdescription of any right-of-way or other easement.
- (e) A tenancy of up to 3 years.

The Assurance Fund is not readily available for claims of indemnity. For example:-

- (1) A fruitless attempt to recover a deprived estate or interest must be pursued prior to a claim against the Fund (Sec. 141 (1) R.P.O., Sec. 170 (1) L.R.O.).
- (2) In cases of fraud and forgery the Fund does not appear to be available (Sec. 29, 144, R.P.O., Sec.68, 174, L.R.O.).

(3) Cases of omission or mistake by the Registry:

Court action must be brought against the Registrar as nominal defendant.

(4) Persons deprived of land under decisions of the

Land Titles Commission: Compensation is only available if it^{is} not recoverable under any law in force in the Territory and must be by means of a Supreme Court order (Sec. 41, L.T.C.O.).

.4 INITIAL REGISTRATION

(i) Method of Initial Registration

The Register Books are registers of all land alienated or leased by the Crown/Administration (Sec. 14(i), 16 (i), 44 L.R.O.).

Registration is sporadic because of the haphazard pattern of land acquisition by the Crown/Administration from the natives.

(ii) Validity of Initial Title

The whole system of titles over Crown/Administration land is set upon an insecure foundation (Ch. 6, Para. 4.6 (ii) (1), Appendix 5).

When Crown/Administration land is first brought onto the Torrens registers, the Registrar of Titles does not thoroughly investigate the Administration's title. In fact, as the Native Land Dealings Register is unofficial, the Registrar of Titles is not compelled to regard it at all.

The only registered titles which have a sound root are:-

- (a) Those titles which were transferred from the Grundbuch. These were thoroughly investigated for anterior defects, including native claims.
- (b) Those titles registered under the Land (Tenure Conversion) Ordinance. Upon tenure conversion, all previous customary rights become null and void.

Land registered under the Real Property Ordinance and Land Registration Ordinance is protected to the extent that where the Land Titles Commission finds a conflict of title, the registered title prevails (Sec. 16 L.T.C.O.).

(c) Limited or Presumptive Title.

There is no provision for presumptive titles under the Real Property Ordinance and Land Registration Ordinance.

Section 24 of the Native Land Registration Ordinance is the only case where presumptive titles have been permitted under Papuan and New Guinean land registration law.

Titles limited as to parcels (subject to survey) are permissible under:-

- (1) Real Property (Registration of Leases)
Ordinance, 1962. (Ch. 5 Para 1.9, 2.9)
- (2) Land (Tenure Conversion) Ordinance, 1962
(Ch. 5, Para. 1.7, 2.7, Ch. 6, Para 3.3(x)(e))

.5 TRANSACTIONS

(i) Sale and Purchase

(a) Preliminary Contracts of Sale.

Common practice has been to use preliminary contracts for sale.

(b) Requisitions by Purchaser to Vendor.

Identification surveys are usually necessary.

(c) Identification of Vendor.

As per Australian practice.

(ii) Professional Assistance in Transactions.

As per Australian practice.

(iii) Use of Standard Forms.

A penalty may be levied in the case of non use of standard forms (Sec. 14, R.P.O.)

However, the following cases allow for a reasonable degree of flexibility:-

- (a) Forms may be varied "as the character of the parties or of the circumstances of the case render necessary" provided there is no variation in matter or substance (Sec. 5, R.P.O., Sec. 5, L.R.O.).

(b) The Registrar may, subject to the Administrator's approval, make alterations in the forms as he deems requisite (Sec. 13, R.P.O.).

(c) The Registrar may " in the event of great loss or inconvenience" accept any instrument not on a prescribed form (See 126 B R.P.O., Sec. 83(1) L.R.O.)

.6 POWERS OF THE REGISTRAR

(i) Quasi-Judicial Powers

The main quasi-judicial powers are:-

- (a) to call for and inspect documents
- (b) to summon and examine witnesses
- (c) to administer oaths
- (d) to correct errors
- (e) to enter oaveats

(Sec. 15, R.P.O., Sec. 11 L.R.O.)

(ii) Administrative Powers

Examples of excessive administrative rigidity are:-

(a) The Registrar needs the Administrator's approval prior to alterations in the statutory forms.

(b) The Registrar does not have power to regulate levees for the Assurance Fund so that it is maintained at a satisfactory level.

(c) The Registrar does not have power to determine whether or not minor rights are registrable.

(iii) The Community's Needs

As per Australian practice.

.7 REGISTRY SERVICE.

(i) Centralised Administration and Service.

Prior to World War II there were Registries at Rabaul and Port Moresby. Since World War II all registry operations have been concentrated in Port Moresby.

(ii) Availability of Records

The binding of the Register Books is required. (Sec. 18, 32 R.P.O., Sec. 6 (1), 84 L.R.O.). However, a loose-leaf system is used to facilitate searching.

4. CONCLUSION

.1 The Australian Torrens concepts have been transplanted with little modification or adaption to the New Guinea situation. The application of the Torrens System to Crown/Administration leasehold tenures is an exception.

Several concepts of English land law, which have been the result of history rather than logic, have been transplanted. For example: the doctrine of estates; the distinction between law and equity, and real and personal property in land; the doctrine of corporeal and incorporeal hereditaments.

.2 There is no registration of deeds system as in Australia. This is obviously advantageous. However, no alternative provision has been made for the registration of rights which are not permitted to be registered on the Torrens Registers. Such rights may merely be noted on the Certificate of Title or documented by private conveyancing.

GENERAL REFERENCES.

CHAPTER 13

FUTURE LAND REGISTRATION CONCEPTS AND PRACTICES -
A MODEL

1. REGISTRATION AND CONVEYANCING SYSTEMS

.1 REGISTRATION OF ALL LANDED INTERESTS UNDER THE
CONTROL OF ONE AGENCY

Advantages:-

- (i) The search of landed interests is facilitated.
- (ii) The inefficiency of various governmental agencies operating land records sections is eliminated.
- (iii) A specialist recording agency can give adequate attention to keeping recording methods up-to-date and to the training of personnel.

.2 NUMBER OF LAND REGISTRATION SYSTEMS

There is no reason why one land registration system could not be devised to encompass all land in the Territory. However, the disadvantages are:-

- (i) The system would need to be so flexible that simplicity might be impaired.
- (ii) The Administration desires to distinguish between individualised and customary tenures with different registration systems. (1) Therefore, for the present, two registration systems should operate - one for individualised tenure and one for customary tenure.

(1) Ref. 85

The Administration's long-term objective of one registration system based on individual titles is illusory. At least 50% of the total surface area will not be used in the modern marked economy in the foreseeable future:-

"The main consequence of the rough, broken topography is to make a very large proportion of the land virtually unusable for agriculture and forestry for reasons of contour alone", (1)

Utilisable Land Resources

<u>Land Use</u>	<u>% of Land Surface</u>
Sedentary agriculture	5 (2)
Pasturage	8.5 (2)
Forestry	25.5 (2)
Industrial, Mining, Urban and Miscellaneous	<u>11</u>
	50

(1) P.63 Ref. 221

(2) P.67 ibid

To introduce individualised titles over the 50% not used in the market economy would be unnecessary and unsuited to native land use and social structure.

.3 GENERAL NATURE OF THE REGISTER OF CUSTOMARY LAND.

The "static" Register created under the Land Registration (Communally Owned Land) Ordinance (Ch. 5, Para 1.8, 2.8) is inappropriate. Also, the cost and manpower demand of systematic adjudication, demarcation and survey of all lands in the Territory cannot be justified if the register so created is only to be used "in connection with future acquisitions or conversions of title" ⁽¹⁾(Ch. 7, Para. 3).

If the creation of a universal cadastre is considered beneficial (Ch. 2, Para 3, Ch. 7, Para 4), the customary registration measure must provide for:-
(i) compulsory registered conveyancing.
(ii) a register of individual and group rights which is as "complete" as is practical.

(1) Ref. 85.

2. SUBSTANTIVE LAW RELATED TO REGISTRATION

.1 SEISIN - TITLE BY POSSESSION

Legislation cannot continue to be neutral as cases of adverse possession will inevitably arise. Recognition of the acquisition of a right by possession is necessary because:-

- (i) Such a doctrine brings the law into line with fact. A just and equitable recognition must be made of a de facto situation.
- (ii) A consistent law of boundary evidence is impossible without this doctrine. Where boundaries cannot be relocated from monuments, the de facto boundary (fence, line of trees etc.) must be used as evidence of the de jure boundary. (1)
- (iii) Land resources are more likely to be utilised by interested owners who are in possession of the land.

A registered rightholder should have recourse to the Assurance Fund or the State Treasury for loss of title by possession.

- (1) e.g. Equitable Building and Investment Co. V Ross (5 N.Z. L.R.S.C. 229)
Turner V Myerson (18 N.S.W. S.R. 133)

.2 ABSOLUTE OR RELATIVE OWNERSHIP

The concept of allodial ownership is applicable to Papua and New Guinea because:-

- (i) the concept is not foreign in traditional society. Tribal and clan land is often held "absolutely".
- (ii) the concept is suited to a modern market economy.

The State only requires a general sovereignty over land to ensure wise land utilisation and the equitable distribution to the society of royalties accrued from land development.

.3 MORTGAGES

The system of statutory mortgages should be encouraged amongst indigenes.

The value of continuing the alternative system of equitable mortgages is debatable.

Remedies have been so restricted in the case of tenure converted land that the nature of the mortgage right has been altered. Certified lending authorities must be exempt from the restrictions, to encourage secure mortgaging (Ch. 5, Para. 2.7 (v)).

.4 REGISTRABLE AND NON-REGISTRABLE RIGHTS.

The following concepts should be discarded on the grounds of inapplicability:-

- (i) The distinction between corporeal and incorporeal hereditaments.
- (ii) The distinction between "real" and "personal" interests in land.
- (iii) The distinction between law and equity.

All rights which are permanent, semi-permanent or ephemeral must be classed as "registrable" on the Customary Tenure Register. However, every attempt must be made to avoid cluttering the Register with the intricate details of customary statutes, rights and obligations of individuals. The Registrar and the rightholders must be given maximum flexibility in how best to register particular parcels.

The notation of trusts is recommended as one solution.

The Genealogy, Transfer of Rights and Local Land Law and Custom Registers (Ch. 7, Para 4.2 (iii) (e)) must be used as supplements to the main Customary Tenure Register. As the customary tenure systems gradually simplify with cultural change, (i.e. tend toward individualisation) use of the Genealogy and Transfer of Rights Registers must decrease until a single Customary Tenure Register remains.

The Register of Individualised Tenure must permit the registration of some minor customary rights. Multiple extra-legal rights based on customary principles are already emerging in lands leased from the Crown by Papuans.⁽¹⁾ The regulated registration of these rights by a decentralised Registry will avoid a whole new system of non-registered rights building up over parcels upon which tenure rationalisation has already taken place.

.5 CO-OWNERSHIP

The western co-ownership concepts are seldom relevant to traditional tenure systems. Group lands are not held "in common" and it is not usual to find particular rights or obligations held in common.

The formation of a native group into a body corporate is another important means of multiple ownership registration which has been overlooked in New Guinea registration legislation.

3. MACHINERY CONCEPTS

.1 MINOR PRINCIPLE

- (i) Unambiguous Definition of Parcels, Persons and Rights.

Refer Ch. 17.

(1) Ref. 44

Definition of Rights and Rightholders: The format of the customary tenure register will need to be flexible. Where the rightholders are to be represented by trustees or a body corporate or where individual use rights only are to be registered, the Australian "Certificate of Title" format would be satisfactory. Where the multifarious customary rights are required to be registered, the various types of rights ⁽¹⁾ would be registered on separate pages (similar to the Grundbuch register).

(ii) Maintenance of Record

(a) Mutations

Large scale maps should be used as a key to the Register.

Each parcel would be numbered within the rectangular cadastral unit. The cadastral unit would be a suitable subdivision of the projection zone (Ch.17, Par. 8.4,.5). When a parcel is subdivided or consolidated, the resultant parcels would be given new numbers. Records of the original parcel would be filed as obsolete matter.

(1) e.g. rights of direct use, rights of control, rights of disposal, etc.

The parcel number should serve as the primary title reference. There is no need for a separate title referencing system. Particular rights can be indicated by an additional reference number.

Records should be filed in the Register consecutively according to the "living" parcel numbers.

(b) Purging of Dead Matter

A loose-leaf system is essential.

.2 CURTAIN PRINCIPLE

A Genealogy Register and a Transfer of Rights Register (Para. 2.4) need not interfere with the Curtain Principle so long as they perform a transitional function until such time as the data contained therein can be suitably registered in the Registers of Customary Tenure or Individualised Tenure.

.3 INSURANCE PRINCIPLE.

(i) Guarantee of Registration

Applications for rectification of the register or for indemnity due to loss should be regarded as complementary remedies. Remedies should be simple and inexpensive. Court proceedings should be avoided due to the cost and native unfamiliarity.

.4 INITIAL REGISTRATION

(i) Method of Initial Registration

Compulsory systematic adjudication and demarcation should be employed.

The present method of working sporadically within Adjudication Areas is inefficient, uneconomical and unsuitable for survey operations (Ch.7, Para. 3.4(iii)).

(ii) Limited Title.

A Land Titles Commissioner should have the power to declare a right or title to be presumptive where he considers it appropriate. A suitable maturing time for the "limited" title would be 5 years (cf. Sec.24(3) N.L.R.O.).

Such a provision would minimise investigational and court hearing time, thus expediting adjudication and demarcation.

.5 TRANSACTIONS

A system of verbal conveyancing is most suited to the native population and would frequently be found suitable for the expatriate population. The system of preliminary contracts for sale should be permitted also.

Verbal conveyancing should be carried out before a licensed notary or Registry official.

Because of the complexity of customary land tenure systems and the alternatives which should be available for registering communally owned or controlled land, the Registrar must have power to alter forms without the Administrator's approval. However, the Administrator should have power to periodically review the Registry's activities to ensure that simplicity is maintained and multifarious forms are avoided.

As population mobility increases, the identification of transferee and transferor could be facilitated by the issue to each individual of a "land rights booklet". This booklet would contain "extracts of rights" registered in the Land Registers. Booklets would be compiled from the Rightholders Index of the Registry. Native response to such a scheme has not been evaluated.

Requisitions by Purchaser to Vendor: Identification surveys must be avoided because of cost to the small landholder and the scarcity of surveyors. A survey system can be devised such that suitable evidence of boundaries is available without an identification survey in the majority of cases.(Ch.17).

.6 POWERS OF THE REGISTRAR.

The Registrar must have maximum flexibility in administration to cope with situations as they arise, to meet changing needs in the community and to apply modern management techniques as they become available.

His judicial powers should be extended so as to avoid unnecessary court proceedings, e.g. the determination of indemnities against the Assurance Fund or State Treasury and the determination of simple successions upon death.

.7 REGISTRY SERVICE

(i) Decentralisation

The advantages of a decentralised Registry Service are:--

(a) In the traditional New Guinea society, the land is inextricably linked with the social, economic and religious life. Land registration secularises land administration.

The conflict and contradiction between the old culture and new institutions can be minimised by localising the Registry as much as possible.

(b) To a parochial people the centralised activities of the Administration are enigmatic.

(c) Even when the process of individualisation is well established, the creation of extra-legal rights between individual, extended family and clan can be expected.⁽¹⁾ Regular inspections by local Registry officials are necessary to determine these rights and to arrange registration where necessary.

(d) Even where land transfers inter vivos are uncommon, mutations on death are inevitable. Indigenes will require education from local officers on the purpose of land registration and encouragement to use Registry facilities.

(e) The simplest system of conveyancing is verbal conveyancing before a local Registry official or notary.

(f) The Registry can be used as an agent in land reform education (e.g. the individualisation of tenure).

(g) The local Registry inspector can examine each case of fragmentation on its merits.

(ii) Availability of Records for Searching

A loose-leaf binding system should be used for all registers.

(1) Ref. 202 and Ref. 44 (Para. 2.4)

From the point of view of title searching, there appears to be little advantage, in the foreseeable future, in storing Registry data in electronic memory devices. However, from the point of view of data searching for research and planning, there would be great advantage in storing Registry data in a computerised land data bank.⁽¹⁾

(1) Ref. 217

GENERAL REFERENCES.

1, 9, 13, 20, 21, 22, 40, 55, 56, 57, 60, 61, 62, 76, 80, 81, 93, 94, 107, 116, 118, 119, 133, 143, 160, 165, 169, 175, 178, 180, 187, 205, 207.

CHAPTER 14

AUSTRALIAN CADASTRAL SURVEY CONCEPTS AND BASIC PRACTICES⁽¹⁾

1. INTRODUCTION

For the purpose of brevity New South Wales has been chosen for case study. Variations in practice and attitudes do exist from State to State. Adequate allowance therefore, may not have been made.

2. TECHNICAL CONCEPTS AND PRACTICES

1. EQUIPMENT

Legislation has tended to remove Australian cadastral practice from possible benefits of electronics and numerical photogrammetry. Both Lands Department regulations and Survey Practice regulations in New South Wales still necessitate the exclusive use of theodolite and steel band for all cadastral surveys.⁽²⁾

.2 METHODS

Given the technology of theodolite-band, Australian practice has preferred traversing to the exclusion of almost all other methods.⁽³⁾

(1) This Chapter is an abridged version of a paper presented by the author at the Australian Survey Congress Sydney, Feb. 1967.

(2) Sec. 1.8, Ref.122; Sec.10, Ref.151.

(3) e.g. triangulation, trilateration, resection and intersection.

The reasons are relevant:-

(i) Longstanding belief that "the best measurement is the most direct one" - perpetuated by legislation⁽¹⁾

This has been a safeguard as no systematic use of error analysis is apparent in Australian cadastral practice. An understanding and application of error analysis and the calculus of observations is essential if indirect measurements are to be used extensively.

(ii) Lack of low order horizontal control. Use of triangulation, resection, intersection is limited without a basic network.

(iii) Traversing has been well suited to the Australian terrain and climate.

(iv) Isolation from methods used elsewhere in the world.

A particular technical method is not basic to the end result. Methods need to be chosen in the light of accuracy required, and the human, physical and financial resources available.

(1) Sec. 13, Ref. 151.

.3 MONUMENTATION

(i) Corner Marking and Boundary Marking

Boundaries have been defined by corner marking rather than by boundary features.

Boundary marking in the form of line pegs every 10 to 16 chains has been common.

Corner marking is satisfactory among literate peoples. Marking by boundary features has distinct advantages amongst semi-literates.

(ii) Reference Marks and Witness Marks

Reference marks are now used extensively in Australian practice.⁽¹⁾ However, witness marks⁽²⁾ are seldom used and are not required by legislation.

The absence of witness marks necessitates an extensive resurvey when boundary relocation is required. "Relocation" (or redetermination) of boundaries has become synonymous with "resurvey". Inordinate duplication of work has been a consequence.

A resurvey is not essential to the basic process of relocation.

(iii) Nature of Marks

(a) Durability: The stability of the Australian cadastral system owes much to the use of durable hardwood marks.

(1) Sec. 19-24, Ref.151

(2) refer to Glossary for meaning of "reference" and "Witness" marks.

- (b) Visibility: Practice has not been to make corner marks conspicuous. Wooden pegs are difficult to find. Stone cairns and iron stakes are seldom used. This has tended to aggravate the necessity for extensive resurveys.
- (e) Reference Marks: The use of the reinforced concrete block and rock mark has stabilised the survey system. However, the most common reference mark, the G.I. pipe, is far from satisfactory.

The nature of survey marks should be determined in the light of the local physical and social environments.

.4 DATUM OF SURVEYS

The Australian cadastral system was a system of isolated surveys ⁽¹⁾ until the introduction of the Survey Co-ordination Acts. Continual difficulty now arises when previous surveys do not conform to each other due to absence or insufficiency of connection. It is reported that a regret of Sir R. Torrens was that he was unable to include in the South Australian Real Property Act a provision for indefeasibility and

(1) See Glossary for definition.

indisputability of landmarks and boundaries due to the system of isolated surveys.⁽¹⁾

.5 HORIZONTAL CONTROL

It is imperative to understand what is meant by "survey co-ordination" in Australia. The Survey Co-ordination Acts provide for "..... the establishment of permanent marks for the convenient connection of local or general surveys to the State triangulation survey." (2) The words "co-ordination" and "connection" are synonymous in the Act. "Connection" means "tieing into" not "working out from".

The Acts do not destroy the basic principle of an isolated system: that of working from part to whole. They do attempt to modify this principle by introducing a system of correlated surveys. That is, the parts of the whole may be connected to an unconnected whole.

The Acts do not facilitate the diversification of survey methods because a plane co-ordinate system for general use has not been introduced with them.

(1) Ref. 207

(2) Ref. 155, Sec.11 (1)

The Acts do not perceive the various fields of survey operations (1) as comprising an integrated and systematised whole. Rather they maintain these fields as mutually exclusive (2) and provide only for connection between them.

The full exploitation of a horizontal network of control is not possible if it is used only as an aid to connecting surveys rather than as an essential for survey.

.6 ACCURACY

(i) Numerical cadastre.

The reasons for the early adoption of a numerical cadastre were:-

(i) Purpose of cadastre: Basically for legal definition of parcels.

(ii) Alienation surveys: Because alienation of Crown Grants was involved, accurate computation of areas was required.

(iii) The isolated system: Because of the nature of the isolated survey system, the definition of independent units needed to be as accurate as technology would permit. A numerical cadastre tends to compensate to some degree for the disadvantages of an isolated system.

- (1) The cadastral, topographic, photogrammetric, engineering, hydrographic, mining, geodetic.
- (2) An exception is the production of large scale cadastral-topo. maps in several Lands Departments.

(ii) "Appropriate Accuracy".

The degree of accuracy for the numerical cadastre has been chosen on the basis of a specified technology. The "appropriate accuracy"⁽¹⁾ required is "such accuracy as is reasonably possible of attainment in any particular survey"⁽²⁾. The term "reasonably possible" only has meaning when a certain technology is assumed. The theodolite-band technology is clearly specified.(Paragraph 2.1).

It is interesting to note that "appropriate accuracy" is independent of land use, value or classification.

(iii) Relative Accuracy.

The quantitative specification of "reasonably possible" has been made in terms of permissible relative accuracy.⁽³⁾ There is no specification of the position accuracy of ground points.

By so defining accuracy, a certain technology has again been assumed. As accuracy is proportionate to distance, optical distance measuring techniques cannot be used except for very short distances.⁽⁴⁾

(1) Sec.8 , Ref. 151.

(2) Sec. 5, (1), *ibid*

(3) Sec. 44, *ibid*.

(4) P. 343. Ref. 216

Similarly, the absolute position fixing technique of photogrammetry is difficult to apply except for long distances.⁽¹⁾

The specification of accuracy in terms of a technology is not essential to a cadastral operation and can be a hindrance to technological progress.

.7 COMPUTATION

(i) Area Computation

Survey Practice Regulations limit area computation to the double longitude method.⁽²⁾ This method is not particularly suitable for plane co-ordinate computation.

(ii) Adjustment of Measured Data

Survey Practice Regulations permit the adjustment of latitude and departures for area computation.

(2) It is not clear whether measured angles and distances may be adjusted. In practice many surveyors only adjust angular measurements.

(1) P. 156-7 Ref.100

(2) Sec. 41, Ref. 151

The non distribution of linear misclose and the regulated method of area computation have curbed the use of rectangular co-ordinates to such an extent that the advantages of co-ordinate computation are not fully appreciated.

3. ADMINISTRATIVE CONCEPTS AND PRACTICE

.1 EXAMINATION AND OVERSIGHT OF SURVEYS

(i) Maintenance of Standard of Accuracy.

No quantitative test is applied in Australian practice to ensure the maintenance of the accuracy of individual linear measurements. Only a general test of consistency for a sequence of measured angles and distances is required in the form of a "closed traverse". The control of survey standards in Australia is basically dependent on this "permissible error of closure" test. Other less important tests are:-

- (a) permissible angular error of closure
- (b) astronomic azimuth check in long traverses.

Both of these are general consistency tests also. Features of the "permissible error of closure" test are:-

- (1) It only tests the self-consistency of the closed traverse. It does not verify the accuracies of the individual angular and linear measurements.

(2) It does not test for systematic errors.

(3) It does not test the absolute accuracy of traverse points.

(4) It does not uncover compensating errors.

The above tests are inadequate unless augmented by professional liability.

(ii) Survey Investigation and Examination

Because of the system of isolated surveys it has become the task of the survey investigator to attempt to fit surveys into some cohesive whole.

Features of the Australian system of examination and check of surveys are:-

(a) Accuracy: Accuracy can only be checked by the tests mentioned in 3.1 (i).

(b) Standard of Measurement: No check on systematic error in linear measurement. The surveyor is responsible for standardisation of bands.

(c) Datum and Azimuth: Difficulty in choosing satisfactory datums and azimuth in an isolated system.

(d) Examination of Field Books, Working Plans and Computations.

Only the surveyor's plan is examined at the Registrar General's Department.

(e) Principles of Boundary Definition: The main purpose of investigation is to ensure "that the boundaries defined by the surveyor's plan are those comprised in the relevant title document."⁽¹⁾ Thus the investigator is primarily concerned with the correctness of the weighting of the admissible evidence.

(f) Data Relating to Evidence Found: The investigator seldom makes a detailed analysis of the boundary evidence collected by the surveyor. In fact, the surveyor's plan gives little descriptive detail of the boundary evidence found or of the reasons for its adoption or rejection. It is the surveyor's quasi-judicial responsibility to sift the evidence into admissible and non admissible.

These features demonstrate the degree of responsibility entrusted to the cadastral surveyor. Survey Investigation tends to cover only those areas of the cadastral operation which cannot be fully covered by professional liability.

(1) P2 Ref.219.

.2 LAND MANAGEMENT

(i) Records of Cadastral Data

There are three types of Government Agencies responsible for recording cadastral survey data:-

(a) Registrar General's Department.

(b) Lands Department.

(c) Miscellaneous Agencies. e.g. In New South Wales: Water Conservation and Irrigation Commission, Western Lands Commission, Main Roads Department, Maritime Services Board, Sydney City Council, Public Works Department, Railways Department, Mines Department, Water Boards.

(ii) Statutory Regulation of Survey Practice

Statutory control of survey practice frequently stems from two sources:-

(a) Registrar General's Departments: oversight of Survey Practice Regulations.

(b) Lands Departments: oversight of Department of Lands Survey Directions.

(iii) Cadastral Units

"Island" cadastral units were adopted in Queensland, Victoria, New South Wales, Tasmania and Northern Territory because of the haphazard nature of land settlement. Their irregularity has discouraged

their use for statistical purposes apart from land administration.

In South Australia the units are basically of a "frame" nature because of planned land settlement. In consequence, Counties and Hundreds in South Australia still serve as the basis for agricultural and pastoral production statistics.⁽¹⁾

In Western Australia a "frame" series based on a large scale rectangular map sheet series has been adopted from the outset.

(iv) Cadastral - Topographic Mapping

Western Australia, Queensland, Tasmania and New South Wales have already seen the need to reconcile the isolated survey system to a geographic basis with large scale cadastral mapping.

(1) P.82, Smailes, P. J. "Large Cadastral Map Coverage in Australia and the Parish Maps of New South Wales". The Australian Geographer, Vol.10, No.2, Sept. 1966.

.3 THE SYSTEMS OF RECORDING TITLE AND SURVEY

The "Torrens Acts" were legislated in the Australian States between 1858 and 1874. The Acts were designed to cure the main procedural disadvantage of the system of Registration of Deeds. As such they concerned themselves primarily with the recording of title to land and not the recording of the Land itself (i.e. the survey)

Immediately after the introduction of these Acts great numbers of holdings (Crown Grants) were brought under their operation without survey. After approximately 20 years of experience under the Acts several States held Royal Commissions due to dissatisfaction with survey operations.⁽¹⁾ The main recommendations of the Victorian Commission were that ⁽²⁾:-

(1) A system of permanent survey monuments should be commenced.

(2) An examining surveyor should be appointed to the staff of the Titles Office.

(3) The Transfer of Land Act should be amended to enable a registered proprietor to have his title rectified on the basis of survey where he has been occupying his land in good faith over a period of years.

(1) Vict. Royal Commission, 1885; dates of others not known.

(2) Ref. 12.

- (3) was acted upon immediately.
- (2) was acted upon in 1945 when a staff of examining surveyors was established in the Victorian Titles Office.
- (1) was acted upon in 1945 with the introduction of the Survey Co-ordination Act.

A possible reason for the delayed response of 60 years with respect to (1) and (2) is that by the 1880's all surveyors were using the "new technology" theodolite and band. The accuracy attainable therewith enabled satisfactory descriptions of parcels to be made even though surveys were of an isolated nature.

The successful application of the theodolite-band method to land title surveys shortly after the introduction of the "Torrens Acts" has caused it to be inextricably associated with "The Torrens System". Furthermore, the whole cadastral system has become so linked with "The Torrens System" that Australian lawyers and surveyors find it difficult at times to divorce the two.⁽¹⁾ Yet the fundamental principles of recording survey data include only to a very minor degree those of recording title data.

(1) Even Mr. J. Ballman in Ref. 18 considers "The precision with which boundaries are described" to be one of the five virtues of the Torrens System.

In many respects the system of recording survey data resembles a registration of deeds recording system. In this sense the Australian cadastral survey system is not "a Torrens System." To incorporate it into "The Torrens System" tends to belittle the Torrens principles of recording data.

The Mirror, Curtain and Insurance Principles (Ch.10) are basic to any modern recording system irrespective of the type of data to be recorded.

(i) Mirror Principle

Under the system of land registration by deeds (1), all registered deeds form an essential part of a chain of title which may need to be traced back to the original grant. Similarly, the search of survey records in Australia requires the search of a chain of surveys. Any flaw or interruption in the chain of record weakens the validity and correctness of the written evidence.

(1) Ref.153

The "Torrens System" achieves the Mirror Principle by maintaining an up-to-date Certificate of Title for each parcel. Deeds of transfer are registered behind the Certificate of Title Register. Similarly, the mutations or resurvey of parcels can be currently recorded on large scale maps. Specific survey plans, field books, computations etc. can be filed as additional information if required.⁽¹⁾

The indexing of reference and charting maps common to many Australian Government Agencies does not satisfy the Mirror Principle. It facilitates searching "the chain" but does not provide for the current record of all survey data on one map.

In some Australian Agencies it is even necessary to search the title of the land in order to locate plans.⁽²⁾

(ii) Curtain Principle.

As shown in Paragraph 3.2(i) the records of cadastral survey data are scattered throughout several Government Agencies. The record of "the chain" does not exist at one location and in one register.

(1) Common practice in many continental countries.

P.89, Ref.57.

(2) e.g. N.S.W. Registrar General's Department : plans of subdivisions which have been annexed to dealings and filed therewith.

(iii) Insurance Principle

Because of the nature of the isolated system, the Insurance Principle has only been partially applied to cadastral surveys in Australia. Registrar General's Departments have attempted to remedy this by establishing survey investigation branches, whose task is to diminish the probability of flaws.

The uncertainty (insecurity) of land identification is exemplified by the inordinate number of Identification Surveys called for. An Identification Survey is found necessary especially by lending authorities because the method of definition and identification is not satisfactory for normal business negotiations (refer Ch.10 Para.3.1(i)).

The Torrens System has done away with the re-examination of legal facts by means of the Certificate of Title. However, the re-examination of the physical facts on the ground has been perpetuated. Sir. R.Torrens own comment that "survey is an expense once and for all"⁽¹⁾ does not hold in Australia.

(1) Ref. 105

Modern cadastration, especially in a developing country, must be run essentially as a business enterprise. Modern recording and management principles must be fully utilised.

4

LEGAL CONCEPTS

.1 TYPES OF ADMISSIBLE EVIDENCE

The types of evidence usable in retracement surveys are:-

- (i) Written evidence - document and plan records.
- (ii) Real evidence - field and office observations.
- (iii) Judicial Notice - knowledge of survey practice at the times of previous surveys.
- (iv) Oral evidence - use of witnesses.

Boundary redefinition surveys in Australia are based primarily on (i) and (ii).

Little information is available with respect to (iii). Surveyors are expected to gain such knowledge by experience.

(iv) is seldom used and is frequently regarded as an inferior type of evidence.

.2 THE LAW OF EVIDENCE

No clear, complete statement exists in the Australian States as to the law of boundary evidence. General legal principles are known to surveyors but no thorough study of case law has been made. The assignment of weight to various forms of evidence remains vague.

Due to the isolated nature of surveys, an inordinate amount of evidence may be required to produce a satisfactory degree of finality for the relocation of a boundary. The absence of a reliable control network can necessitate painstaking searching for a reliable datum and azimuth. Consequently, due to time and cost, all evidence is seldom collected. A major cause of disagreement between surveys has been the discovery and use of conflicting evidence.

A precise, well-ordered law of evidence is considered essential to the economics and simplicity of cadastration.

WORK ORGANISATION

The work organisation, particularly the division and specialisation of labour, has an important influence on the technical methods and procedures used.

.1 DIVISION AND SPECIALISATION OF LABOUR.

Although the number of technicians is increasing, there remains two distinct labour divisions in Australia: cadastral surveyor and the survey field hand. The cadastral surveyor is entrusted with the direct supervision of all technical operations. Because of his quasi-judicial function and his professional responsibility (liability) he is ascribed professional status. In contrast, his field hand is regarded as a semi-skilled labourer.

There is a trend in Australia to widen this division by improving the specialist qualifications of the registered (cadastral) surveyor. Some states have gone so far as to make a University degree a prerequisite of registration. In so doing, the standard of education is taken beyond the functional needs of cadastral operations in the existing Australian system.

In communities where financial and training resources are limited, the survey work organisation might follow a different pattern. Important considerations are:-

(i) The method of cadastration must be functional. The most efficient and realistic services

must be devised to fulfil the essential needs.

This will probably necessitate the use of various degrees of specialisation. The function of technician will be separated from that of technologist. In addition, various kinds and levels of technicians and technologists may be required.

(ii) The standard of education and training must be functional. A developing country cannot afford to educate above essential requirements.

(iii) The community will not have the financial resources to support a large professional elite. Only high level technologists and administrators could be ascribed professional stature. The majority of the routine work would be executed by sub-professionals.

(iv) Heavy reliance upon sub-professionals for routine work will necessitate field and office procedures which incorporate as many self checking methods as possible.

.2 RESPONSIBILITY FOR WORK

By legally defining the responsibilities of the registered surveyor, the Surveyors Acts have attempted to alleviate one of the fundamental problems in the Australian cadastral system - liability for surveys. As Government Agencies cannot be liable the registered surveyor has been made personally liable.

for inaccurate or negligent surveys and fraudulent activities.⁽¹⁾ ⁽²⁾ A registered surveyor must personally execute or supervise every cadastral survey.⁽³⁾ He is personally liable for the immediate oversight and direction of the survey.⁽⁴⁾ This liability has proved to be one of the greatest deterrents to substandard work in a survey system where no satisfactory method of checking exists.

The professional stature of Australian cadastral surveyors is, in part, derived from the necessity for personal liability. Liability as a result of personal judgement is one attribute of a profession.⁽⁵⁾ A state guaranteed, integrated system of surveys places little importance on the personal liability of field surveyors. Despite the advantages of such a system from the viewpoint of efficiency and economy, reform to this end has been limited to the Survey Co-ordination Acts. These Acts incorporate some of

(1) Sec.14, Ref.152

(2) In addition, the surveyor is liable at common law for breach of contract, and negligence or deceit with respect to professional activities.

(3) Sec. 12 (1), Ref.152

(4) Sec. 7, Ref. 151

(5) P.460, "Evidence and Procedures for Boundary Location" Brown C.M. & Eldridge W.H. John Wiley and Sons 1962.

these advantages without interference to the surveyor's personal liability. It is possible that further reform is inhibited by fear of jeopardy to professional status.

The antipodal situation is where registration is done away with. Cadastration is undertaken by a government authority as a purely technical operation executed by technicians under the supervision of qualified superiors. This arrangement has the advantage that professional status of field staff is unwarranted. This is desirable in a developing country (Para. 5.1 (iii)).

Although state registration is not essential it will be desirable where the government cannot or will not undertake the whole operation. Frequently, in a developing country a solution must be found where a minimum number of registered surveyors are required for the desired work output.

6

CONCLUSION

The settlement of the vast unoccupied lands of Australia has required the marking out of parcels by survey. "Land Boundary Definition" is the basis of parcel identification and lies at the root of the title.

Despite disadvantages, the Australian cadastral survey system has been reasonably successful.

Reasons are:

(i) Evolutionary Development of the system has tended to satisfy needs as they arose.

(ii) Durable Marking: The durability of hardwood pegs and posts has given the system a solid basis.

(iii) Frequency of Resurveys. Frequent resurveys have been executed as a result of changes in land use, changes of ownership, subdivisions and identification surveys.

Environmental factors which have shaped Australian cadastral survey practice are:-

(a) History and nature of land settlement.

(b) Australia's isolation from technological developments overseas.

(c) Lack of foresight and finance in establishing a control network.

GENERAL REFERENCES:

12, 16, 31, 41, 70, 77, 82, 92, 213, 219.

CHAPTER 15

WORKING FEATURES OF A CADASTRAL SURVEY SYSTEM

A cadastral survey system must have the following essential requirements:-

- (i) A clear statement of permissible accuracy.
- (ii) A law of boundary evidence.
- (iii) A system of ground marking.
- (iv) A system of recording survey data.

The following features are advantageous and should be transplanted in a developing country:-

- (a) A definition of position and/or relative accuracy in mathematical terms, independent of methods and equipment.
- (b) A simple, precise and well-ordered law of evidence - preferably based on the pre-eminence of state controlled permanent marks.
- (c) An integrated system of corner, boundary, reference and witness marks suited to the physical and social environment.
- (d) A system of recording survey data based on modern business and management principles.(e.g. Mirror and Curtain Principles.)

- (e) A system of state guarantee of surveys based on the Insurance Principle.
- (f) The integration of the cadastral system with other survey operations.
- (g) The administration of the whole system according to modern management principles.
- (h) The achievement of accuracy standards in the field by the use of modern theory of error and the calculus of observations.⁽¹⁾

(1) Ref. 14 and 15.

CHAPTER 16

NEW GUINEA CADASTRAL SURVEY CONCEPTS

1. AUTHORISED SURVEYS

.1 TECHNICAL CONCEPTS AND PRACTICES.

(i) Equipment

Theodolite and band are required ⁽¹⁾ in all cadastral surveys except traverse surveys of features.

The optical wedge attachment has been used by some surveyors when traversing across ravines. Its use is not permitted under the Regulations but it is tolerated.

The regulation regarding temperature correction to readings of steel bands is inappropriate. Regulation 11 requires the temperature of the band to be noted at each measurement. The variation in temperature through the working day is small, therefore there is no need for temperature readings at each measurement. In addition, as the daily temperature is commonly about 10° - 15° above the standard temperature of the band, it is not uncommon for surveyors to disregard temperature correction altogether.

(1) Reg. 10 and 11, Ref.194

(ii) Methods

Traversing is required almost exclusively.⁽¹⁾
The reasons are similar to those given in Ch.14, Para. 2.2. In particular, traversing suits both highlands and lowlands. Vegetative cover makes resection and intersection difficult, particularly on the lowlands.

(iii) Monumentation

(a) Corner Marking and Boundary Marking

Boundary marking with blazed trees is required⁽²⁾ but is seldom practised.

Ten chain interval pegs (with a maximum of 16 chains if pegs are inter-visible) are required,⁽³⁾ but this can cause confusion to natives (Ch.6, Para. 4.2(iii) (f)).

Cement pegs are used at corners.⁽⁴⁾ From June, 1964, the numbers of Portions have been painted or chiselled on the cement pegs.⁽⁵⁾

(1) Reg. 10 and 11 - ibid

(2) Reg. 37 ibid

(3) Reg. 39 ibid

(4) Reg. 40, Ref. 194

(5) Minutes of D.L.S.M. Surveyor's Conference
Rabaul, 9/6/64.

(b) Reference Marks

Because of the stability of cement corner pegs, reference marks are not required. Some surveyors continue the Australian practice of placing galvanised iron pipes where appropriate.

Witness shield trees are required at each corner (1) but the regulation is seldom adhered to.

Two witness marks (iron spikes or bottles) are to be used at each corner of a "Rural Survey".⁽²⁾ This is to facilitate corner relocation without resurvey. This is a particularly important provision as the low accuracy of "Rural Surveys" may make corner relocation by resurvey uncertain.

(c) Nature of Marks.

Cement pegs appear to be the most satisfactory marks for tropical conditions.

Shields and blazes on trees only last 1-2 years. They are not insisted upon by the Surveyor-General except in the case of Land Settlement Schemes where the settler needs to know where his boundaries are before they are overgrown.⁽³⁾

(1) Regs. 38 and 42, Ref. 194.

(2) Reg. 116, Ref. 194.

(3) Survey Division Circular 1/1964.

(iv) Datum of Surveys

Authorised surveys can be regarded as a system of correlated surveys. Surveys are isolated except that all surveys are executed on the Standard Meridians of the respective Fournil cadastral maps.⁽¹⁾ This frequently necessitates an astronomical determination of azimuth.

The isolated nature of the surveys is further reduced by Regs. 54 and 153, which require isolated Portions less than two miles apart and Portions on opposite banks of a river to be connected.

(v) Horizontal Control

A first order control network for mapping has been established over the whole Territory.

Some second order control has been executed in the Eastern and Western Highlands and the Gazelle Peninsula. However, there is no rigorous programme to extend control such that it will be available for cadastral surveys.

Permanent marks, similar to Australian Survey Co-ordination marks, are required in Urban surveys.⁽²⁾

(1) Regs. 24, 84, 126. Ref. 194

(2) Reg. 58, Ref. 194.

A plane co-ordinate system is not available for these marks.⁽¹⁾

A rough draft of a Survey Co-ordination Ordinance based on the Queensland Survey Co-ordination Act was presented to the 1963 Department of Lands, Survey and Mines Surveyors' Conference. Approval was given in principle by the Administrator in December, 1963.⁽²⁾ By June, 1965 the Bill had been deferred "as it was not considered particularly urgent"⁽³⁾.

Opposition to the Bill has come from:-

- (a) the Legislative Draftsman, who felt that the Ordinance would merely regulate survey activities of Administration Departments inter se. Commonwealth Departments could not be included. He considered a detailed direction from the Administrator would probably be sufficient.⁽⁴⁾
- (1) A system of plane co-ordinates for the Territory has been suggested - Mins. of D.L.S.M. Surveyors Conference 5-7 Aug. 1963.
- (2) D.L.S.M. (Kone) Survey Co-ordination File 140/46
- (3) Minutes of D.L.S.M. Surveyors' Conference (Kone) 21st-22nd June, 1965.
- (4) 23/4/64 Leg. Draftsman to Director D.L.S.M. D.L.S.M. (Kone) Survey Co-ordination File 140/46

(b) The Division of National Mapping and the Department of the Army, who considered the Surveyor-General was presently able to fulfil the functions in the Ordinance.⁽¹⁾

(vi) Accuracy

(a) Numerical Cadastre

The Australian type of numerical cadastre has been adopted for reasons similar to those given in Ch.14, Para. 2.6(i).

(b) Accuracy Specifications

The two specifications of relative accuracy assume a theodolite-band technology:-

(1) Standard Surveys(Reg.13)

1 in 8,000 slopes 0° - 15°

1 in 4,000 slopes exceeding 15° .

(2) Rural Surveys (Reg.114)

1 in 500

"Rural surveys" need to "be rigidly controlled by first order triangulation network or traverse."(Reg.115)
However, no specification of the position accuracy of control points or corner marks is given.

(1) D.L.S.M.(Kone) Survey Co-ordination File 140/46.

(vii) Computation

(a) Area Computation

Double longitude method (Reg.106, S.D.)

(b) Adjustment of Measured Data

The adjustment of measured angles and distances is required (Regs.98(b), 155,S.D.) however, the method of adjustment is not prescribed.

.3 ADMINISTRATIVE CONCEPTS AND PRACTICES

(i) Examination and Oversight of Surveys

(a) Maintenance of Standard of Accuracy.

Tests of accuracy are:-

- (1) "Permissible error of closure"
(Regs. 13, 105 S.D.)
- (2) Permissible angular error of closure
(Reg. 99, S.D.)
- (3) Astronomic check in long traverses
(Reg. 89,S.D.)

(b) Survey Investigation and Examination

All authorised surveys (including those of freehold titles) are examined at the Department of Lands, Surveys and Mines. Examination is very thorough. Field books, working plans, computations as well as the final plan are submitted for examination.(Regs. 104, 110, S.D.). However, there is still a high

degree of personal responsibility placed on the surveyor to execute the survey according to the Regulations.

(ii) Land Management.

(a) Records of Cadastral Survey Data

The survey plans kept by the Registrar of Titles are numerically insignificant as yet.⁽¹⁾ Survey plans of all Administration and Crown lands are kept in the Survey Plan Register of the Department of Lands, Surveys and Mines.⁽²⁾

(b) Statutory Regulation of Survey Practice

All authorised surveys are regulated by the "Rules and Directions for the Guidance of Surveyors".

(c) Cadastral Units

"Frame" cadastral units are used:-

Fourmil Series: (1° latitude x $1\frac{1}{2}^{\circ}$ longitude)
covers the whole of the Territory.

Milinch Series: (20' latitude x 30' longitude)
only available in areas of
extensive rural development.

Hamil Series: Usually contains a town- it may
cut across Milinch boundaries.

Quarmil Series: Usually a town and environs.

(1) 47 Deposited Plans at 1/66 .

(2) 5,193 plans registered at 12/65.

The boundaries of these map sheets diverge from true rectangularity to follow natural boundaries and Portion boundaries where appropriate.

(d) Cadastral - Topographic Mapping

Large scale plans have frequently served both cadastral and topographic purposes.

Before World War II in the Territory of New Guinea, District Maps were available on metrical scales varying from 1/100,000 to 1/500,000. In Papua, a series of manuscript sheets covered the Territory on a scale of 4 miles to 1 inch. Another Series (known as District Maps) was designed to cover the Territory on a scale of 40 chains to 1 inch. These series were basically cadastral; but topographical detail was included where it had been surveyed.⁽¹⁾

By 1957, a new "frame" series (described in(c)) had been established for the whole Territory. Topographic detail was to be added to these maps as aerial mapping proceeded.⁽²⁾ The series is still basically cadastral. Topographical detail is provided by maps of smaller scale.

(1) Reilly, S.E. "Surveying and Mapping in Papua and New Guinea". Aust. Surveyor, Vol. 13, No.3 Sept. 1950.

(2) A.R.(N.G.) 1957 - 1958, p.44.

(e) Centralisation of Administration

Since the late 1950's, the Department of Lands, Surveys and Mines has been decentralised into three regions: Papua, New Guinea Mainland and New Guinea Islands.

The Titles Registry is centralised at Port Moresby.

(iii) System of Recording Survey Data

The Australian pattern has been followed. This is inevitable as large scale maps are not available for the noting of mutations and resurveys.

.4 LEGAL CONCEPTS.

(i) Types of Admissible Evidence

Oral evidence is used more frequently than in Australia. It is applied particularly in the re-establishment of boundaries for the restoration of lost titles in New Guinea, and of old Deeds of Attestation, or Deeds in the Index of Unregistered Administration Land.

(ii) The Law of Evidence

Australian legal principles are applied.

Case law on boundary definition is almost non-existent.

.5 WORK ORGANISATION

(i) Division and Specialisation of Labour

The use of technicians has been more wide-spread in New Guinea than in Australia (Ch.8, Para. 1.5, Para. 8.1)

(ii) Responsibility for Work

A system of state registration of surveyors has always operated (Ch. 8, Para.3.2).

2. UNAUTHORISED SURVEYS.

.1 INTRODUCTION

These concepts and practices have been discussed in Chapter 6, Para. 3.3, 4.4; Chapter 7, Para. 1,2,3; and Chapter 8, Para 3, 6.2, They are itemised here as a summary.

(i) Equipment

Compass and band.

In 1962-63, the Land Titles Commission purchased a Tellurometer. It has been seldom used because it was inappropriate for the type of survey work, and the Land Titles Commission had no qualified surveyor to supervise its operation.

(ii) Methods : Traversing.

(iii) Monumentation.

No marks have statutory recognition. Marks placed by authorised surveyors take preference (Ch.6, Para.4.1).

(a) Corner and Boundary Marking.

Boundary lines are usually cut.

Corner marks are usually hardwood posts or steel star pickets.

(b) Reference and Witness Marks.

Shield trees are used in some Land Settlement subdivisions and native land purchase surveys.

(c) Nature of Marks.

Steel pickets are quite durable but are not easily visible in tropical undergrowth.

New Guinean hardwood is really only hard soft-wood and is not sufficiently durable.

(iv) Datum of Surveys.

Datum points are often inadequate (Ch.6, Para. 3.3(vi)).

An isolated system of surveys pervades, although some unauthorised surveys are connected to nearby authorised surveys.

"The quality of their (Government Officers) contribution to cadastral surveying was uneven, and maps accompanying patrol reports were sometimes almost useless, since their scale and orientation were so dubious that it was impossible to fit them to maps prepared by skilled people, such as qualified Government Surveyors and members of the military survey corps".⁽¹⁾

- (1) Reilly, S. E. "Surveying and Mapping in Papua and New Guinea. Aust. Surveyor Vol. 13, No.3 Sept. 1950. p.130.

(v) Accuracy

(a) Area Computation

By planimeter.

(b) Adjustment of Measured Data.

Adjustment by the Bowditch method is sometimes practised.

.3 ADMINISTRATIVE CONCEPTS AND PRACTICES.

(i) Examination and Oversight of Surveys

(a) Maintenance of a Standard of Accuracy

The plotted traverse is the only check on the accuracy of survey (Department of Forest's practice excepted).

(b) Survey Examination

Degree of examination varies. For example, plans of Deeds of Attestation were examined in more detail than Deeds in the Index of Unregistered Administration Land.

(c) Supervision of Survey.

No supervision by qualified surveyors.

(ii) Land Management

(a) Records of Cadastral Data

Plans and field books are filed in the following Government Agencies:- Department of Lands, Surveys and Mines, Department of Forests, Land Titles Commission,

Department of Agriculture, Stock and Fisheries.

(b) Regulation of Survey Practice.

There is no statutory regulation and Departmental Manuals are not necessarily adhered to.

(iii) Systems of Recording Survey Data

The plan recording system varies from agency to agency. For example, in the Department of Lands, Surveys and Mines there is a Register of Miscellaneous Plans; in the Land Titles Commission, plans are often filed with the findings of the Commissioner.

.4 LEGAL CONCEPTS

Surveys are not necessarily based on Australian legal principles of boundary definition.

.5 WORK ORGANISATION

(i) Division and Specialisation of Labour.

Field teams normally comprise 1 field officer, 2-3 permanent labourers, 6-7 casual labourers.

(ii) Responsibility for Work

No person or agency accepts the responsibility for work.

3. CONCLUSION

.1 Concepts and practices associated with authorised surveys in Papua and New Guinea are almost identical to the Australian cadastral survey practice. Similarities

include: the technology of theodolite-band, Survey Co-ordination concepts, tests for accuracy of survey, centralisation and decentralisation of the Titles Registry and Department of Lands, Surveys and Mines respectively, professional concepts and the state registration of surveyors.

Dissimilarities indicate some improvements on Australian practice. A more serious attempt has been made to correlate surveys. "Frame" cadastral units have been adopted.

In some cases the New Guinea Regulations show adaptation to the New Guinea environment, e.g. use of cement pegs. In other cases, Regulations are so inappropriate that they are overlooked, e.g. temperature reading at every band measurement; shields and blazes on trees.

.2 The concepts and practices associated with unauthorised surveys are the result of an attempt by unqualified surveyors to cope with pressing survey needs in the Territory.

.3 There is a striking disparity between the systems of "authorised" and "unauthorised" surveys. Dissimilarities include: standards of survey, standard of plan, statutory control of surveys, demarcation, training and qualification of surveyors.

Thus, whilst some cadastral surveys are prepared meticulously to Australian standards, many others are so inadequate that insecurity of title is inevitable.

GENERAL REFERENCES

CHAPTER 17FUTURE CADASTRAL SURVEY CONCEPTS : A MODEL.1. THE THEORY OF BOUNDARIES (Using Set Theory)

Consider a parcel of land as an infinite point set.

Assume that the point set of an adjoining parcel overlaps the point set of the parcel in question. That is, there is a gradual fading of one point set with a commensurate increase in intensity of the contiguous point set.

The boundary between the two point sets is an infinite line set in the area of overlap. In the case of "general boundaries", the infinite line set is a line of trees, hedge, ditch, fence, bank of a waterway, edge of ridge etc. In the case of "specific boundaries", the infinite line set is so reduced in width that for practical purposes the set becomes one line. This is done by means of a small point mark on a monument at each corner.

Where boundary features exist, the relative accuracy of defining a boundary between two parcels by survey, depends on:-

- (i) the accuracy in defining the most representative line of the infinite line set,
- (ii) the relative accuracy of the measuring process

Where boundary features do not exist, the relative accuracy of defining a boundary depends only on:-

- (a) the relative accuracy of the measuring process,
- (b) the accuracy of placing a "specific" mark in accordance with measurements.

2. GENERAL OR SPECIFIC BOUNDARIES FOR PAPUA AND NEW GUINEA?

.1 GENERAL BOUNDARIES

Advantages.

- (i) From the landowner's point of view, the best boundary is the one which is clearly visible on the ground and cannot easily be moved.
- (ii) If the visible boundary features are the boundaries in law (and not merely in fact), then the services of a surveyor for parcel identification are not needed.
- (iii) General boundaries are common in traditional society. Topographical features have commonly been used as clan and tribal boundaries.

Vegetation has commonly been used for individual and lineage garden plots (Refer Appendix 7).

Disadvantages.

- (a) The true position of the boundary always remains vague.

.2 SPECIFIC BOUNDARIESAdvantages

- (i) For all practical purposes the boundary is one line. Boundary encroachments can be indisputably resolved.
- (ii) The accuracy of defining the boundary depends on the accuracy of measurement only.

Disadvantages

- (a) Although the boundary may be marked intermittently (e.g. every 10 chains), an identification survey is necessary to determine encroachments.

.3 COMMENTS

It follows that "general" boundaries are preferable for native lands.

However, the problems of implementation are:-

- (i) The boundaries of rationalised tenure blocks are initially "specific". They are set out by survey and marked only at corners.
- (ii) The boundaries of formalised tenure parcels are poorly featured or featured so irregularly as to be unsuitable for registration. Therefore, in general, boundaries must be initially defined "specifically"

by means of corner marks.

(iii) The case study in Appendix 7 indicates that natives are not particularly interested in maintaining physical boundary features except where cultivation abuts the boundary.

(iv) The planting of all boundaries would require considerable supervision.

Nevertheless, where possible, the planting of boundaries should be encouraged and supervised by staff of the local Registry. A long term objective must be the provision of sufficient indigenous staff at local Registries to enable the planting of boundaries to be common practice.

3. A LAW OF EVIDENCE

Some legal weight must be given to the physically "featured" boundaries. On the other hand, the superiority of the corner monuments cannot be dismissed. Both specific and general boundaries are evidence of the true boundary but differ in their accuracy of spatial position. A law of evidence must, therefore, contain the following broad principles.

(i) The specific boundary defined by the original corner monuments (or witness monuments thereto) is the most accurate determination of the boundary.

(ii) The physical boundary is evidence of the general line of boundary (line set) provided the accuracy of the position of boundary features has been quoted by a registered surveyor or assistant on the plan (i.e. standard deviation of the line set must be quoted.)

(iii) Where original corner monuments have been lost, a boundary may be redefined by:-

- (a) survey from nearby monuments
- (b) the physical boundary

The most accurate redefinition would have the greatest weight as evidence of the original position of the boundary.

4. ACCURACY STANDARDS FOR BOUNDARIES

.1 ABSOLUTE OR RELATIVE TOLERANCE IN BOUNDARY POSITION?

A boundary may be relocated such that:-

- (i) It lies within a given tolerance interval of the original boundary position. The tolerance interval is best quoted as a standard deviation of the line set representing the boundary.
- and/or (ii) It's tolerance in position is related to the distance surveyed from found monuments and boundary evidence. In such cases tolerance is proportional to the distance (e.g. as in Australia), the

distance squared, etc.

If (i) only is required, the accuracy of measurements over short boundaries may be inadequate.

If (ii) only is required, the boundary position established from distant marks may not adequately represent the original position.

It follows that the ideal specification will include both types of tolerances. However, specification of type (i) is only possible if an adequate density of conservation marks are established (reference, witness and low order control stations).

.2 DETERMINANTS OF TOLERANCE

- (i) Land use,
- (ii) Land value,
- (iii) Uses to which the cadastral survey will be put.

These fall under two main headings:-

- (a) Description. The cadastral survey may describe the parcel in technical terms for parcel identification, legal, fiscal and mapping purposes.
- (b) Redefinition. The survey may enable boundaries to be relocated when ground evidence is absent.

Land value cannot be used as a determinant, because the value of rural land in the Territory is universally low. The average unimproved value of land for formal land settlement was \$5.1 per acre in

1965/66 (Ch. 4, Part 4). The improved capital value after a land settlement scheme is underway is only about twice the unimproved capital value.

At present, the usefulness of cadastral surveys depends on the form of registration (i.e. under the R.P.O. and L.R.O. or the L.R. (C.O.L.)O.). This in turn depends on the tenure of the land (rationalised or formalised). It is assumed that if a national cadastre is pursued, the maximum use will be placed on all cadastral data regardless of the tenure of the land.

Therefore tolerance specifications must be determined from an analysis of the accuracy required for the redefinition of boundaries according to the land use.

It has been argued that land use is a poor criteria upon which to determine survey accuracy as future land use is unpredictable in a developing country. Admittedly it is wise for the accuracy of control surveys to err on the side of conservatism. The duplication of control surveys (even of the fourth order) must be avoided.⁽¹⁾ However, the "fill in"

(1) Ch.1, Ref. 164.

survey from the control survey marks to the boundary marks should be performed only to such accuracy standards that satisfy foreseeable land use requirements.

.3 ABSOLUTE TOLERANCES FOR AGRICULTURAL LAND.

It will suffice to give two examples of the type of approach necessary in determining tolerance specifications - perennial and annual cropping.

The conclusions drawn are offered as a model for further evaluation and pilot experiment and not as firm proposals.

(i) Criteria

The pattern of planting, especially tree crops, has been used in other countries as a basis for determining boundary accuracy.⁽¹⁾

However, cases occur in Papua and New Guinea where plantings are not parallel to the boundary, e.g. rubber plantings along contours.

Therefore the criteria must be:-

In the case of a redetermination of the boundary, plantings must not be relocated in the adjoining parcel.

The proximity of plantings to the boundary depends on the native farmer and the Department of Agriculture, Stock and Fisheries planting policy in the area.

(1) p.85-86 Ref.57

(ii) Model Absolute Specifications for Agricultural Land.

(a) Perennial Crops.

Plantings on formal land settlement blocks have been found to be seldom closer than .5 meter. A standard deviation of about .3 meter would appear suitable.

Such a standard deviation would approximate the standard deviation of a boundary marked with trees.

(b) Annual Crops

Plantings have generally been found to be no closer than 0.3 meters.⁽¹⁾ Therefore, a standard deviation of 0.2 meters could be adopted. This approximates the standard deviation of a fenced boundary.

.4 RELATIVE TOLERANCE FOR RURAL LAND

(i) Criteria (Refer Fig.5)

(a) For short distances, tolerance is best specified as a set quantity independent of distance. This quantity should be such that the rightholder and the public generally regard the measurement as error free.

An initially low proportionate accuracy is permissible. It will rapidly increase to a determined maximum between 20 and 50 meters.

(1) Where members of the same clan or lineage own adjoining blocks, plantings may disregard the boundary (Appendix 7).

(b) From this maximum, the proportionate accuracy can be permitted to gradually fall off to a determined minimum.

(c) From this minimum, the relative tolerance must remain a constant, because the absolute tolerance of boundary positions must be complied with. Consequently the proportionate accuracy increases with distance again.

(ii) Model Relative Specifications for Agricultural Land. (Refer Fig. 5).

(a) 0-20 metres : a tolerance of ± 1 cm.

(b) 20-50 metres : a proportionate accuracy of 1 in 2000.

Thus the relative tolerance at 50 metres is ± 2.5 cm.

(c) 50-200 metres : increase in relative tolerance from ± 2.5 cm. to ± 42 cm. for perennial crop land and ± 2.5 cm. to ± 28 cm. for market gardens.

(d) Above 200 metres : constant relative tolerance of ± 42 cm. for perennial crop lands and ± 28 cm. for market gardens. ⁽¹⁾

(1) Relative tolerance = $\sqrt{2}$ x Absolute tolerance of boundary position.

5. MONUMENTATION OF BOUNDARIES1. STANDARD CODE FOR ALL LANDS

A standard monumentation code must be adopted for all land. Non-statutory marks must be discouraged.

There appears little value in using different survey marks for different accuracies of survey. The practice of replacing Land Purchase Cements with Official Cements in "authorised" surveys appears unnecessary and is wasteful when the Land Purchase Cements are not returned to the Local Department of District Administration Office. A statement of accuracy on the plan of survey should be sufficient. If considered an advantage, accuracy standards could be indicated by simple markings on the cement peg.

2. WITNESS MARKS

Witness marks should be used extensively because:

- (i) they facilitate boundary relocation.
- (ii) A boundary could be more accurately relocated from witness marks at the corners than by a survey from nearby boundaries at the standard of accuracy proposed in Part 4.

(a) Location of Witness MarksSubterranean Witness Marks

Advantages	Disadvantages
<p>1. They suffer less disturbance than surface marks.</p> <p>2. They can be readily located if surface features are noted on the survey plan. Helpful features in New Guinea would be long growing trees (e.g. coconuts), or a cairn of stones.</p>	<p>1. If corner peg has been, a rough resurvey, at least, is necessary in order to find the witness marks.</p>

Surface Witness Marks

Advantages	Disadvantages
1. Marks can frequently be found without resurvey	1. More likely to be disturbed. 2. May be misinterpreted by a native as the corner mark.

The choice of location must depend on the circumstances.

If surface witness marks are used, they should be located on boundary lines to minimise confusion to natives.

The advantage of a subsurface mark directly below a corner mark⁽¹⁾ should not be overlooked.

(b) Nature of Witness Marks.

Where surface witness marks are used, they should be different from the corner mark in shape and, preferably, material, so that native confusion might be minimised.

(1) This is common practice in Western Europe.

6. FIELD METHODS AND EQUIPMENT.1 RECONNAISSANCE AND THE OPTIMISATION OF TECHNIQUE

The calculus of observations and the theory of error have now been so well developed that any survey operation can be planned by quantitative analysis.

The modern cadastral survey system must be scientifically planned in order to optimise the cost benefit ratio and to ensure the maintenance of accuracy standards.

Because the cadastral system in New Guinea is at an early stage of development, the adoption of reconnaissance and optimisation of technique (Ref. to Glossary for definition) is most advisable.

Although the theory and mathematics behind these methods are complicated, the practical application by means of tables and nomograms is simple.⁽¹⁾

The recommendation of particular field survey methods is avoided in this thesis because of the emphasis placed on the need for the selection of methods by scientific planning.

The development of practical reconnaissance and optimisation of technique procedures for New Guinea requires:- (i) mathematical investigation based on the Dutch investigation and the NewGuinean requirements.

(1) Proved by Dutch experience since 1956. Ref.93.

(ii) pilot projects in New Guinea for time-cost analysis of various methods.

The need for assistance from an Australian University with respect to both (i) and (ii) cannot be overemphasised.

Pilot projects in terrestrial methods should include the following instrumentation:-
 conventional theodolites;
 Wild compass theodolite T.O.;
 the double - image distance - measuring wedge (e.g. prism attachment to Wild, Hilger and Watts, and Kern theodolites, Wild R.D.H., Kern D.K.R.T.);
 plane table and alidade - in particular the Ereithaupt Plane Table Tacheometer No. 5040 "Mejun",
 subtense bar;
 electronic distance - measuring equipment.

.2 AERIAL METHODS - A QUALITATIVE STUDY

Due to the increasing interest in aerial methods by both surveyors and administrators, the following qualitative study is included.

Pilot projects are particularly necessary to determine cost and suitability to New Guinea conditions.

Advantages	Disadvantages
<p>1. Numerical photogrammetry is sufficiently well advanced to easily satisfy the accuracy requirements of Part 4 (short distances excepted).</p> <p>2. The photograph is a convenient transitional form of cadastral data storage. Photograph enlargements can be used as cadastral maps until the large-scale plotting and co-ordinate measurements are carried out.</p> <p>3. The control surveys, can be carried out in part, by aerotriangulation.</p>	<p>1. Numerical photogrammetry requires high precision equipment, favourable conditions (plotting and photography), pre-marking, skilled personnel, meticulous planning and supervision of operations.</p> <p>2. The signalisation of large areas is difficult as native disturbance can be expected. If only small areas are flown at a time, the cost is increased.</p> <p>3. All boundaries must be cut to ensure native understanding of boundary positions.</p>

Advantages	Disadvantages
<p>4. The photography has wide use for geo-botanical surveys, land use surveys, land use classification, farm planning, geological surveys, communication planning, design of public works programs, forestry sampling and management.</p>	<p>4. The ground survey of all boundaries is necessary in initial subdivisions (e.g. Land Settlement Schemes).</p> <p>5. Vegetative cover necessitates considerable clearing for every signalled point.</p> <p>6. It is only applicable to the survey of adjudicated and demarcated lands if adjudication and demarcation proceeds area by area (this is presently not the case, Ch.7, Para. 3.4 (iii)).</p>

7. COMPUTATION

.1 CO-ORDINATE COMPUTATION

Reasons for the adoption of co-ordinate computation are:-

- (i) versatility,
- (ii) necessity in the integration of surveys (Part 8).

.2 COMPUTING MACHINES

To maximise work output by field and office staff, the use of Electronic Data Processing is imperative.

It may not be financially possible to initially provide mechanical hand computers to all field staff.

The problem can be overcome by:-

- (i) encouraging and training staff in the Trachtenberg System of Basic Mathematics. This system is simple and could be readily learnt by Standard 6 indigenes.
- (ii) providing staff with abacii. The improved design and operational techniques developed in Japan in recent years have made the abacus a simple, efficient calculator.⁽¹⁾ The abacus is particularly suitable for addition and subtraction. Division is slow and a little complicated.

8. THE INTEGRATION OF SURVEYS

.1 ADVANTAGES OF A RECTANGULAR CO-ORDINATE SYSTEM

- (i) Points can be conveniently described in relation to each other.
- (ii) Any two co-ordinated points will provide an azimuth for a survey.
- (iii) Points can be systematically recorded in tabular form.
- (iv) The plotting of points is facilitated.
- (v) The plane rectangular system makes for ease and

versatility of computation.

(vi) Co-ordinated points can be used for all types of local surveys, e.g. cadastral, engineering, hydrographic, mining. A system of co-ordinated points is essential for a system of integrated surveys.

(vii) The restitution of aerial photographs necessitates the use of rectangular co-ordinates of ground control. Consequently, the general use of a rectangular co-ordinate system facilitates future large scale aerial mapping.

(viii) Co-ordinated points can be used as evidence in boundary relocation.

(ix) Co-ordinates provide a convenient form in which data can be stored in electronic memories. Land and population resources can be readily stored by co-ordinates in a data bank.⁽¹⁾ Areal as well as point data can be located by co-ordinates.⁽²⁾

.2 A NATIONAL PLANE RECTANGULAR CO-ORDINATE SYSTEM.

Notwithstanding the advantages of a plane rectangular co-ordinate system the proliferation of local systems can bring about almost as much confusion as if none had been introduced.

(1) Ref. 217

(2) Ref. 156.

Obviously, a national system based on a suitable map projection is essential. However, the use of a national system depends on the availability of a control network which is sufficiently dense for local survey requirements. It appears that the Administration is not, understandably, prepared to make resources available for the establishment of such a network.

Two alternatives are available:-

- (i) To persist with the present system of correlated surveys.
- (ii) To extend the system of correlated surveys such that when low order control becomes available all surveys can be placed on the national co-ordinate system

Alternative (i) will inevitably lead to a dilemma similar to that in which the Australian States now find themselves. It will also inevitably lead to the adoption of alternative (ii) sometime in the future.

.3 PROPOSED SYSTEM FOR THE INTEGRATION OF SURVEYS IN PAPUA AND NEW GUINEA.

- (i) Principles
 - (a) If well selected, confusion caused by the proliferation of local plane co-ordinated systems can be minimised.
 - (b) A local co-ordinate system can readily be

incorporated into a national system at a later date provided that:-

- (1) the same projection and zonal divisions are used for all local systems;
- (2) scale corrections are made;
- (3) the determination of true north is made;
- (4) convergence of meridian corrections are made;
- (5) $t - T$ corrections are made for long lines;
- (6) sea level corrections are made.

Note that (3) and (4) are already required for "authorised" surveys. (Ch. 16).

(c) The local co-ordinate system may have:-

- (1) its own low order control, or
- (2) no low order control.

In the case of (1), local surveys can be adjusted with respect to the unadjusted values of the low order control points. Small additional adjustments may be necessary when the low order network is adjusted to the national network. This additional adjustment will frequently be negligible if care is taken with the survey of the low order control. Consequently, conversion to the national system would be a correction to each local co-ordinate of the difference between the assumed and true co-ordinates of the origin of the local system.

In the case of (2), two corrections to the local co-ordinates would be necessary:-

- (A) the algebraic correction for the difference between the assumed and true values of the origin of the local system.
- (B) the adjustment of co-ordinates caused by conformality to the low order control.
- (d) Co-ordinates of Origin of the Local Co-ordinate System.

These can be either:-

- (1) "arbitrary"
- (2) "provisional" approximations of true co-ordinates calculated from astronomic determinations.
- (e) Resources; Finance and Manpower.

A proposal for the integration of surveys must require a very minimum of additional resource allocation by the Administration and the private landowner.

The additional costs in calculating the scale, t-T, and sea level corrections would be negligible.

Part of the money allocated to the "authorised" survey of land settlement schemes could be directed to low order control surveys if subdivisional survey standards were lowered and indigenous technicians were trained.

(ii) Proposals

Applying these principles, any survey would fall into one of the following categories:-

- (a) Where the full hierarchy of control has been established: use national co-ordinate system.
- (b) Where the full hierarchy of control has not been established, and the survey covers an extensive area, e.g. large land settlement scheme, urban or mineral land development:-
 - (1) Determine "provisional" co-ordinates of the origin.
 - (2) Establish a low order control network if considered desirable. This will depend on the extent of the area and the anticipated use to which co-ordinated points will be put.
- (c) Where the full hierarchy of control has not been established and the survey covers a small area:-
 - (1) adopt "arbitrary" co-ordinates of origin
 - (2) correct measurements for scale, convergence, t-T and sea level.

(iii) Administration of the System

It will be necessary for Administration officials to oversee the system. Wise planning would avoid unnecessary duplication of local systems and the consolidation of systems when this becomes practical.

(iv) Comments.

Many of the benefits of a plane rectangular co-ordinate system (Para. 8.1) can accrue without the system being tied into a national control network.

These proposals are designed to:-

- (a) make available the advantages of a plane rectangular co-ordinate system for local surveys, as soon as possible.
- (b) correlate local surveys to such an extent that a national system of integrated surveys can be speedily introduced as the full hierarchy of control network becomes available.

The dramatic introduction of a national system of integrated surveys is not economically feasible. Unless a "phased" approach is introduced, the Territory will be deprived of a survey system which would contribute to the efficiency of the country's development.

.4 CHOICE OF A PROJECTION FOR LARGE SCALE MAPPING.Alternatives:-

Universal Transverse Mercator

Lambert Conical Orthomorphic

Oblique Mercator (Meridians lying in the general northwest to southeast direction of the New Guinea Mainland).

The Universal Transverse Mercator is to be preferred for the following reasons:-

(i) The Transverse Mercator projection is the "ideal" surveyor's projection.

Point to point working for long lines on the Lambert Conical Orthomorphic projection is complicated.

(ii) The Universal Transverse Mercator projection is already in use for small scale mapping. If the Lambert Conical Orthomorphic or Oblique Mercator projection were adopted, surveyors, and those of allied professions, would be required to be familiar with two projection systems. In addition, the formulae for the conversion of co-ordinates from the Universal Transverse Mercator to the Lambert Conical Orthomorphic projection, and vice versa, are complex, and calculations are laborious.

(iii) Although the use of the Lambert Conical Orthomorphic projection would require less zones than the Universal Transverse Mercator Projection,⁽¹⁾ the saving would not be great. For example, in the case of 2° zones, the Universal Transverse Mercator projection would require 8 zones; the Lambert Conical Orthomorphic projection

(1) The Territory lies predominantly east-west.

(15° range in longitude, $10\frac{1}{2}^{\circ}$ range in latitude).

would require 6 zones.

Although the use of the Oblique Mercator projection would minimise the number of zones for the Mainland (e.g. 3, 2° zones approximately), the total number required for the whole Territory would afford little saving (e.g. 6, 2° zones).

(iv) The convergence of the meridians at the extremities of zones is less for the Universal Transverse Mercator and Oblique Mercator projections than for the Lambert Conical Orthomorphic projection. (1)

.5 CHOICE OF ZONE WIDTH FOR LARGE SCALE MAPPING

Alternatives:-

<u>Zone Width</u>	<u>Approximate Scale at Zone Extremity</u> (U.T.M., L.C.O. & O.M. Projections)
1½°	$\frac{1}{23,000}$ (2)
2°	$\frac{1}{13,000}$ (2)
3°	$\frac{1}{6,000}$ (2)
6° U.T.M.	$\frac{1}{1,050}$

-
- (1) U.T.M. 2° zone convergence at extremity 25 minutes
 U.T.M. 3° zone convergence at extremity 37.5 minutes
 L.C.O. 3° zone convergence at extremity 75 minutes
- (2) Assuming the scales at the Zone extremity and the Central Meridian (or Parallel for L.C.O.) to be the same magnitude but opposite signs.

The 3° zone is considered most suitable for the following reasons:-

(i) The scale error at the extremities of a 3° zone system is conveniently sized in that it is negligible with respect to the error of plotting and "scaling off" on any normal large scale map. This is an advantage in both military and civil map interpretation.

In contradistinction, the scale error at the extremities of a 6° zone system cannot be conveniently tolerated for very large scale maps.

(ii) The $1\frac{1}{2}^{\circ}$ zone system necessitates twice as many conversion calculations at zone extremities as the 3° zone system. Formulae are complicated and calculation, without an electronic computer, is laborious.

Admittedly, the $1\frac{1}{2}^{\circ}$ zone system enables the scale correction to be disregarded for all normal engineering, mining and cadastral surveys. However, the sea level correction will still need to be determined in many cases. The determination of a combined sea level-scale correction by means of tables involves little extra effort.

(iii) The 3° zone is a multiple of the existing $1\frac{1}{2}^{\circ}$ zones system. (Ch.16, Para 1.3 (ii) (c)). To use a 2° zone would necessitate a re-arrangement of all existing cadastral surveys.

9. MAPS AND PLANS.1 SCALE OF LARGE SCALE MAPS

A maximum scale of 1:10,000 is considered suitable. The scale of 1:15,840 (1 inch to 20 chains), which has been used occasionally ⁽¹⁾, is a little too small for notations to be entered on native agricultural blocks.

.2 THE PLAN RECORDING SYSTEM

Overseas experience indicates that the practical application of the mirror and curtain principles to the recording of cartographic data (Refer Ch.14, Part 3.3) has been difficult to achieve in the past. The practice of noting subsequent mutations on the base plan with inks of different colours has been reasonably satisfactory. ⁽²⁾

(2). However, this suffers from three main disadvantages:-

- (i) The various colours are confusing to the novice or ephemeral searcher.
- (ii) Coloured reproductions of the base plan are expensive.
- (iii) The base plans become congested, even where they are redrawn as regularly as possible.

Modern plan reproduction methods now make way for a proposed alternative. Cheap transparent copies of the base plan can be produced on plastic foil. A blank space

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- (1) e.g. the plan of the Sangara-Popondetta Land Settlement Area.
 - (2) Ref. 57 Page 89.

can be left where the surveyor wishes to add to or amend the plan. The surveyor redraws this area in accordance with his resurvey, his signature and date of survey appearing in a schedule at the side. The transparency is resubmitted to the Registry for examination and lodgement as the "living" base plan. Previous base plans are microfilmed for permanent record.

10. WORK ORGANISATION

Whatever the survey method, operations must be "phased" so as to ensure efficiency. In addition, survey operations must be sufficiently flexible to accommodate administrative delays in adjudication and demarcation.

The pattern of work organisation depends primarily on the supply and academic standards of manpower. The work organisation must be flexible and adapt to changing quantity and quality of manpower.

.1 DIVISION AND SPECIALISATION OF LABOUR

(Terrestrial Methods only)

(i) Technologists (Refer Glossary for definition)

Because of the scarcity of diplomats, or equivalent, they must be used primarily in -

- (a) the overall administration of the Surveying Authority, (e.g. selection and procurement of plant and equipment, the issue of survey instructions to field staff),

- (b) the oversight of surveys (5-6 technicians overseen by 1 technologist),
- (c) the planning of survey operations according to the principle of the optimisation of techniques,
- (d) the calculation (with technicians) of the accuracies achieved to ensure compliance with specifications.

(ii) Technicians (Refer Glossary for definition)

The technician is basically a field supervisor whose primary functions are:-

- (a) project manager under the oversight of a technologist,
- (b) supervision of field parties,
- (c) the assignment of technicians to tasks commensurate with their standard of training,
- (d) supervision of calculations by technicians and office staff.

The number of field parties under the technician's supervision depends on the nature and extent of the survey but would be expected to be approximately five.

(iii) Technicians

Primary functions:-

- (a) leader of field party,
- (b) instrument operator,
- (c) recorder of observed data.

(iv) Skilled labour

One to two skilled labourers are required for each technician. These may frequently be technicians in training.

(v) Unskilled labour

The number of unskilled labourers in a field party depends on the vegetative cover and the nature of the survey.

.2 RESPONSIBILITY FOR WORK

A system of state registration is necessary because:-

- (i) it can be assumed that the Administration will not directly execute all cadastral surveys in the Territory. Private surveyors will continue to operate.
- (ii) in the program of phased survey integration recommended in Part 8, personal liability for work is still necessary.

In the light of the division and specialisation of labour proposed, the most suitable state registration system would be where both technologists and technicians are registered.

The technologist would have personal liability for the standard of the survey. It would be his prerogative to select the method of survey and it must be his responsibility to ensure that accuracy specifications are satisfied.

The technician would have personal liability for the standard of demarcation. This would alleviate the necessity of field supervision by the technologist unless difficulties arise. This is particularly important because the nature of transport facilities in New Guinea often makes inspection trips expensive and time consuming.

State registration is best administered by an independent Board. Secretarial facilities for the Board would best be made available through the Surveying and Mapping Authority.

Graduation from the Institute of Higher Technical Education or a Technical College should be sufficient for registration with the Board without further requirements. The Australian practice of insisting upon additional practical experience before registration will cause unnecessary delays in the engagement of qualified surveyors.

11. ORGANISATION OF DEPARTMENTAL SURVEYS

.1 CREATION OF AN INDEPENDENT SURVEYING AND MAPPING AUTHORITY.

Advantages

1. All departmental surveys would be under the supervision of qualified surveyors. Supervision by qualified surveyors would no longer be restricted to Administration/Crown land.

2. The most appropriate instruments, methods and personnel could be applied to a particular job.
3. Priorities for survey work could be strictly adhered to.
4. An integrated survey system could be pursued.
5. All survey records could be systematically recorded by one Authority.
6. The inefficiency in those Departments which execute and record "unauthorised" surveys would be eliminated.

Disadvantages

1. Some remote purchases of land from natives may still need to be surveyed by Department of District Administration staff.
2. Cost of establishing the Authority.

.2 THE ORGANISATION OF THE SURVEYING AND MAPPING AUTHORITY.

The Organisational Chart (Fig.2) is offered as a long term organisational objective for the Authority. Organisational flexibility is important. Modifications to this proposal can be expected due to changes in the availability of personnel at various training levels and changing survey needs.

- (i) Functions of the Directorate
 - (a) To set standard specifications for all surveys.

- (b) To carry out and/or supervise research for the Authority.
- (c) To issue and keep up-to-date a Handbook on Survey Operations. This must include nomograms, graphs and tables to enable the rapid calculation of the accuracy of a survey (similar to Ref. 15).
- (d) To supervise the overall operations of the Authority.
- (ii) Functions of the Board of Surveyors
 - (a) To register surveyors.
 - (b) To set educational standards which are to be followed by the Institute of Higher Technical Education and the Technical Colleges.
- (iii) Members of the Directorate.

Status: Applied Scientists

Functions:

- (a) Head of a Division of the Authority.
- (b) Concerned primarily with the overall technical and organisational operation of his Division.
- (c) Carry out research, in conjunction with the Research Division, in connection with needs of his Division.

Each member of the Directorate must be a specialist in the field of his Division. Specialist fields must

include Photogrammetry, Higher Mathematics and Computer Science, Geodesy and Astronomy, Business and Land Management, Instrumentation (electronic, optical and mechanical), Cartography.

(iv) Assistant Heads of Divisions.

Status: Technologist

Function: The day to day administration of his Division.

12. TRAINING AND EDUCATION OF INDIGENOUS SURVEYORS.

In order to maintain a uniform pattern of tertiary education in the Territory it is important that the pattern recommended by the Currie Report be adhered to as much as possible. However, the nature of survey work has warranted some modifications.

.1 APPLIED SCIENTISTS.

Qualifications: University Degree overseas; Institute of Higher Technical Education Diploma with post-diplomate studies.

Considering the small number of applied scientists required, there is not sufficient reason for the establishment of university level education in Surveying in the Territory.

Scholarships for overseas study would be necessary. One per year would be adequate. There would be less risk involved in post-diplomate scholarships than in university undergraduate scholarships. Until the first

Diplomats of the Institute of Higher Technical Education have graduated, an annual attempt should be made to recruit a 6th Form student to study overseas.

A background training in anthropology, sociology and social psychology is important to ensure that these top level decision makers have a sympathetic appreciation of the effect of their decisions on the culture and the people.

.2 TECHNOLOGISTS

Qualifications: Diploma from Institute of Higher Technical Education or overseas equivalent.

The course should have a practical bias.

An adequate grounding (theoretical and practical) is necessary in statistics, error theory and the calculus of observations.

The importance of a cadre of officers qualified in the scientific planning of technical operations on a mathematical basis cannot be overstressed.

.3 TECHNICISTS:

Qualifications: Certificate from a Technical College.

The course should be biased heavily toward a sound knowledge of field and office techniques.

It should not deal with the theory behind the techniques. Emphasis must be placed on standard routines (in field and office), the use of graphs and nomograms, supervision of field parties and statutory regulations

with respect to demarcation.

.4 TECHNICIANS:

Qualifications: Training by employer or short course ($\frac{1}{2}$ - 1 year) at a Technical College.

The Currie Report recommends a 4 year formal course for tradesmen (the equivalent of "technician" in this thesis).

Such an extensive formal training is not warranted at this level at the moment. Reasons:-

- (i) The academic standard for survey recruitment can only be expected to be standard 6 and Form 1, (Ch.8).
- (ii) An extensive formal course would cover the skills of operation of several types of survey instruments. It would be more economical for employers or the Technical College to train each technician in the operation of a specific instrument and the performance of a specific field routine.
- (iii) If a set of field routines are stereotyped they can be learnt adequately with 3-6 months block training.

The Currie Report suggests that Departmental training is inefficient and diffuses the effort of teaching staff. (1)

(1) P.242, Ref. 223.

However, even a short course at a Technical College may be so general that the specific training required by an employer may be inadequately covered.

The employer may need to train the employee further.

.5 GENERAL:

Note on Fig. 6 the provision for progression from one level to the next. (1)

Training should be full-time where possible. External studies are suitable where short intensive courses are held and local lectures can be arranged. (2)

GENERAL REFERENCE

3, 4, 6, 7, 8, 9, 10, 14, 15, 19, 20, 22, 24, 26, 27, 28, 29, 31, 32, 34, 39, 40, 41, 43, 50, 57, 58, 59, 61, 64, 66, 71, 72, 73, 79, 82, 87, 90, 93, 95, 97, 98, 99, 100, 103, 108, 109, 110, 113, 115, 117, 118, 126, 128, 130, 133, 134, 137, 138, 139, 144, 146, 156, 157, 159, 164, 166, 169, 170, 174, 176, 177, 182, 190, 198, 199, 200, 203, 204, 205, 206, 207, 208, 209, 211, 212, 214, 215, 217, 218, 220, 222.

(1) p.83 ibid

(2) p87 ibid

SECTION 4

CONCLUSION.

CHAPTER 18CONCLUSION1 LAND REGISTRATION AS A PART OF LAND POLICY AND REFORM

Land registration measures have frequently accompanied land policy and reform measures in Papua and New Guinea:-

Land Policy and Reform	Land Registration Measure
<p>1. Prior to World War II: The acquisition of land from the indigenous inhabitants and alienation by freehold or leasehold grant to expatriate interests.</p>	<p>1. Prussian Land Statute, 1872; German Civil Code, 1902; Land Registration Ordinance; Real Property Ordinance;</p>
<p>2. 1950 : The promotion of European land settlement.</p>	<p>2. Real Property Ordinance, Land Registration Ordinance plus Native Land Registration Ordinance, 1952: The determination of native land rights in order to uncover waste and vacant land for expatriate settlement.</p>
<p>3. 1958 to date: The promotion of planned land settlement schemes for expatriates and natives (expatriate schemes ceased in 1962).</p>	<p>3. Real Property Ordinance, Land Registration Ordinance plus Real Property (Registration of Leases) Ordinance, 1962: The bottleneck in the issuing of leases to be alleviated by the registration of leases "subject to survey".</p>

4. Land (Tenure Conversion) Ordinance, 1962: The conversion of customary tenure to freehold tenure.

5. Land Titles Commission Ordinance, 1962: The formalisation of customary tenure by adjudication and demarcation.

6. Sec. 54 Local Government Ordinance, 1964: The recognition of native individual land use rights.

4. Real Property Ordinance, Land Registration Ordinance: Registration subject to conditions relating to fragmentation, block size and multiple ownership.

5. Land Registration (Communally Owned Land) Ordinance, 1962: The registration of customary "owners" only.

6. Sec. 54 Local Government Ordinance, 1964: Registers to be kept by Local Government Councils.

.2 THE APPROPRIATENESS OF LAND REGISTRATION MEASURES.

Prior to World War II, the land registration measures (R.P.O. and L.R.O.) were appropriate in the sense that:-

- (a) they were based on expatriate concepts of tenure,
- (b) they were applied to land which was almost exclusively held by expatriates,
- (c) being Australian in origin, they were suited to the overall administrative framework of government which had been transplanted from Australia.

Since World War II, those land registration measures affecting native held rural land have inadequately facilitated their respective land reform measures.

Inappropriate features can best be classified as follows:-

.1 Many Australian concepts and practices have been transplanted without first disregarding those which were suited only to Australia or were inappropriate to another country.

Examples:

(i) Records of rights and rightholders are kept by various governmental agencies according to various standards and methods as per Australian practice.

(ii) The Native Land Registration Ordinance was a failure partly because it attempted to apply the Australian registration of title system to land held under native customary tenure.

.2 Legislative change has been introduced without sufficient adaptation of foreign technical and administrative procedures to the New Guinean culture, physical environment and stage of development.

Examples:-

- (i) The Real Property Ordinance and Land Registration Ordinance are based on English land law concepts. The feudal doctrine of estates, the distinction between real and personal property in land, the distinction between law and equity are unsuited to cases where customary tenure is rationalised (individualised) by tenure conversion legislation or by formal land settlement procedures.
- (ii) Several machinery features of the Real Property Ordinance and Land Registration Ordinance are not suited to the parochial nature of rural village life. The land registry service is centralised at Port Moresby and there is no provision for verbal conveyancing at the Registry or before notaries.
- (iii) The "Survey Directions" for "authorised surveys" are almost identical to Australian survey practice. They specify a standard of accuracy and a finesse of computation and of plan presentation which is not necessary in the light of the value and use of native held rural land.
- (iv) The Department of Territories' long-term objective of one registration of title system for the whole of the Territory based on Australian tenure concepts, is illusory. At least fifty per cent of the surface area will remain under native land custom in the foreseeable

future.

(v) Several features of the Prussian Registration of Title System (Grundbuch System), which was discarded in the Territory of New Guinea in 1924, are more appropriate to the Territory than are the corresponding features of the Australian Registration of Title System (Torrens system), which was introduced. These include: allodial ownership, verbal conveyancing, the use of licensed notaries, and a decentralised registry service.

(vi) Several advantageous features of the Higaturu Land Registration Scheme have not been incorporated in current legislation. These are: the sovereignty of rationalised land remains with the clan, the simplicity of cadastration, security in the eyes of the people, relatively low cost of operation, a local registry service.

.3 There has been inadequate administrative and technical planning prior to the introduction of land registration measures.

Examples:-

(i) The Land Titles Commission Ordinance has provided for appropriate judicial procedures but it is vague regarding the administrative and technical details of sporadic and systematic adjudication. No mention is made

of pre-hearing inspectors, demarcation officers, counsels for hearings or survey personnel.

(ii) The survey needs of the Native Land Commission and the Land Titles Commission have never been satisfactorily provided for. Although Commissioners have tried to ensure a reasonable degree of competency in survey, many of the surveys are unsuitable as a permanent cadastral record.

(iii) The majority of Land Settlement Schemes have been subdivided twice, once by a Land Settlement Field Officer, and later by an authorised surveyor. Apart from being uneconomical, this has caused serious confusion amongst native settlers as to which corner marks are the correct ones.

(iv) Land tenure conversion procedures have been permitted to gradually evolve. Responsibility for the survey of tenure conversion blocks has been particularly vague.

.4 Insufficient consideration has been given to the functions which can be performed by a universal land register and how to go about universal cadastration in the Territory.

Examples:-

(i) The Register of communally owned land has a particul-

arly limited use as there is no provision for it to be kept up-to-date by registered conveyancing.

(ii) The provision for dual native land registration systems, one controlled by the Administration and one controlled by Local Government Councils is unnecessary, inefficient and will lead to confusion.

(iii) Adjudication and demarcation within Adjudication Areas is not proceeding block by block, area by area. Consequently, progress in the cadastration of native land can be expected to be slow.

3. A MODEL FOR FUTURE NATIVE LAND REGISTRATION

Solutions to the current inappropriate features lie in a land registration system which is based on the following model:-

.1 PRINCIPLES

(i) A simple law of landed property based on allodial ownership and clan sovereignty.

(ii) Two land registration systems should operate+

One for customary tenure (Registration of Rights).

One for "individualised" tenure (proprietary rights) (Registration of Title).

The Register established under the Land Registration (Communally Owned Land) Ordinance must be replaced by:-

(a) a "living" register of rights.

(b) a "living" register of native land custom.

These registers should be supplemented by two

transitional registers:- a Genealogy Register and a Register of Transfers.

(iii) Machinery features for native held rural land must include : a local registry service, verbal conveyancing, licensed notaries, flexibility in forms and registry practice, "presumptive" titles where necessary.

(iv) A law of boundary evidence based on "specific" and "general" boundaries.

(v) The accuracy of the cadastral survey specified in terms of relative and absolute tolerance.

(vi) The extensive use of witness marks.

(vii) The application of the Mirror and Curtain Principles to plan and map recording.

(viii) The scientific planning of all survey operations according to the principle of Optimisation of Technique and the Calculus of Observations.

(ix) A "phased approach" to the integration of surveys.

(x) The division and specialisation of labour in survey operations into six levels: Applied Scientist, Technologist, Technician, skilled labourer, unskilled labourer.

(xi) The state registration of Applied Scientists, Technologists and Technicians. The two former are to be responsible for the fulfilment of accuracy specifications, the later is to be responsible for the fulfilment of

demarcation specifications.

.2 INSTITUTIONAL FRAMEWORK

- (i) A decentralised Registry service using simple procedures.
- (ii) An independent Judicial Commission to determine land disputes and rights (e.g. Land Titles Commission).
- (iii) An independent Land Tenure Authority to ensure the protection of all landed interests and to supervise the rationalisation and formalisation of native land. The Authority would, inter alia, employ pre-hearing inspectors of land rights and customs, counsels for Land Titles Commission hearings, and demarcation officers to assist Demarcation Committees.
- (iv) An independent Surveying and Mapping Authority outside the direct control of the Department of Lands, Surveys and Mines.

APPENDIX 1

PROCEDURAL STEPS IN THE PURCHASE OR LEASE
OF NATIVE LAND BY THE ADMINISTRATION/CROWN.

Prior to the Land Ordinance of 1962

1. Ownership and land potential investigation (by D.D.A., D.L.S.M. or D.A.S.F. staff).
2. Survey
3. Transfer or Lease Instrument drawn up in the field.
4. Documents checked by Drafting Office and Conveyancing Section of Department of Lands, Surveys and Mines Head Office.
5. Documents lodged with the Registrar of Titles for registration. Registrar-General would inspect Deeds of Attestation.

Disadvantage: Instruments were drawn up by persons who were not legally trained.

Under the Land Ordinance of 1962.

1. Investigation of ownership and land potential.
2. Survey.
3. Certificates of Alienability, of Walking of Boundaries, of the Interpreter sent to Department of Lands, Surveys and Mines.

4. Conveyancing Section of the Department of Lands, Surveys and Mines draws up documents; Drafting Section draws plan.
5. Documents sent to a local office for execution.
6. On return, documents are checked at the Department of Lands, Surveys and Mines.
7. Deeds are recorded at the Department of Lands, Surveys and Mines in the Native Land Dealings Register.

APPENDIX 2

PROCEDURAL STEPS⁽¹⁾ IN THE LEASING OF LAND BY THE
CROWN/ADMINISTRATION.

1. Detailed land potential survey and preliminary subdivision.
2. Notification of leasehold in the Government Gazette with details as to use, rentals and improvements (Town leases are tendered).
3. Applications (or tenders) received and date of hearing by Land Board is notified.
4. Public enquiry by Land Board.
5. Recommendations by Land Board placed before the Administrator-in-Council.
6. Gazettal of granted leases.
7. Appeals.
8. Registration by Registrar of Titles "subject to survey".
9. "Authorised" survey (may be executed at Stage 1 but not often.)

(1) Leases may be agricultural, pastoral, business, commercial, residential, mission, etc.

APPENDIX 3

PROCEDURAL STEPS IN THE RESTORATION OF TITLES UNDER
THE NEW GUINEA LAND TITLES RESTORATION ORDINANCE
(AFTER THE LAND TITLES COMMISSION ORDINANCE, 1962)⁽¹⁾

1. Claim lodged with Land Titles Commission.
2. Preliminary investigation and survey by Land Titles Commission staff.
3. Land Titles Commissioner issues a "Provisional Order."
4. Notification of Provisional Order to all concerned, including adjoining owners.
5. Investigation of native claims by Department of District Administration staff and Report to Department of District Administration Head Office.
6. If no counter claims, the Commissioner directs the issue of the Final Order.
7. If there are counter claims, the Public Solicitor represents the counter claimants. The Department of District Administration prepares further information upon request of the Public Solicitor, if counter claimants are natives. A Formal Hearing is held and then the Final Order is issued.

(1) "Some Notes on the Land Functions of the Dept. of District Adm." June, 1965 mimeo D.D.A. and Ref. 179.

8. Appeals to the Supreme Court against the Final Order.
9. Final Order submitted to the Registrar of Titles. Commissioner requests "authorised" survey by Department of Lands, Surveys and Mines.

Proceedings are frequently protracted in time and are costly. In most cases, natives do not have legal rights but some equitable rights may exist.

APPENDIX 4

PROCEDURAL STEPS IN THE DETERMINATION OF SPORADIC
DISPUTES BETWEEN NATIVES BY THE LAND TITLES COMMISSION

1. Submission of "Application" by disputants for a determination by the Land Titles Commission.

2. Preliminary hearing by a Commissioner.

Commissioner specifies the information which is required. This is usually:-

(i) an investigation of current rights and native land custom.

(ii) a survey of boundaries and a map of the area

The Commissioner may choose to do (i) and/or (ii) himself, but most Commissioners now request Department of District Administration assistance.

3. Collection of evidence.

4. Hearing.

5. Determination.

6. Appeals.

7. Determination recorded at the Land Titles Commission.

It is intended to include these determinations in the Adjudication Record.

APPENDIX 5

THE STATUS OF LAND TRANSFERS BETWEEN NATIVES AND THE CROWN/ADMINISTRATION.

The increasing number of challenges which natives are making against the Administration/Crown over title to land has been derisively called the "Claim game"⁽¹⁾

Causes for the poor status of the Administration's/Crown's "root of title" (the registered deed of transfer) have to a large extent been self generated:-

.1 LEGAL STATUS OF DOCUMENTS

(i) Deeds of Attestation (Papua-prior to 1962)

Deeds of Attestation are not guaranteed by the State, but possess a high degree of indefeasibility. The Registrar of Titles has taken more care in investigating these deeds than those recorded in the Index of Unregistered Administration Land.

(ii) Deeds Recorded in the Index of Unregistered Administration Land (New Guinea - prior to 1962)

Deeds have no legal unimpeacability.

Those deeds issued prior to 1942 were destroyed during the Japanese invasion. The Chief Commissioner considers that it is not within his jurisdiction to

(1) Pacific Islands Monthly. Feb.1966. pp53-54.

restore the Index under the New Guinea Land Titles Restoration Ordinance. The Administration may be able to restore the Index under Sec.83 of the Land Ordinance.

(iii) Deeds Recorded in the Native Land Dealings Register. (Papua and New Guinea 1962 to date).

The Native Land Dealings Register is unofficial and has no legal status.

The Crown Solicitor interprets Sec.24, 25, and 82 of the Land Ordinance, 1962 as giving deeds of transfer indefeasibility. However, the Public Solicitor seriously doubts this interpretation.

.2 POOR DELIMITATION OF PARCELS

(i) Poor Boundary Marking

(a) Poor Corner Marks

"In Papua and New Guinea we do not have permanent land survey pegs showing the boundaries of land sold by our ancestors either to the Government or to anyone else"⁽¹⁾

Example: "The Government House Land Dispute" (Native Reserve 69):- Land adjoining and east of the Government House fence was considered by all as Crown land, but the natives presumed that as land beyond the fence

(1) Mr. Lepani Watson. H.A. Debates. Vol. 1, No.5, 17th-24th May, 1965 p.642.

was not used it was theirs. The boundaries could not be relocated. The Administration was obliged to purchase the land again.

(b) Some Boundaries have not been Cut at the Time of Purchase.

Example: Natives contested the redefinition by a Land Settlement officer of the western boundary of "Wigomi" and the southern boundary of "Sigob" (near Angoram, Sepik District) because these boundaries were not cut, traversed and walked at the time of purchase. (1)

(c) Change of Course of Natural Boundaries.

Frequently natural boundaries of purchases are not surveyed (e.g. N.L.D. 340).

(ii) Poor Standard of Survey.

Discussed in Chapters 8 and 16.

.3 INADEQUATE RECORD AND DESCRIPTION OF PARCELS

(i) Record of Field Books.

Field data recorded by Department of District Administration staff is often discarded. The plan is often the only record of the survey.

(1) 12/4/65. Field Officer (Tompson) to A/Senior Inspector D.L.S.M.(Kone) Land Settlement Instructions to Field Officers -- N. G. Mainland. File 65/517.

(ii) Description of Parcels

The plan and the verbal description which accompany the deed are seldom examined in detail. Omissions and ambiguities are inevitable.

.4 THE DETERMINATION OF OWNERS.

Prior to 1962 a Department of District Administration Officer would submit to Head Office a full genealogy and ownership investigation of the native land. Now, only the conclusions of the ownership investigation are submitted for permanent record.

APPENDIX 6

THE LAND FUNCTIONS OF THE DEPARTMENT OF DISTRICT
ADMINISTRATION.

.1 RELATED TO THE LAND ORDINANCE.

1. Supervision and direction of all land purchases and leases from native people and control of alienation (including the purchase of timber rights).
2. Alienability investigations.
3. Population pressure and resettlement questions generally.
4. Extension work in resettlement areas - social and community welfare to settlers.
5. The administration of native reserves.
6. Compulsory acquisitions: protection of native interests.
7. Member of the Land Board.
8. Research and advice to the Land Board.

.2 RELATED TO THE NEW GUINEA LAND TITLES RESTORATION
ORDINANCE.

1. The Chief Justice of Papua and New Guinea ruled in March, 1961 that all persons, native or otherwise, are entitled to receive appropriate notice of Provisional and Final Orders under Sec.34(2) and 45 of the New Guinea Land Titles Restoration Ordinance.

The Director of the Department of District Administration must uncover full information with respect to adjoining native owners and service these appropriate notices.

2. To ascertain if there are any native claims.

3. Investigation of native claims.

.3 RELATED TO THE LAND TITLES COMMISSION ORDINANCE.

.1 Assistance to natives in submitting applications to the Land Titles Commission for the determination of disputes.

2. After a Preliminary Hearing by the Commission, the Director of District Administration is often requested to:-

(i) survey and map boundaries in dispute

(ii) investigate current rights and local native land custom.

3. The Deputy Commissioners appointed by the Land Titles Commissioner under the Land Titles Commission Ordinance, 1965, are primarily Department of District Administration officers (especially D.C.s, D.O.s and A.D.O.s).

Deputy Commissioners make determinations which are in turn ratified by Land Titles Commissioners.

.4 RELATED TO THE LAND (TENURE CONVERSION) ORDINANCE, 1963.

Investigation of ownership; availability of land;

motivation of the people; the extent of native agreement to a tenure conversion scheme.

.5 MISCELLANEOUS

1. Liaison with the Director of the Department of Lands, Surveys and Mines, Crown Solicitor, Public Solicitor and Land Titles Commission in all native land matters.
2. Operation of a Mapping Section for the Department of District Administration. Compilation, storage, distribution, printing, copying of maps on a multiplicity of subjects related to Department of District Administration work.
3. Member of the Land Development Board.

APPENDIX 7

FIELD STUDY OF TRADITIONAL BOUNDARY MARKS WHERE TENURE HAS BEEN RATIONALISED.

.1 LALOKI FORMAL LAND SETTLEMENT SCHEME.

Location: Central District.

Land Use: Subsistence and market gardens.

Number of Blocks Investigated: 21

Informants: In most cases only share farmers or the lessee's employees were interviewed. Some lessees were interviewed at Hanuabada village.

Findings: There appeared to be no traditional marks. The steel corner pickets of the preliminary subdivision were respected by some, whilst the cement pegs of the "authorised" subdivision were respected by others.

The licensed surveyor reported that shortly after the completion of the authorised survey one lessee replaced all cement pegs with coconut trees.

.2 SEROVI AND ISIVINI FORMAL LAND SETTLEMENT SCHEMES.

Location: Northern District, near Popondetta.

Land Use: Perennial crops.

Number of Blocks Investigated: 13

Informants: Lessees of the blocks.

Findings:

- (i) Traditional Boundary marks were only planted

where the land was being cultivated. No living marks were found at the back boundaries of the blocks.

(ii) In most cases, boundary trees were placed in the vicinity (1-20 feet) of the cement pegs of the front boundaries.

(iii) Where adjoining owners were from the same tribal group, one tree was usually planted near the front corner peg (e.g. Por.275-274, Por. 271-270, (Serovi)). Where owners were from different tribal groups they usually planted separate corner trees (e.g. Por. 273-274, Por. 279-280 (Serovi)). However, exceptions were quite common.

(iv) Corner pegs were generally respected and cared for. Only one case of the removal of a corner mark and its replacement with a tree, was noted - Por. 198 (Isivini).

(v) The coconut was used almost exclusively as a boundary tree. One settler from Kokoda preferred tall stakes to trees.

.3 VUNAMAMI COUNCIL LAND SETTLEMENT SCHEME.

Location: Gazelle Peninsula

Land Use: Perennial crops.

Number of Blocks Investigated: 8

Informants: Lessees of the blocks

Findings:

- (i) Lessees frequently planted more than one plant near their front boundary cements, even though most lessees were of the same tribal group.
- (ii) Plantings were not common at angles in front boundaries. Lessees did not appear to be very concerned about the location of their boundary with the road.
- (iii) In one case, trees were planted in a row for approximately half the length of the boundary. Tree spacings ranged from 10 to 30 feet.
- (iv) Boundary plants were generally of the decorative type. Crotons were the most popular. Their coloured leaves made corners easy to find. Economic trees were occasionally used (e.g. kapok, pilaua).

.4 HIGATURU LAND REGISTRATION BLOCKS.

Location: Hohorita, Koipa, Agenhambu Villages.

Land Use: Perennial crops

Number of Blocks Investigated: 18

Informants: Two Councillors, village people and some landholders.

Findings:

- (i) The original corner marks were small

posts placed by the subdividing official.

Councillors encouraged landholders to replace these with bendora (hardwood) posts, or economic trees (preferably coconut, beagle nut, and breadfruit tree).

However, decorative trees, crotons in particular, were common.

(ii) Corners only were planted. Boundary lines between corners were not necessarily considered as straight lines.

(iii) Landholders often planted more than one tree near the corner.

.5 MATUPIT ISLAND VILLAGE PLANTATION.

Location: near Rabaul

Land Use: Perennial crops (coconuts).

Number of Blocks Investigated: 25

Informants: Councillor, some village people and some landholders.

Findings:

(i) Cement marks were widely revered.

(ii) Those boundary trees which were found were planted prior to the planting of cement marks by the Land Titles Commission. The people consider that vegetative marks are no longer necessary.

.6 CONCLUSION

(i) The use and type of vegetative growth as boundary marking must be determined by the landholders.

(ii) Where the people desire vegetative marking, their interest should be used to advantage.

(iii) The most common types of vegetative marks are economic trees and decorative plants. Decorative plants are an advantage in boundary location. Regenerative species such as the croton are particularly advantageous.

An economic tree, which lasts at least a generation, should be used (e.g. beatlenut, okarinut, bread-fruit, mango, kapok, coconut, coffee, wild citrus.).

APPENDIX 8

METHODOLOGY

The research methods employed in the main text were:-

- (i) The analysis of existing written data -- Laws and Regulations, published and research articles, official files and documents.
- (ii) Interviews with Administration officials, surveyors in Australia and New Guinea, and a limited number of native landholders (interpreter used.).
- (iii) The observation of the administrative and technical implementation of legislation and top level policy in the following governmental agencies:-
 - Department of Lands, Surveys & Mines -- Port Moresby, Popondetta, Rabaul.
 - Department of Agriculture, Stock & Fisheries -- Port Moresby, Popondetta.
 - Land Titles Commission -- Port Moresby, Popondetta, Rabaul, Lac.
 - Dept. of Forests -- Port Moresby, Lac.
 - Registrar of Titles -- Port Moresby.
 - Dept. of District Administration -- Sub-District Offices -- Port Moresby, Rabaul.

(iv) Correspondence with agencies in several developing countries in Africa, Asia and the South Pacific regarding land registration and cadastral survey practice. This assisted in the determination of the essential and advantageous features of a cadastral system (Ch.11, 15).

A written questionnaire was not used in conjunction with the study of Australian and New Guinean cadastral concepts and practices because:--

(a) finance for a large scale "opinion survey" was not available.

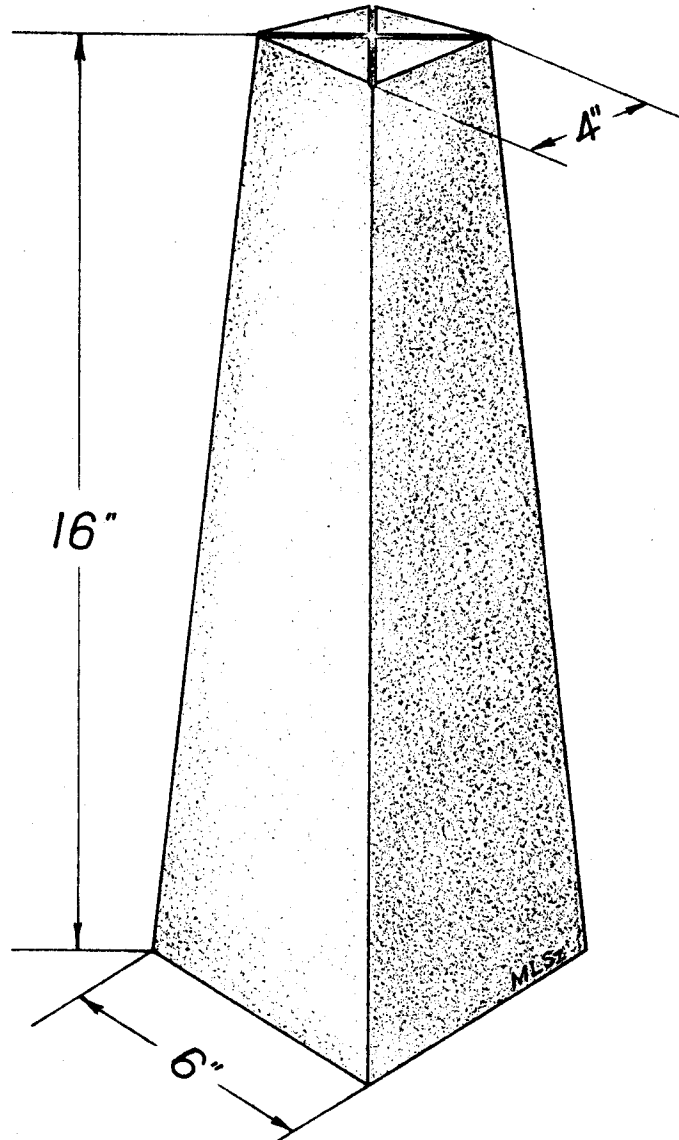
(b) it was feared that response, particularly in New Guinea, would be poor.

APPENDIX 9

COMMON TYPES OF

SURVEY MARKS

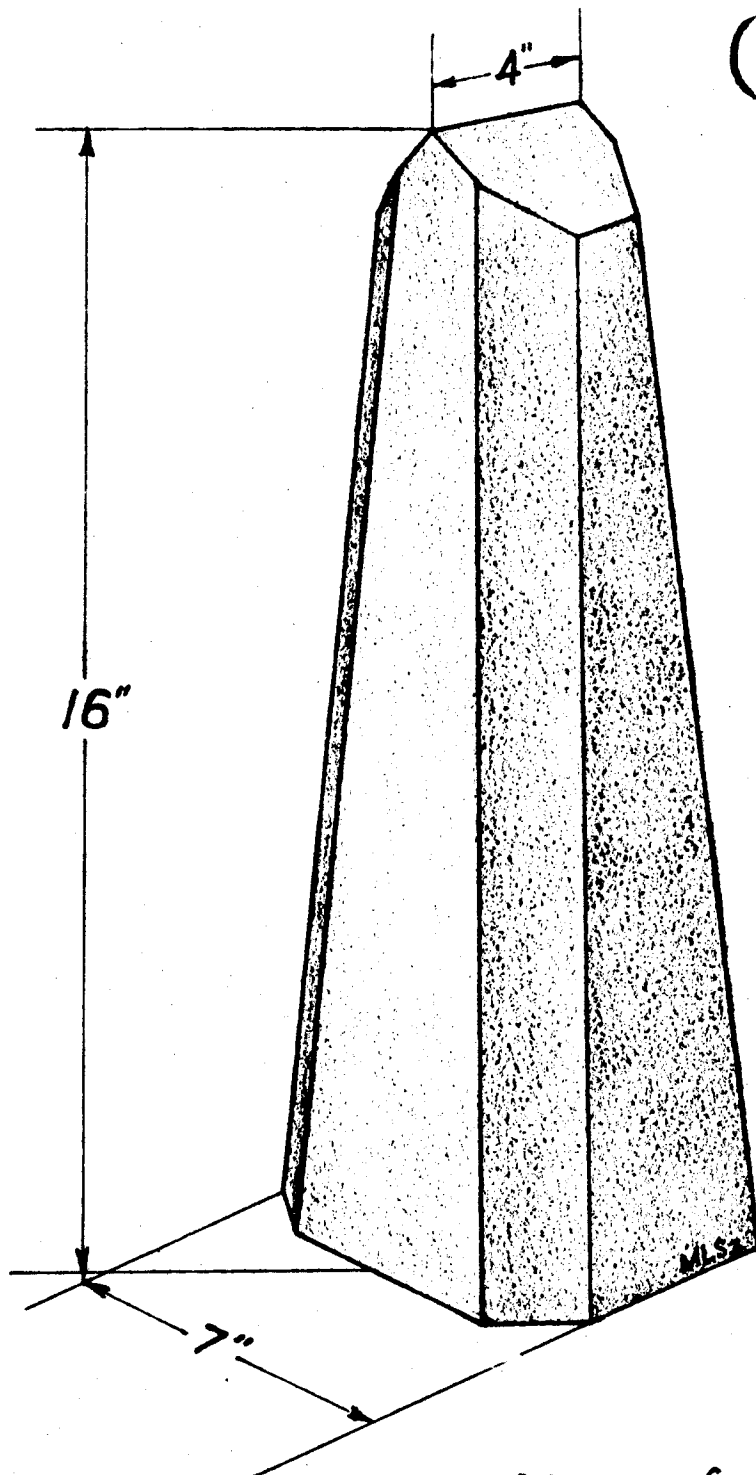
OFFICIAL CEMENT PEG



*Used to mark boundaries of Portions,
Sections and Allotments*

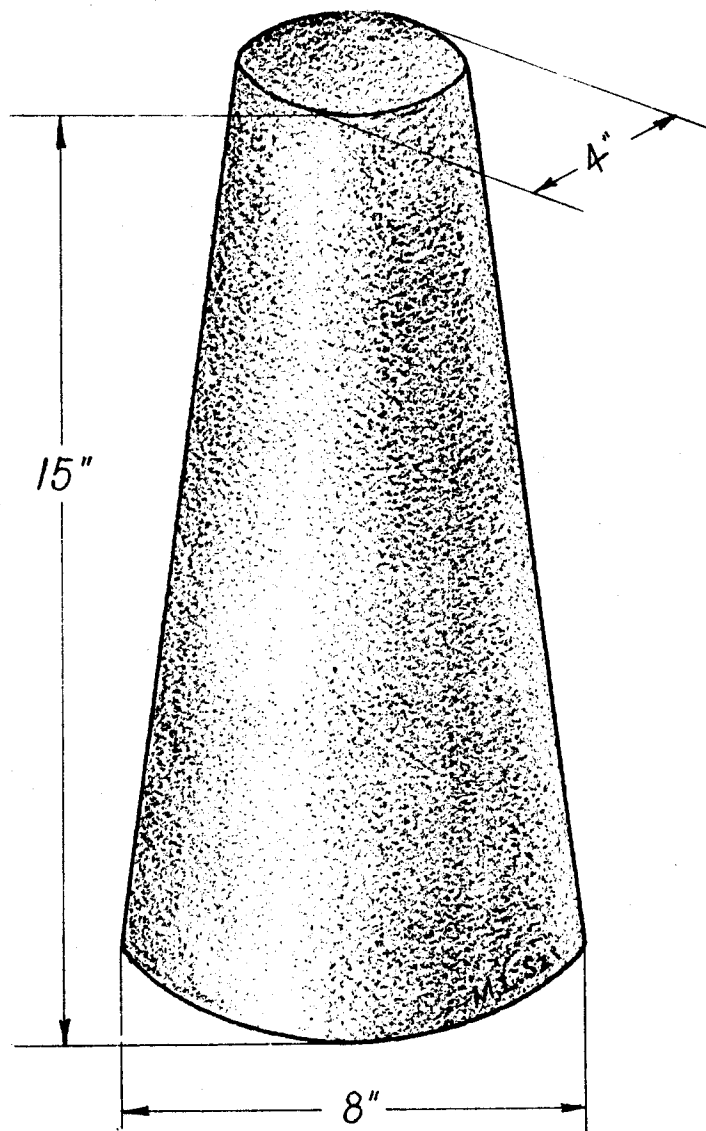
To be placed only by Licensed (Authorised) Surveyors.

LAND PURCHASE CEMENT PEG (L.P.C.)



*To be used for marking of boundaries
of native land being purchased for the
Administration.*

LAND TITLES COMMISSION CEM. PEG

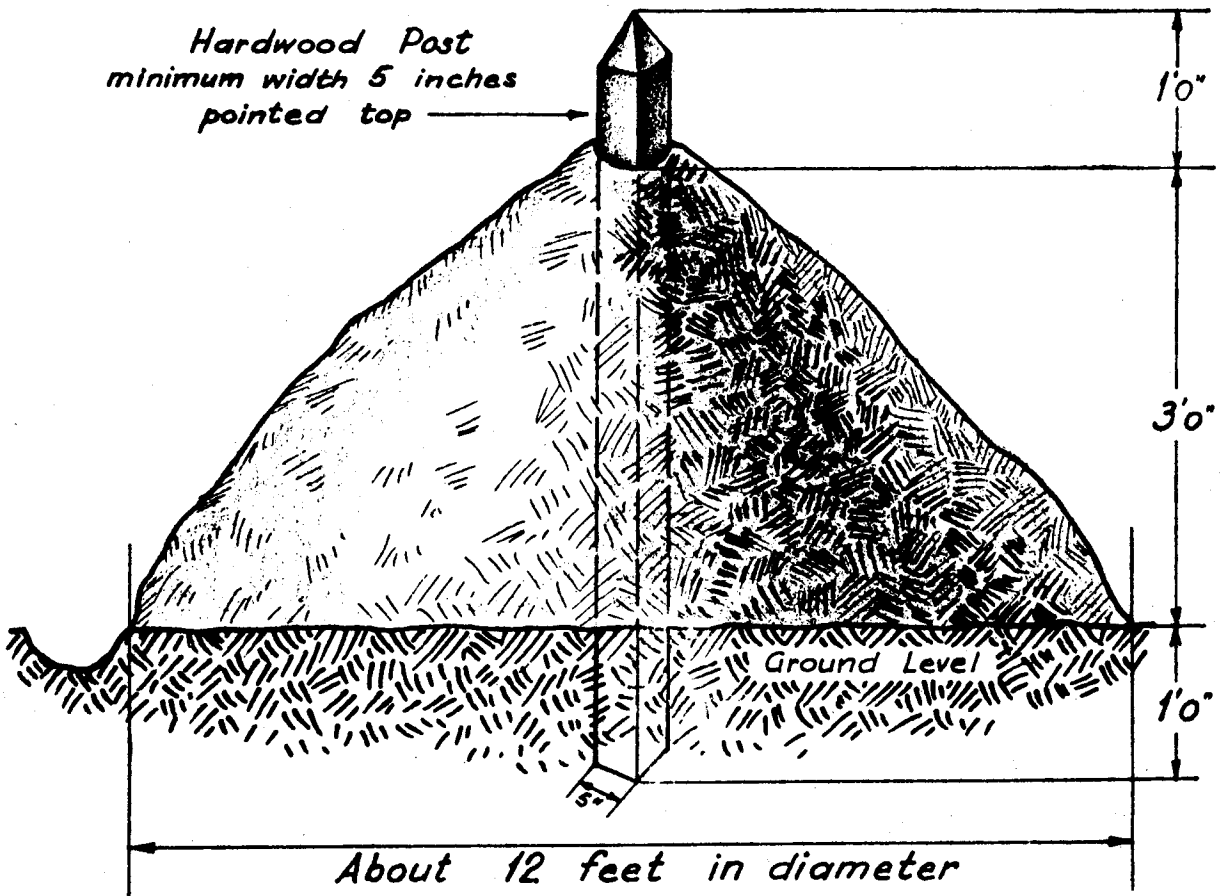


*To be used to mark boundaries of
Native Land by the Land Titles
Commission*

L.S.M. 7

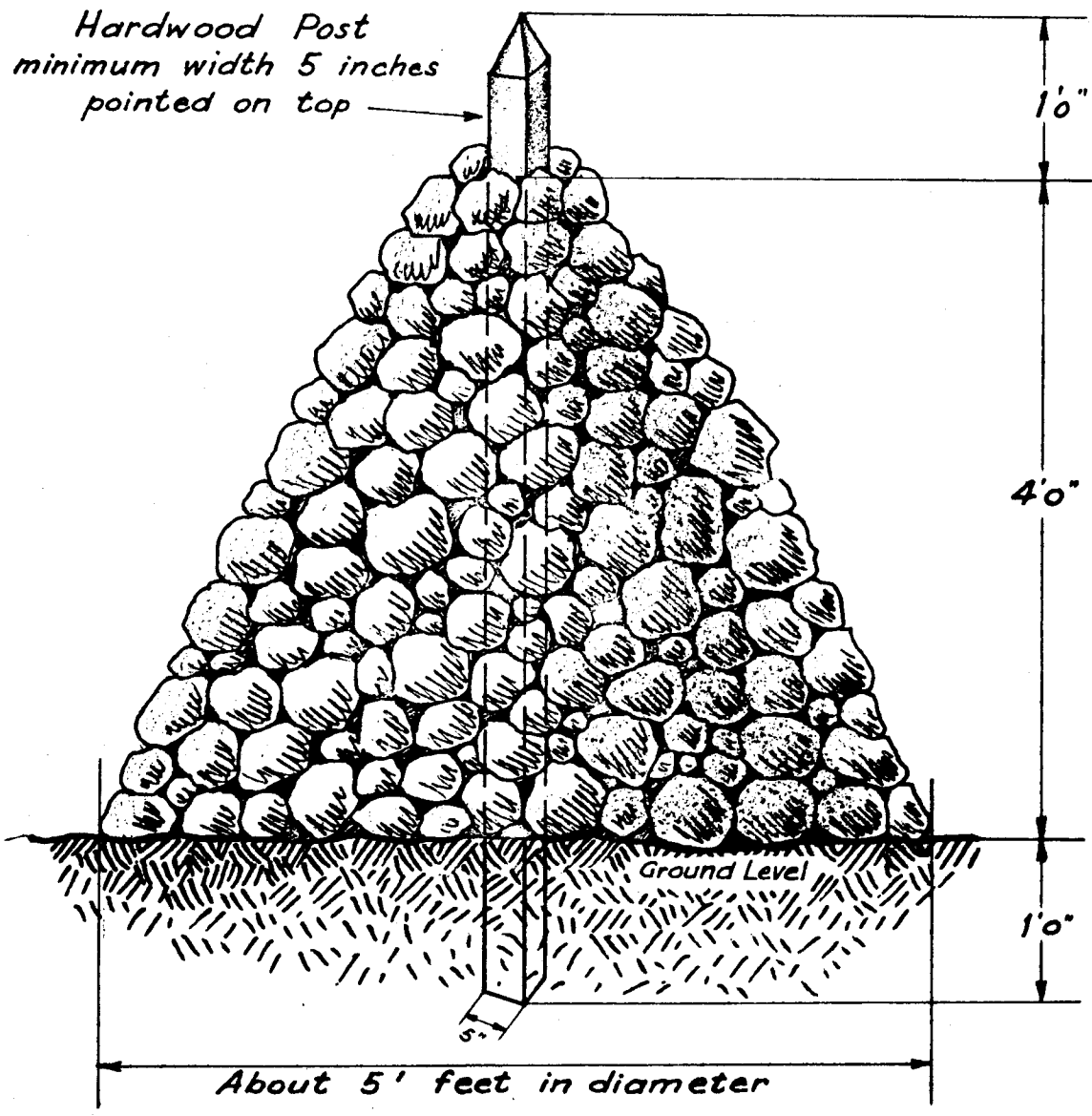
MOUND OF EARTH

CORNER MARK, PURCHASE OF NATIVE LAND



CAIRN OF STONES

CORNER MARK-PURCHASE OF NATIVE LAND



APPENDIX 10

LAND TIERRAS COMMISSION

PRO FORMA

Certification of Survey

Conversion Order

TERRITORY OF PAPUA AND NEW GUINEA

STATUTORY DECLARATION

(CERTIFICATION OF SURVEY)

IN THE LAND TITLES COMMISSION

Sub-District No.

IN THE MATTER OF an Application by

under Section of the
Ordinance.

I, of
do solemnly and sincerely declare that I drew (or caused to be
drawn) the locality map and survey plan which appear on the back
hereof.

THAT the boundaries were marked off by means of
and were pointed out to me by as
being the subject matter of this application.

AND I make this solemn declaration by virtue of the Oaths,
Affirmations and Statutory Declarations Ordinance, 1962 conscien-
tiously believing the statements contained therein to be true in
every particular.

Declared at the day of , 19 .

.....
(Signed)

Before me:

.....
Commissioner for Declarations
or Justice of the Peace.

5 copies.

TABLE 1

TITLES REGISTERED UNDER THE REAL PROPERTY ORDINANCE AND
LAND REGISTRATION ORDINANCE AT 15/11/65

Real Property Ordinance

Freehold Certificates of Title	210	
Crown Leases	<u>2154</u>	
		2364

Land Registration Ordinance

Freehold Certificates of Title Restored	551	
New titles on		
New Register	<u>240</u>	
		791
<u>Administration Leases</u>	Restored	402
	New titles on	
	New Register	<u>1303</u>
		1705
		<u>4860</u>

TABLE 2

TITLES RESTORED TO REGISTER UNDER NEW GUINEA LAND TITLES

RESTORATION ORDINANCE AT 15/11/65.

<u>Freeholds</u>	Restored to old Register	401
	Restored to new Register	150 (estimate)
	(old title numbers unknown)	-----
		551

Administration Leases

	Restored to old Register	217
	Restored to new Register	185 (estimate)
	(old title numbers unknown)	-----
		402
		==
		953

TABLE 3

ESTIMATED NUMBER OF TITLES AT CESSATION OF CIVIL

ADMINISTRATION 14/2/42

Final Certificates of Title	1,217
Administration Leases	993
Draft Certificates of Title (in process of conversion from Grundbuch to Torrens Register under Land Registration Ordinance)	1,310
Deeds in the Index of Unregistered Administration Land	Unknown
Mining and Forestry Licences	Unknown

TABLE 4

FIELD OF SURVEY OF AGRICULTURE CONVERSION SCHEMES. (1)

Scheme	Blocks/ Acres	Man days(2) Field Officers Only.	Acres/ Man Day.	Blocks/ Man day	Remarks
Ahora	36/720	19	38	1.9	
New Warisota	32/540	16	40	2.0	
Barisari I	55/1,680	75	22	0.7	Assisted by an Agricultural Officer for 54 days.
Barisari II	7/210	15	14	0.5	
Dobadura-Buna	63/1,260	39	32	1.6	Includes resurvey
Ombisusu	43/800	72	11	0.6	Assisted by an Agricultural Officer for 7 days and Agricultural Assistant for 21 days.
Somara	16/200	22	9	0.5	Assisted by an Agricultural Assistant for 22 days.
Dapori	44/1,090	35	29	1.3	
Mean			23	1.0	

(1) Figures collected from Field Journals at Port Moresby and Popondetta.

(2) Time spent includes preparation, discussions, travelling, time in field and office, delays.

TABLE 5
RATE OF SURVEY BY LAND SURVEYING DIVISION - LAND
SETTLEMENT SCHEMES (1)

Scheme	Time (2) men days (field officers & superiors)	Acreage	Acreage per man day (3)	Remarks
Vanigela	330	2,857	12	only 3-4 days delay
Uasilau	124	3,618	34	17 days delay
Silanga	267½	6,897	39	Some journals missing; 25 days delay
Keravat (Lots 1 & 2 Por. 370)	17	525	31	No external boundary; subdivision only; field work only.
Komondo	48	653	14	7 days delay
Lower Eddie Creek No. 3	31½	692	46	2 days delay; Some agricult- ural and some garden blocks.
Wau Administ- ration land Subdivision No. 1	35½	1,510	23	1 day delay; 22 agricultural and 40 garden blocks.
Bailebo	106	3,293	32	3 days delay
Mean			29	

- (1) Compiled from field Officers' Journals, Land Settlement Division.
- (2) Time taken for survey includes preparation, travel, striking camp, office work, field work, delays.
- (3) The rate depends on the amount of external boundaries surveyed.

TABLE 6
ESTIMATED INDIGENOUS SCHOOL LEAVERS (1)

Year	Standard 5	Form 1	Form 2	Form 3	Form 4	Form 5	Form 6
1966 A	1,577	659	806	715	397		
1966 B		98	1,006	-	12		
1967 A	2,228	794	1,134	1,107	576		22
1967 B		131	597	-	25		
1968 A	2,779	1,475	1,302	1,285	1,121		40
1968 B		115	1,372	-	32		
1969 A	3,271	1,217	1,432	1,737	1,576		55
1969 B		108	966	-	75		

A Administration and Mission Secondary Schools. B. Administration Technical and Junior Technical Schools.

(1) Compiled from Department of Education Information Bulletin. No.2, July, 1965.

TABLE 7

ASSOCIATION OF SURVEYORS OF PAPUA AND NEW GUINEA MEMBERSHIP

Date	Corporate	Associate	Student
12/62	24	2	0
2/64	30	4	0
6/65	38	8	5

TABLE 8

BACK-LOG IN THE REGISTRATION OF CROWN AND ADMINISTRATION
LEASES AT OCTOBER 1960 (1)

	Total Number of Lease Applications Granted	Number still in Stage of "Granted Application for a Lease"	Documents in Course of Preparation for Registration
Territory of Papua	2,376	2,245	42
Territory of New Guinea	3,165	2,942	55

Reasons for delay:-

- | | | |
|----------------------------|---|--------------------------------|
| (i) Survey | } | Refer
Chapters 5, Para. 1.9 |
| (ii) Administrative delays | | |

Temporary alleviation of the problem has been provided by the Real Property (Registration of Leases) Ordinance, 1963 which permits registration of leasehold titles "subject to survey".

(1) L.C. Debates 4th Council, 1st Meeting, 1st Session,
17th - 22nd October, 1960 Vol. 5, No. 1.

TABLE 9

EARLY INDIVIDUALISATION OF TENURE IN THE NORTHERN DISTRICT (1)

<u>Scheme</u>	<u>Dimensions of Blocks</u> (<u>chains</u>)
Kurou	2 x 1
Hegata	1 x 1
Gewoto	5 x 5
Beuru	4 x 1
Gona	4 x 1
Huhuru	4 x 1
Sanamanda	3 x 1
Ehu	5 x 1
Bepora	10 x 1
Dobadura	abandoned
Kaparahambo	3 x 1
Soputa	3 x 1
Kipore	5 x 10
Senani	5 x 10
Bakumbari	5 x 10
Ongoho	5 x 10
Girigirita	5 x 10
Garara	5 x 10

(1) 2/9/65 A.O. (Smith) to D.A.O. (N.D.)

D.A.S.F. (Pop) Land Tenure Conversion Reports - General File.

TABLE 10

PROGRESS IN CASH CROPPING IN THE NORTHERN DISTRICT

1960-1965 (1)

(large percentage of plantings on individual parcels)

<u>Year</u>	<u>Total area in acres planted to cocoa and coffee in the year.</u>
1960	1,030
1961	1,230
1962	1,540
1963	1,730
1964	2,100
1965 (projection)	2,400

(1) 17/9/64 : D.A.O. (N.D.) to Dir. D.A.S.F.

D.A.S.F. (Kone) Land Tenure Conversion File

TABLE 11

SUMMARY OF PROGRESS IN TENURE CONVERSION IN THE
NORTHERN DISTRICT AT DECEMBER 1965 (1)

	Blocks	Acreage
Titles granted or in the process thereof. . .	219	4,328
Awaiting Department of Agriculture, Stock and Fisheries feasibility investigations . . .	596	12,570
With Department of District Administration for investigation	64	1,280
Surveyed but awaiting plans	120	3,148
Being surveyed by the Department of Agriculture, Stock and Fisheries	110	2,260
Awaiting survey	269	2,960
Miscellaneous (e.g. awaiting choice of site, processing of communal claims)	347	7,020

(1) 21/12/65 A.O. to D.A.O.(Pop)

D.A.S.F. (Pop) file 12-1-A (3)

TABLE 12

TENURE CONVERSION SCHEMES IN NORTHERN DISTRICT WITH
GRANTED TITLE OR IN THE PROCESS OF CONVERSION AT DECEMBER, 1965

	<u>Blocks/Acres</u>		
Yega	57/600	90 day period elapses	15/12/65)
Barisari I	56/1 680	90 day period elapses	31/12/65)
New Warisota	30/600	90 day period elapses	31/12/65)
Ombisusu	40/800	hearing	9/2/66
Ahora	36/648	hearing	28/1/66

* Decisions given.

TABLE 13

DEPARTMENT OF LANDS, SURVEYS AND MINES - SURVEY POSITIONS CLASSIFIED AND OCCUPIED
 AT 30TH JUNE, 1953 TO 30TH JUNE, 1965. (1) (2)

Classification Prior to 1964	Chief of Division		Principal Surveyor (Supervising Surveyor prior to 1952-63)		Senior Surveyor		Surveyor Grades 3-1	
	C.P.	O.P.	C.P.	O.P.	C.P.	O.P.	C.P.	O.P.
Approximate Equivalent Classification from 1964-1965	Chief of Division		Surveyor Class 3		Surveyor Class 2		Surveyor Class 1	
1953-1954	1				3		6	5
1954-1955	1				3	X	14	X
B55-B56	1						22	X
1956-1957	1						22	X
1957-1958	1						22	X
1958-1959	1	1			6	4	31	11
1959-1960	1	1			6	6	31	14
1960-1961	1	1	3	1	10	4	38	9
1961-1962	1	1	3	3	10	4	35	8
1962-1963	1	1	3	3	10	5	38	6
1963-1964	1	1	3	3	10	9	38	7
1964-1965	1	1	3	3	10	6	19	5

(1) Compiled from Annual Reports of Papua and New Guinea.
 (2) All positions are occupied by expatriates unless otherwise indicated.

TABLE 14

SURVEYORS LICENSED IN PAPUA AND NEW GUINEA.

	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
Not Resident in Territory	21	21		29	29	29	28	36	37	6	8
Papua	8	8		7	9	10	9	8	10	11	13
New Guinea Mainland - Highlands	0	0		1	2	3	3	4	7	5	6
New Guinea Mainland - Coastal	4	4		3	3	5	5	4	4	7	8
New Guinea Islands	4	4		4	6	7	8	4	5	8	7
Total	37	37		44	49	54	53	56	63	37	42

← Surveyors registered under R.P.O. AND I.R.O.

→ Surveyors Registered under S.O.

TABLE 15

COST OF "AUTHORIZED" CONTRACT SURVEYS. (1)

Scheme	No. of Parcels	Area (Acres)	Cost \$	Cost/ Land Settle- ment Block	Cost Per Acre \$	Remarks
Sorovi	54 ag. blocks, 1 community area	1,528	11,300	210	7.2	External boundar- ies included.
Tabai-Rickau Por. 88-148	61 ag. blocks, + remainder	2,437	28,792 (account only)	472	11.8	External boundaries included.
Sunum	17 ag. blocks, 2 village reserves	353	2,158	127	6.1	Internal sub- division only.
Mavillo	17 ag. blocks	347	2,567	151	7.4	Internal sub- division only.
Vasilau Por. 149-167	15 ag. blocks	556	9,434 (account only)	496	16.9	Internal sub- division only.
Merani Extension Por. 480-490	10 ag. blocks	169	2,452	245	14.5	External boundar- ies included.

(1)

Statistics compiled from Payments to Contract Surveyors' Register,
Private Surveyors' Instruction Register and Survey Instruction Files,

D.T.S.M. (Kone).

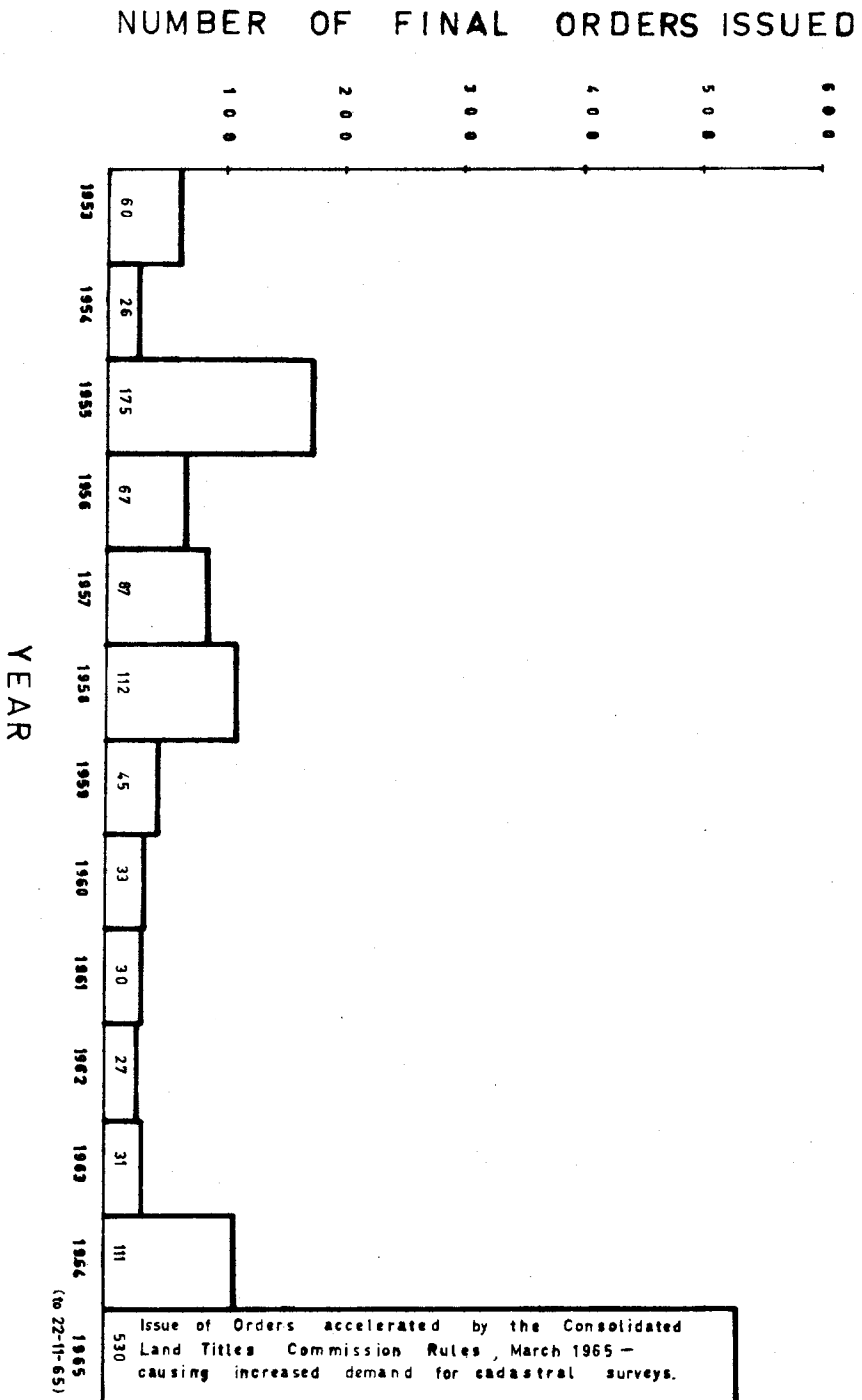
TABLE 15 (CONT'D)

Scheme	No. of Parcels	Area (acres)	Cost \$	Cost/Land Settlement Block (\$)	Cost per acre (\$)	Remarks
Don Por. 59-03	30 ag. blocks	830	8,155	272	9.8	External boundaries included.
Davilelelo Por. 149-171	22 ag. blocks	545	7,622	345	11.8	External boundaries included.
Bulu	10 ag. blocks + remainder	724	9,535	530	13.2	External boundaries included.
Bitum Por. 39-60	22 ag. blocks	544	7,162	326	13.2	External boundaries included.
Kerevat Lots 1 & 2 of Por. 370 into Por. 755-781.	17 ag. blocks	525	3,988	235	7.6	Internal sub-division only.
Mori Dam-Guina No. 1 Por. 151-244	03 ag. blocks, 2 plantations	2,408	23,500 (account only)		9.8	External boundaries included.
Kaloki	4C market parcels + 2	355	5,304	115	14.9	External boundaries included.
Koravu +	1 Large tract	1011				External boundary and internal road included.
Pangalu	23 ag. blocks	900	12,534		5.6	External boundary included.

DIAGRAMS

FINAL ORDERS ISSUED BY THE COMMISSIONER OF TITLES UNDER THE NEW GUINEA LAND TITLES RESTORATION ORDINANCE

FIGURE 1



Note: Some Orders may include more than one parcel of land.

FIGURE 2
PROPOSED ORGANISATION CHART
SURVEYING AND MAPPING AUTHORITY

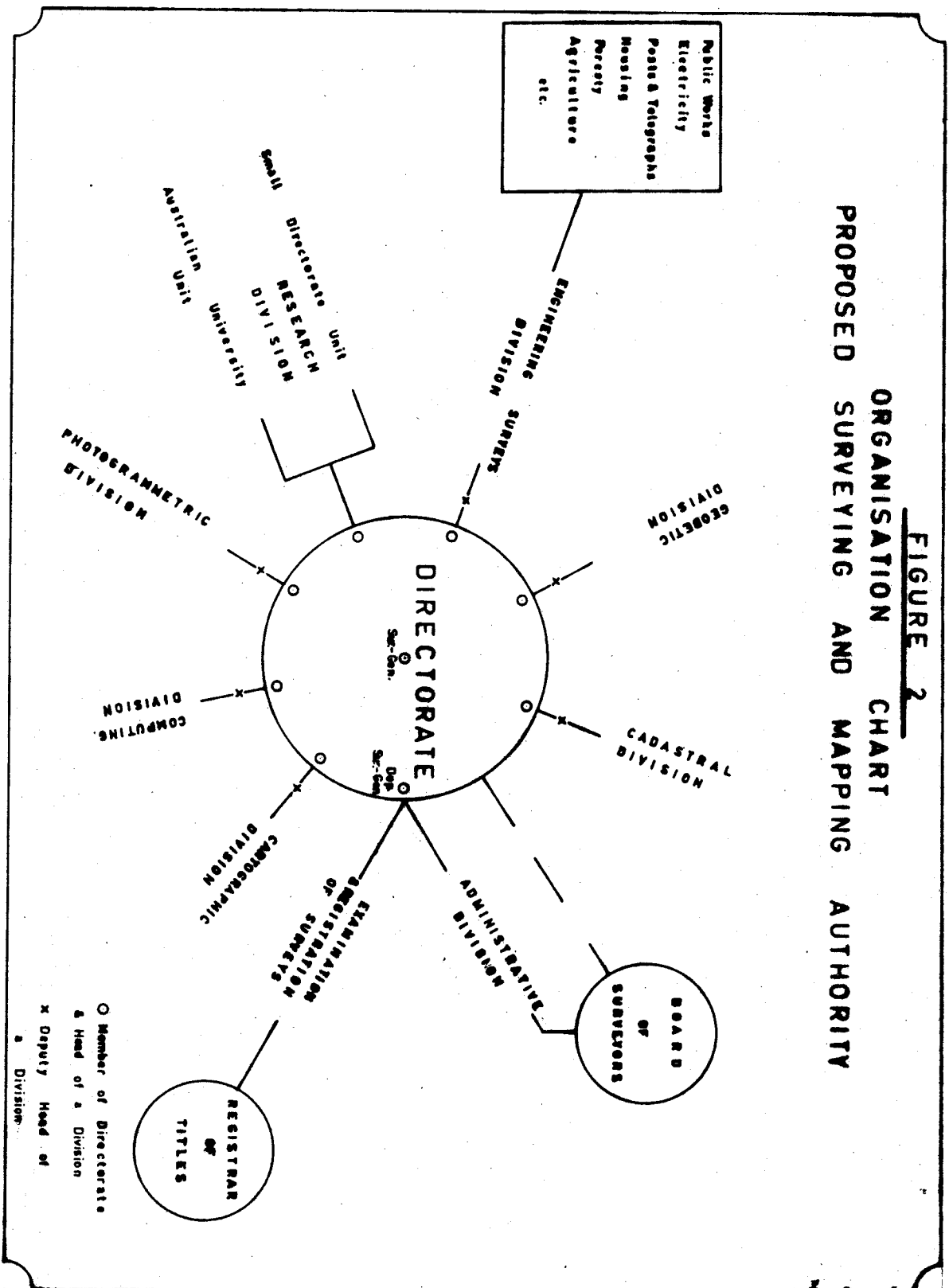


FIGURE 3
PROPOSED DIVISION OF LABOUR
TERRESTRIAL SURVEY OPERATIONS

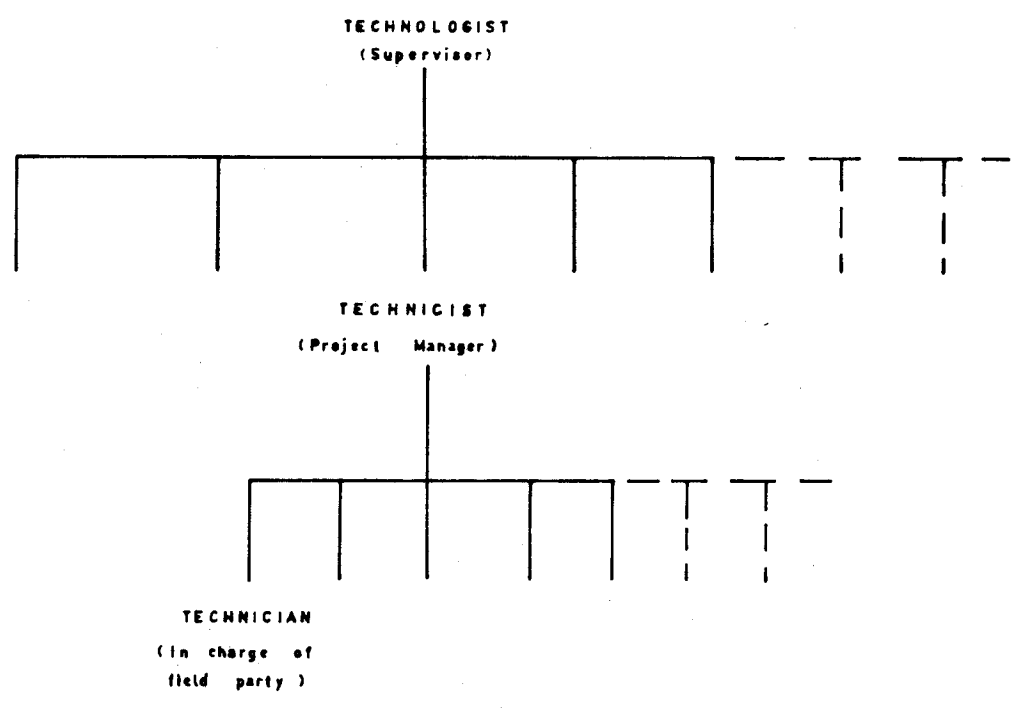


FIGURE 4 LAND REGISTRATION OPERATIONS

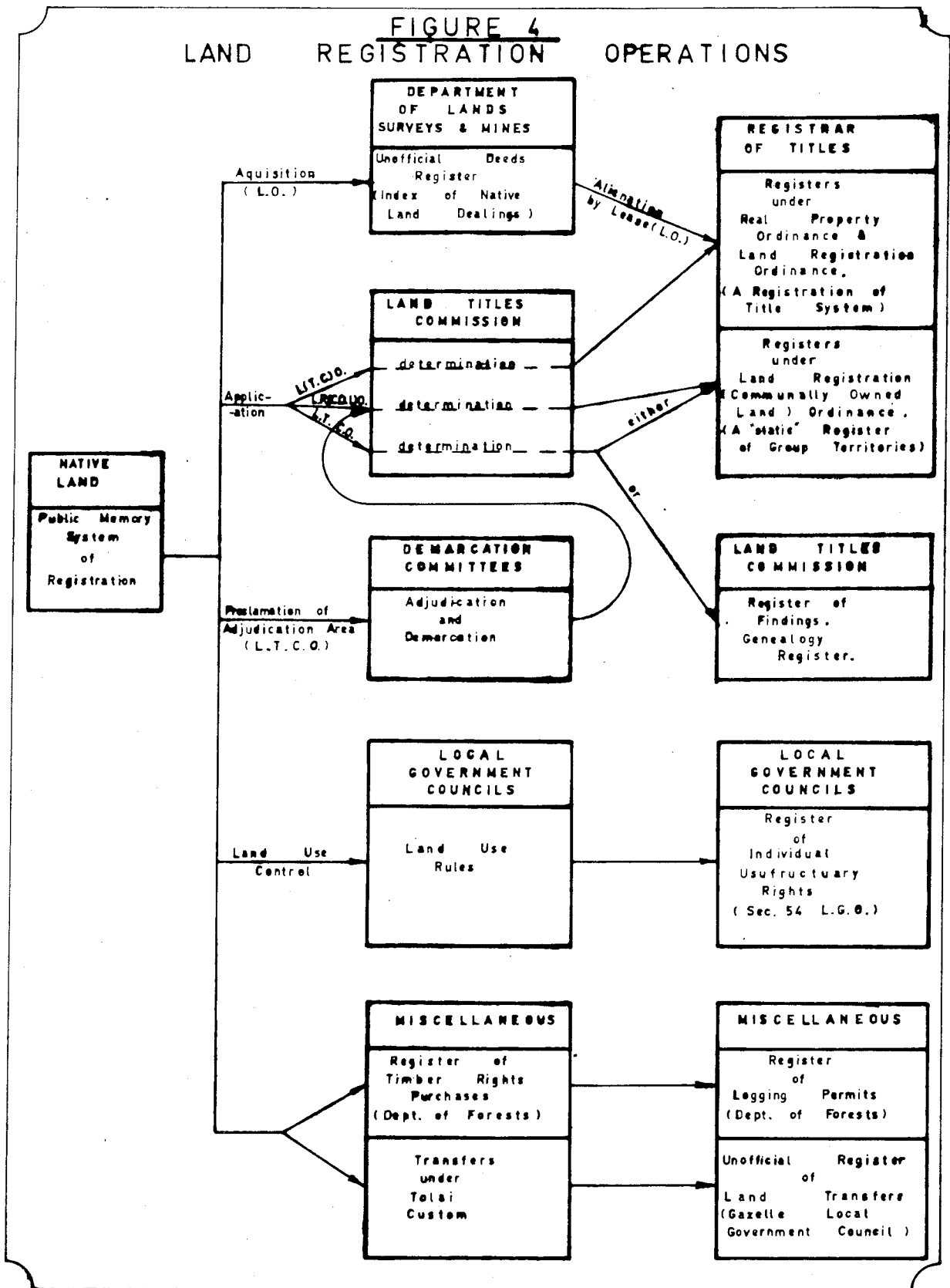
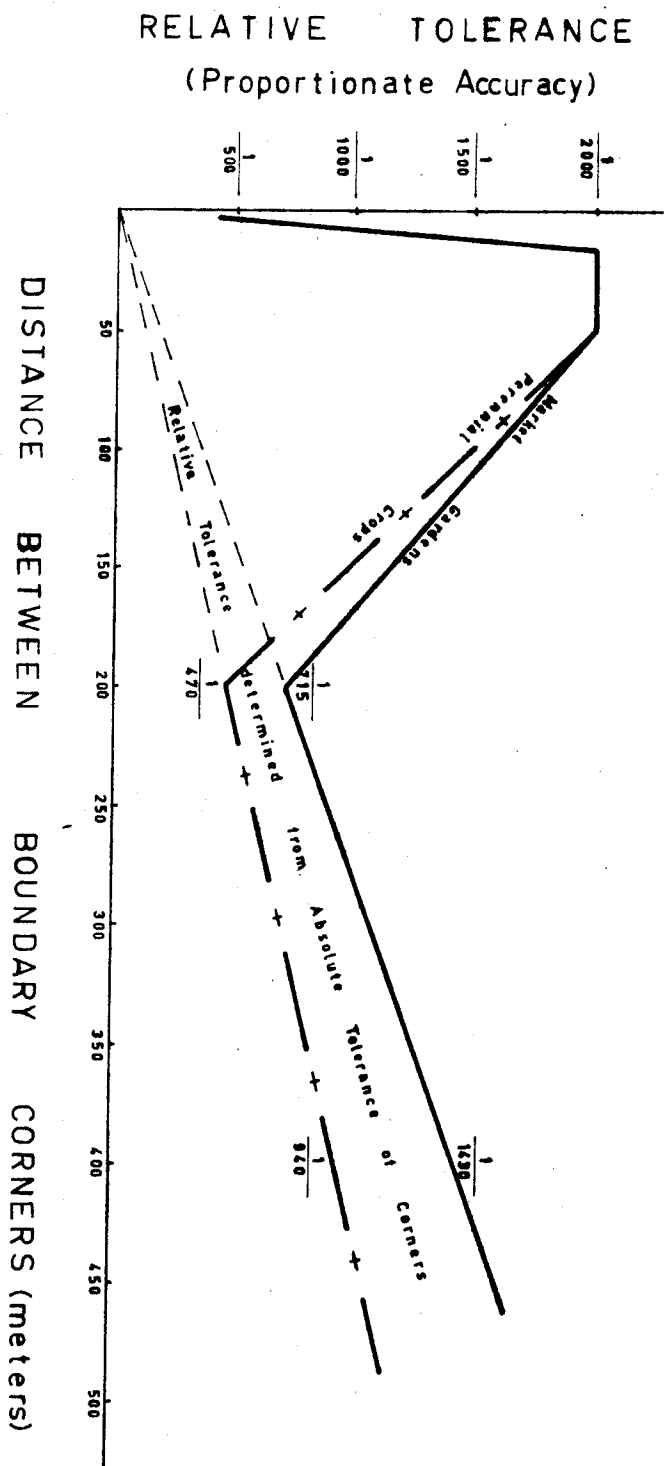
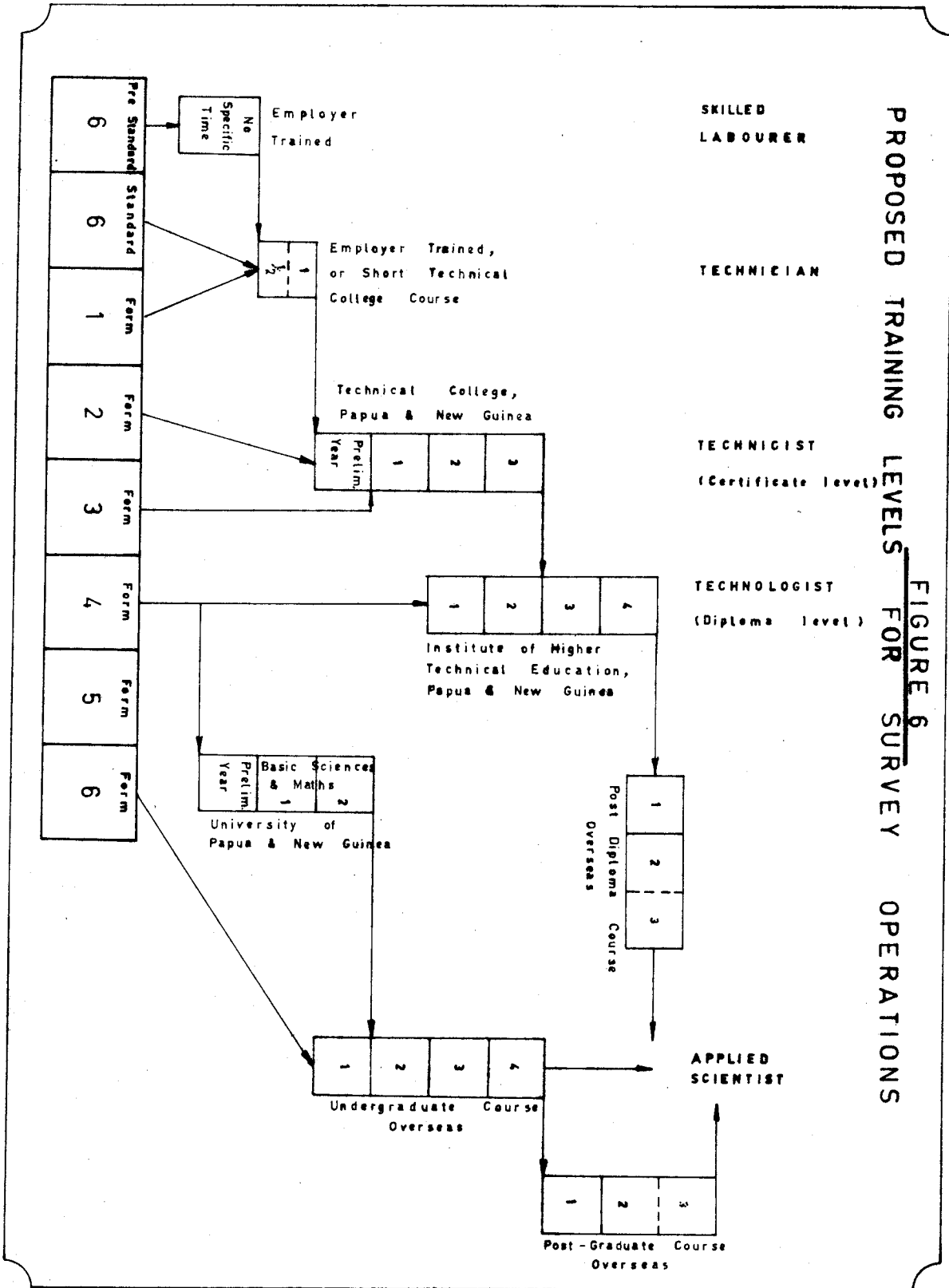


FIGURE 5
MODEL RELATIVE TOLERANCES
FOR THE SURVEY OF NATIVE
LAND USED FOR CASH CROPPING



PROPOSED TRAINING LEVELS FOR SURVEY OPERATIONS
FIGURE 6



ABBREVIATIONS

A.O.	Agricultural Officer
A.R. (P)/(N.G.)	Annual Report (Papua)/(New Guinea)
A.S.O.P.A.	Australian School of Pacific Administration.
A.S. P.N.G.	Association of Surveyors of Papua and New Guinea.
A.N.U.	Australian National University
C.O.N.G.A.	Council on New Guinea Affairs.
C.S.I.R.O.	Commonwealth Scientific and Industrial Research Organisation.
D.A.	Deed of Attestation
D.A.O.	District Agricultural Officer
D.A.S.F.	Department of Agriculture, Stock and Fisheries
D.C.	District Commissioner
D.D.A.	Department of District Administration
D.F.	Department of Forests
D.L.S.M.	Department of Lands, Surveys and Mines.
F.O.	Field Officer.
Dir.	Director
D.N.A.	Department of Native Affairs (now Dept. of District Administration)
Kone.	Konedobu (Headquarters of the Administration).
L.A. Debates	Legislative Assembly Debates.

L.C. Debates	Legislative Council Debates
L.D.B.	Land Development Board
L.G.C.	Local Government Council
L.O.	Land Ordinance
L.R.O.	Land Registration Ordinance
L.R.(C.O.L.)O.	Land Registration (Communally Owned Land) Ordinance
L.T.C.	Land Titles Commission
L.T.C.O.	Land Titles Commission Ordinance
L.(T.C.) O.	Land (Tenure Conversion) Ordinance
N.B.	New Britain
N.D.	Northern District
N.G.I.	New Guinea Islands
N.G. L.T.R.O.	New Guinea Land Titles Restoration Ordinance.
N.G.R.U.	New Guinea Research Unit
N.L.C.	Native Land Commission (now Land Titles Commission)
N.L.D.	Native Land Dealing
N.L.R.O.	Native Land Registration Ordinance.
O.I.C	Officer-in-Charge.
Pop.	Popondetta
P.S.	Principal Surveyor
Rab.	Rabaul
R. of T.	Registrar of Titles
R.P.O.	Real Property Ordinance

R.P.(R.L.)O.	Real Property (Registration of Leases) Ordinance
T.P.N.G.	Territory of Papua and New Guinea
U.A.L.	A Deed of Transfer kept in the Index of Unregistered Administration Land

GLOSSARY

ABSOLUTE ACCURACY: The degree of certainty with which the position of a ground point is known with reference to some fixed datum.

AGRARIAN STRUCTURE: The institutional framework of agricultural production.

APPLIED SCIENTIST: One trained in the basic sciences and in how such sciences can be applied to particular technical processes.

CADASTRAL SURVEY: That technical process required to obtain data for the record of parcels in a Land Registration System.

CADASTRAL UNIT: A portion of the terrain conveniently sized for the purpose of land administration.

CADASTRATION: The process of initiating and maintaining a national register of rights in landed property.

CADASTRE: The actual register or series of registers used in the land registration system. It normally consists of two series of registers:-

1. The descriptive series - registers of rightholders, listings of properties, types of land use, mortgages, transfers, rights, etc.
2. The cartographic series - maps and plans of the parcels.

EXPATRIATE: Those people dwelling in the Territory of Papua and New Guinea who are not descendants of the native inhabitants - the majority are Australians and Chinese.

"FRAME" CADASTRAL UNIT: Cadastral units based on a series of rectangular map sheets.

GRUNDBUCH SYSTEM: The Prussian version of the Registration of Title system of land registration.

"INCOMPLETE" SYSTEM OF LAND REGISTRATION: A land registration system where all de facto rights and obligations relating to land are not registered.

INDEFEASIBILITY, UNREPEACHABILITY: These words are misnomers when used in connection with a land registration system. They have tended to give a false impression of what a Torrens system guarantees.

INDIVIDUALISED TENURE: This term should be avoided where possible as it implies a tenorial arrangement where an individual holds all the rights over a land parcel.

Where it is used for convenience in this thesis, "proprietary right" is implied.

INSURANCE PRINCIPLE: If, through human frailty, a flaw appears in the mirror, anyone suffering loss will be compensated as if the reflection of the mirror were true.

"ISLAND" CADASTRAL UNIT: Cadastral units of irregular shape and uneven size. Natural features often serve as boundaries.

LAND REFORM: Organised action for the purpose of improving the existing land system or agrarian structure.

LAND REGISTRATION SYSTEM: That administrative system devised in a society to record the land tenure system.

LAND SYSTEM: The system of holding, dealing with and using land.

LAND TENURE: That system by which the rights and obligations of the individuals and groups in any society in respect of land are distributed, exercised and transferred. (1)

A "LIVING" LAND REGISTRATION SYSTEM: A land registration system in which all registers are kept accurately up-to-date. Registered conveyancing is the most common means by which the registers are kept up-to-date.

MIRROR PRINCIPLE: The register is a mirror which reflects accurately and completely and beyond all argument the current facts that are material to the matter being recorded. Anything which does not appear in the register is either incapable of registration or not permitted to be registered.

(1) Ref.135.

MUTATION: Any change in title, rightholder or parcel.

NEW GUINEAN: Includes Papuans and New Guineans.

OPTIMISATION OF TECHNIQUE: The procedure of planning survey operations by quantitative analysis such that the capabilities of a given technique are fully exploited.

OWNERSHIP OF LAND: This is avoided where possible because of vagueness of meaning.

In general, "ownership" conveys two main implications:-

- (i) the right to use land,
- (ii) the right to determine the nature and extent of its use by others, including the outright transfer of rights to others.

Where used in the thesis it can be equated to "proprietary right".

PROPRIETARY RIGHT: Exclusive right to the use and disposal of land, subject to conditions (if any) laid down by the community.

REAL PROPERTY: The distinction between "real" and "personal" property in land developed in the Middle Ages in Britain. The term should be avoided in modern land law. It is desirable to classify all interests in land as "landed interests" or "landed property".

RECONNAISSANCE: The procedure of judging the relative merits of various survey techniques by qualitative and quantitative means. Judgement is based on the cost, accuracy and the suitability of the terrain.

REFERENCE MARK: A permanent mark selectively placed so as to be a reference point of a survey and a point of origin for a retracement survey.

A minimum of two reference marks is necessary to provide for an azimuth and datum in the case of retracement.

RELATIVE ACCURACY: The degree of certainty with which the positions of two ground points are known with respect to each other.

A RIGHT IN LAND: A justifiable claim, on legal, customary or moral grounds, to have or obtain something, or to act in a certain way, in relation to land.

SYSTEM OF CORRELATED SURVEYS: A system whereby surveys are regarded basically as independent units but are correlated to each other. The surveys remain unconformed to an ordered whole.

The degree of correlation(connection) may vary considerably, e.g. a low degree of correlation:- where all surveys have a common azimuth but no reciprocal connections; a high degree of correlation:- where reciprocal linear and angular connections exist between all surveys.

SYSTEM OF INTEGRATED SURVEYS: A system whereby individual surveys, no matter how sporadic, are interrelated as parts of an integrated whole.

This system necessitates the ordered sequence of methods and procedures such that all surveys can be uniformly related and conformed to each other.

SYSTEM OF ISOLATED SURVEYS: A system whereby surveys are regarded as independent units; are only connected to each other if convenient; and are unconformed to an ordered whole. The surveys are usually sporadic (dispersed in locality and time).

TECHNICIAN: One trained in the practical skills and the elementary office calculations associated with a technical operation.

TECHNICIST: One trained in the normal methods and techniques associated with the application of the basic sciences to particular technical processes.

(Sufficient training in the basic sciences is given in order that the Technician may perform normal office computations).

TECHNOLOGIST: One trained in the various methods and techniques associated with the application of the basic sciences to particular technical processes. (This includes a background training in the basic sciences and in the design and planning of technical operations such that

optimum use is made of equipment, methods and techniques).

TENURE "RATIONALISATION" The modification or replacement of the customary land tenure system so that land productivity can be optimised.

TITLE: The power accorded by the laws or customs of a community to exercise a right or obligation over land.

Also: The means whereby that power is evidenced (e.g. the dispositive acts and facts which give rise to the right or obligation).

TORRENS SYSTEM: The Australian version of the Registration of Title system of land registration.

WITNESS MARK: A permanent mark selectively placed near a corner mark for use in relocation of that corner.

A minimum of two witness marks is necessary to relocate a corner without resurvey to adjacent corners.

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ABBREVIATIONS

AL.J.	Australian Law Journal
C.C.S.O.	Conference of Commonwealth Survey Officers.
E.S.R.	Empire Survey Review
F.I.G.	International Federation of Surveyors
J.I.L.S.T.	Journal of the Institute of Land Surveyors of the Transvaal.
J.S.M.	Proceedings of the American Society of Civil Engineers Journal of the Surveying and Mapping Division.
J.T.P.I.	Journal of the Town Planning Institute.
O.U.P.	Oxford University Press
Photo. Eng.	Photogrammetric Engineering.
S.A.S.C.	Proceedings of the National Conference of South African Surveyors.
S.A.S.J.	South African Survey Journal.
U.N.C.C.	United Nations Cartographic Conference for Asia and the Far East.
Z.f.V	Zeitschrift für Vermessungswesen

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