

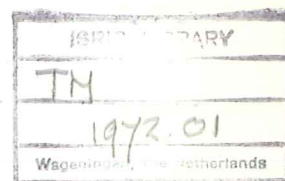
GENERAL LAND CAPABILITY MAP OF THAILAND

KINGDOM OF THAILAND
MINISTRY OF NATIONAL DEVELOPMENT
DEPARTMENT OF LAND DEVELOPMENT AND
FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS.

LAND CLASSIFICATION DIVISION.



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GENERAL LAND CAPABILITY MAP OF THAILAND

By the staff of the F.A.O. Project for Strengthening Soil Survey and Land Classification, and the Land Classification Division of the Department of Land Development.

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INTRODUCTION

The general land capability map of Thailand provides information of the Kingdom's soils in terms of suitability for agricultural uses. In preparing the map the soils of the country were placed into nine general groups, with the members of each group having similar characteristics. Each group is described briefly and the approximate extent and percentage are given. In addition, the map shows for each group the most significant land classes, general suitabilities for cultivated crops, estimates of the present use, potentials for increased agricultural production, major inputs required to reach potentials, and some crops suitable for increase (but not necessarily in all parts of a map unit, because of climatic differences).

This overall view of soil resources will be of value to planners in government agencies, educators, research workers, and others who have responsibility for use and management of agricultural lands. Such purposes as determining development possibilities of major areas, selection of land for resettlement of farmers, choice of improvement project sites, planning for increases in crop production and establishing goals all require knowledge of soils and their potential. While a general map does not supply the detailed information needed in most cases for final decision, it does give indications of broad areas with different potentials and points out the alternative locations in which more detailed investigations should be made for specific purposes.

SOURCES OF INFORMATION

The General Land Capability map is an interpretation of information about the soils, derived from a number of sources. The first systematic study of soils in Thailand was started by Dr. R.L. Pendleton in 1935 and was presented in his "Provisional Map of the Soils and Surface Rocks of Siam". For some years the developing soil survey activities were divided among several government agencies, until in 1963 the major responsibility for a national soil survey program was assigned to the Department of Land Development. Assistance has been obtained from USOM and FAO in strengthening the program.

The Soil Survey Division of the Department of Land Development is now engaged in a systematic soil survey of the Kingdom by provinces, and has completed surveys of sixteen provinces. These are mostly detailed reconnaissance surveys, made at a scale of 1:100,000. Semi-detailed surveys at a scale of 1:50,000 have been made in parts of the Central Plain. In addition, reconnaissance surveys at a scale of 1:250,000 are being completed of Peninsular Thailand, and numerous surveys of smaller areas have been made throughout the country for specific purposes. (See the list of Soil Survey Reports in the back of this report).

The Kingdom of Thailand General Soil Map by F.R. Moormann and S. Rojana-soonthon is a broad reconnaissance at a scale of 1:1,250,000. It was based on studies made from 1961 to 1966, including reconnaissance by the authors, general interpretation of available airphotos and topographic maps, and information from the soil surveys carried out by the Soil Survey Division.

The General Soil Map was a principal source of information, as were provincial soil maps and land classification maps in the Northeast, part of the Central Plain and the Chiang Rai area. The map of General Land Suitability for Crop Diversification in Peninsular Thailand, 1969, by F.J. Dent was used in that region, together with information from the reconnaissance survey of the region now in progress. Some additional field studies were made, but these were very limited because of lack of time. Reliability is considered good to fair except in the less accessible mountain areas where it may be uncertain. Compilation of hydrology, cultural features and soil boundaries from differing base maps has resulted in minor displacement of certain features, but the displacement will not detract from general use of the map.

GENERAL SOIL GROUPS

All of the soil conditions of the Kingdom have been placed in nine major groups according to their general suitability for cultivated crops, and these are shown on the map by a number symbol and color. The principal rice growing areas are included in groups 1, 2 and 3, which represent respectively lands which have a high proportion of very good, good, or fair soils for paddy (wetland rice). Shades of yellow are used to show these areas, with a different intensity for each group.

Significantly large areas, principally in the Northeast and on the western side of the Central Plain, consist of associations of uplands and lowlands which can not be separated at the scale used for the map. These are approximately half lowlands suitable for paddy, and half somewhat higher lands not suited for paddy but suitable for those upland crops which are adapted to the climate. Such areas are placed in groups 4 and 5 and shown on the map in shades of bluish green. Group 4 includes a high proportion of lands which are well suited for crops, and group 5 consists largely of areas that are moderately to poorly suited for crops.

Undulating to rolling areas that consist principally of well drained soils suited for climatically adapted upland crops are placed in groups 6 and 7, and shown by shades of brown on the map. The smoother areas which are well suited for upland crops are placed in group 6 and the less fertile or more steeply rolling areas, which present more difficult problems of management, are placed in group 7.

Group 8 is made up principally of steep soils and miscellaneous land units, including areas with laterite near the surface. Soils in this group are not generally suited for cultivated crops except for small inclusions of better soils. They are shown on the map by grayish purple.

Areas of mostly non-agricultural land, including beach and dune sand, saline alluvial soils, peat and muck, are in group 9, and shown on the map by a weak shade of grayish purple.

LAND CAPABILITY CLASSES

For each map unit the important land capability class is shown. This is not an average class within the unit, and may not be greatest in extent. Instead, it is intended to give the class which is most significant for agricultural production in the area. A map at this scale can not show individual areas of the capability classes as defined, but each of the map units has characteristic soils and related conditions which form a pattern of land classes, and it is possible to suggest land classes on which most crops are produced or on which improvements would be most profitable.

The land capability classes suggested in the table for each of the units are those in use by the Land Classification Division, Department of Land Development. (Soil Survey Report no. 60, Land Development Department, 1967, and subsequent reports). Two classifications are defined, one for upland crops, and one for paddy (wetland rice).

For upland crops eight classes are defined. Soils in classes U-I through U-IV are suitable for cultivated upland crops, with increasing degrees of limitations. Soils in classes U-V through U-VII are not suitable for cultivation, but they may be suitable for other uses such as grassland, woodland, or tree crops. Class VIII includes areas which do not produce vegetation of economic importance.

For paddy rice, soils are grouped in five broad groups. Classes P-I through P-IV are suitable for rice with increasing limitations from P-I to P-IV. P-I is very well suited, P-II well suited, P-III moderately suited, and P-IV poorly suited. Soils in class P-V are not suited for paddy rice.

WATER SUPPLY AND PADDY (WETLAND RICE)

Classification of land for paddy must take into account the availability of water, which (apart from irrigated areas) comes from direct rainfall, natural flooding by rise of water in streams, diversion from stream channels, and in places runoff and seepage from adjacent higher land. In addition to the amount, distribution and dependability of the water supply, its salinity and other chemical qualities and the silt load are of great importance.

Availability of water on a specific area may be the most important factor in its classification for paddy. Soil characteristics and topographic position directly influence the utilization of the total amount of water received.

For rainfed paddies an adequate supply of water is in most instances dependent on frequent sufficient rains during the growing season. Exceptions are some areas which although called "rainfed", receive additional water from nearby sources as seepage or runoff. In much of the country, particularly the Northeast, there is likely to be a water shortage. The Central Plain is flooded by rivers each year, and here the likelihood of water shortage is not so great, but there is some damage from excessive flooding in places. The Northern Valleys usually have a dependable supply of water and there is some degree of control through farmer irrigation systems. Here some of the consistently highest yields are obtained.

UPLAND CROPS AND CLIMATE

Climatic zones are not shown on the map, but it is recognized that climate and water supply are fully as important as soil in determining capability of land to produce agricultural crops.

The main part of the Kingdom has a monsoon type of climate, with pronounced wet and dry seasons and total average annual rainfall from about 1000 mm to 2000 mm. The total rainfall is subject to wide variations from year to year as well as from place to place, and in monthly and daily distribution throughout the year.

Distribution of the rainfall and its variation from year to year are of great local importance in producing upland crops without irrigation. Most advantageous planting dates and probabilities of having sufficiently long seasons of adequate rainfall can be calculated for sites having rainfall records of 20 years or more.

Average temperature at all weather stations in the country is more than 18°C in the coldest month, which classifies the climate throughout as Tropical, according to Köppen's classification.

In Peninsular Thailand and in the Southeast, east of Rayong, the climate is more nearly equatorial, with higher rainfall distributed more equally throughout the year. Average annual rainfall totals range from 1700 mm to more than 4000 mm and dry periods are short.

Crop adaptations in the wetter areas differ considerably from those in the rest of the country. Rubber is limited to lands south of the 11th parallel and in the Southeast, mostly east of Rayong along the coast. Cassava is best adapted north of the 9th parallel in areas having more than 1400 mm average annual rainfall. Although sugar cane may be grown throughout the Kingdom, it gives best results at low elevations, north of the 9th parallel and relatively near the coast;

and should have supplemental irrigation in areas of low rainfall. Maize, cotton and other common upland crops need adequate rainfall but also need dry periods without excessive cloudiness in order to mature and allow for harvesting.

INTERPRETIVE LEGEND

The tabulated information given in the legend printed on the map is intended to apply to the predominant conditions of areas indicated, not to all of each area. Within most of the delineations on the map are inclusions of soil conditions which are different from those shown. For this reason it is not possible to assume that an individual field or farm is accurately represented on the map.

Interpretations of the available information to show the most significant land class and preparation of the interpretive legend were by staff members of the Strengthening Soil Survey and Land Classification Project, Food and Agriculture Organization of the United Nations, and the Land Classification Division of the Land Development Department. Representatives of the Agriculture, Rice and Extension Departments gave valuable assistance.

Suggestions of crops which are suitable for increase in each mapping unit are incomplete and tentative. The suitability of any crop for production in an area depends on the degree of agricultural and economic development and the management skills of the farm operators, as well as on conditions of soils and climate.

USE OF MAP INFORMATION

The land capability map will be helpful in pointing out broad areas that have varying degrees of potential, and in which of alternative locations investigations should be made for specific purposes.

It should be emphasized again that the map is small-scale and highly generalized. It has the advantage of presenting a very large amount of information in a single map, so that relations between large areas can be seen readily, but it can be used for such general purposes only. It shows large patterns of soils and related features, but can not show in detail the soil information that is needed for locating and planning specific projects. The map is an important source of information for use in determining those areas in which more detailed and costly investigations are justified. An irrigation project or a new transportation facility, or any other project that leads to important changes in land use, should be preceded by a soil survey at the scale and intensity required to depict the necessary facts.

Following is a brief description of each of the units which are delineated on the map :

AREAS WITH SOILS SUITED FOR PADDY

Map Unit 1. This unit includes a high proportion of land which is very well suited for paddy. It consists mostly of clayey soils on recent marine and fresh-water alluvium, but includes also some areas of soils on somewhat older alluvium in northern valleys. Most of the area is used for one crop of rice a year. Inclusions of relatively small areas of river alluvium which are not subject to flooding are well suited for upland crops in the wet season. Where irrigation water is available soils of this unit are well suited for upland field crops and vegetables in the dry season, except for the marine clay and the wettest areas of river alluvium. Part of the marine clay, however, is permanently in use for horticulture where crops are grown on raised beds with intensive tillage of the soil. Area of the unit is approximately 12,250,000 rai or 3.8% of the total area of the country.

Map Unit 2. Land in this unit is well to moderately well suited for paddy. It includes a variety of soils : (a) poorly drained soils on semi-recent and old alluvium, of moderate to low fertility (Low Humic Gley soils) in most of the country except the Northeast and part of the northern valleys; (b) the less acid of the acid sulphate soils in the Central Plain; and (c) some areas of recent alluvial soils on which the hazard of excess flooding is moderate. Rice is the principal crop. Where irrigation water can be supplied much of the area of Low Humic Gley soils and recent alluvial soils is suitable for some upland field crops and vegetables in the dry season. The acid sulphate soils are not suited for upland field crops. Area of the unit is approximately 25,300,000 rai, or 7.9% of the total area of the country.

Map Unit 3. Land in this unit is moderately to poorly suited for paddy. It includes areas of extremely acid soils (acid sulphate soils) of the Central Plain, as well as soils on old alluvium which are wet in the rainy season (Low Humic Gley soils) and recent alluvial soils, both in the Northeast, which have uncertain water supply and which in the case of some alluvial soils are subject to damaging floods. Rice is the principal crop. Small areas of upland field crops are grown on the recent alluvial soils in the rainy season. When irrigation water is used upland crops can be grown in the dry season in most parts of unit 3, except for the acid sulphate soils in the eastern part of the Central Plain and the Low Humic Gley soils in the extreme northeastern part of the Korat plateau. Area of the unit is approximately 22,500,000 rai, or 7.0% of the country.

AREAS WITH ASSOCIATIONS OF UPLAND AND PADDY SOILS

Map Unit 4. This unit consists of lowland soils used for paddy and adjacent somewhat higher soils used for upland crops, mostly of moderate fertility, derived from semi-recent alluvium. They are closely associated and cannot be separated at the

scale of this map. The poorly drained (Low Humic Gley) soils are nearly all in use for growing rice, while the better drained (Noncalcic Brown) soils are largely used for a wide range of upland crops. Soils of this unit are well suited for cultivation including irrigated crops in the dry season, and both the paddy soils and uplands have good potential for increased production. Area of the unit is approximately 5,500,000 rai, or 1.7% of the country.

Map Unit 5. This unit consists of lowland soils used for paddy and upland soils which are closely associated in areas too small to separate on the map. They are developed on old, strongly weathered and leached alluvium and are low in fertility. In many places they are sandy. The more poorly drained soils (Low Humic Gley) are mostly used for rainfed paddy. Upland soils (Gray Podzolic and Red Yellow Podzolic) are largely used for shifting cultivation. Soils in this unit are only moderately to poorly suited for crops. Nearly all areas of the unit are in the Northeast; improvement of water supplies and fertilization are needed here to increase production. The minor areas in the North and in the Peninsula have more dependable water supply, and are somewhat better suited for crops. Area included in this unit is approximately 50,500,000 rai, or 9.8% of the country.

AREAS WITH SOILS SUITED FOR UPLAND CROPS

Map Unit 6. This unit includes a high proportion of land which is well suited for upland field crops and tree crops. Soils of the unit are mostly moderately fertile, well drained to somewhat poorly drained, loamy and clayey, mostly level to gently sloping, on residuum and colluvium from basic rocks and alluvium derived from these areas. They are members of the Grumusol, Rendzina, Brown Forest, Noncalcic Brown, Red Brown Earth, and Reddish Brown Lateritic Great Soil Groups. Most of the area is now in use, growing a wide variety of upland crops, vegetables and fruit. Area of the unit is approximately 11,500,000 rai or 3.6% of the country.

Map Unit 7. This unit includes a high proportion of land which is moderately to marginally suited for upland field crops. Soils are mostly well drained, sandy to clayey, undulating to steeply rolling, on old alluvium or residuum and colluvium from acid rocks. These are strongly weathered and leached materials and soils are generally low in plant nutrients. They are principally in the Gray Podzolic, Red Yellow Podzolic and Red Yellow Latosol Great Soil Groups. Much of this unit is now in shifting cultivation, with permanent cultivation in the most productive areas. Occurring throughout the Kingdom, this unit includes places climatically adapted to a wide range of crops, for example castor beans in drier areas, cassava in wet areas with a dry season, and rubber in areas with little dry season. Area of the unit is approximately 77,000,000 rai or 24.0% of the country.

AREAS WITH SOILS NOT GENERALLY SUITED FOR CULTIVATED CROPS

Map Unit 8. This unit is generally not suited for cultivated crops except in small areas. It consists mainly of soils in the mountains with steep slopes and

miscellaneous land types, including soils with laterite near the surface. Most of the land is in natural forest, with shifting cultivation in places. Rubber is grown in some parts of the unit in the Peninsula. Small areas in valleys with deep soils on alluvial and colluvial deposits are used for crops. Area of the unit is approximately 129,000,000 rai, or 40.0% of the total area of the country.

Map Unit 9. This unit includes coastal areas which are not now suited for cultivated crops. It consists of beach and dune sand, saline alluvial soils, peat and muck. Some coconut trees are grown on ridged saline alluvial soils; fish, shrimp and salt are also produced, but much of the area remains in natural vegetation of mangrove forest, shrubs, and grasses. Area of the unit is approximately 6,300,000 rai or 2.0% of the total area of the country.

List of Publications by the Soil Survey Division

- x 1. Report on the Preliminary Soil Survey of the Mae Klong Irrigation Project Area. (1962)
- x 2. Report on the Preliminary Soil Survey of the Lam Takong Irrigation Project Area. (1962)
- x 3. Report on the Preliminary Soil Survey of the Tung Sarit Irrigation Project Area. (1962)
- x 4. Report on the Preliminary Soil Survey of the Lam Nam Pong Irrigation Project Area. (1962)
- 5. Report on the Soil Survey of the Huai Si Thon Irrigation Project Area. (1962)
- x 6. Report on the Preliminary Soil Survey of the Greater Chao Phya Irrigation Project Area. (1962)
- 7. Report on the Soil Survey of 10 Villages in Changwat Ubon. (1962)
- 8. Major Soils of South - East Asia. (1966)
- 9. A key to the Soil Survey of North - Eastern Thailand. (1962)
- 10. Report on the Soil Survey of the site of the Proposed Agricultural Centre near Sathani Nam Phong (Khon Kaen Province). (1962)
- 11. Report on the Soil Survey in the Ban Si Than Area (Khon Kaen Province). (1963)
- x 12. Detailed Reconnaissance Soil Survey of the Lam Pao Irrigation Project Area (Kalasin Province). (1963)
- x 13. Report on the Soil Survey of a Pilot Area in Changwat Roi Et. (1963)
- x 14. Detailed Reconnaissance Soil Survey of the Mae Taeng Irrigation Project Area (Chiang Mai Province). (1963)
- x 15. Report on the Soil Survey of the Tha Phra Agricultural Station and surroundings (Khon Kaen Province). (1963)
- x 16. Detailed Reconnaissance Soil Survey of the Lam Phra Phleng Irrigation Project Area (Nakhon Ratchasima Province). (1963)

List of Soil Survey Reports

- 17. Note on the Soil Survey of the Khao Tao Area. (1964)
- 18. Report on the Soil Survey of the Proposed Land Settlement Area at Nam Phong (Khon Kaen Province). (1964)
- 19. Report on the Soil Survey of the Nong Ya Ma Tank-Irrigation Project Area (Roi Et Province). (1964)
- x 20. Note on the Soil and Land Use in the Hills of Tak Province. (1964)
- 21. Reports on the Soil Survey of the Huai Kut Kaen Tank-Irrigation Project Area (Roi Et Province). (1964)

x out of print

- x 22. Report on the Soil Survey of the Kut Daeng Tank-Irrigation Project Area (Roi Et Province). (1964)
- x 23. Report on the Soil Survey of the Thawat Chai Tank-Irrigation Project Area. (1964)
- x 24. Report on the Soil Survey of the Proposed Land Settlement Area at Non Sang (Udon Province). (1964)
- x 25. Report on the Soil Survey of the Land Development Project Area in Kamphaeng Phet Province. (1964)
- x 26. Report on the Soil Survey of the Chiang Pin Land Settlement Project Area (Udon Thani Province). (1964)
- 27. Report on the Thai-Malayan Soil Correlation Meeting, (1964)
- x 28. Interim Reports on the Great Soil Group Survey. I : Khon Kaen Study Area. (1964)
- 29. Report on the Soil Survey in the Sam Roi Yot Area. (Prachuab Khiri Khan Province). (1964)
- 30. Report on the Soil Survey of Roi Et Province. (1966)
- 31. Interim Reports on the Great Soil Group Survey. II : Pran Buri Study Area. (1964)
- x 32. Characteristics of soils on which paddy is grown in relation to their capability classification. (1965)
- x 33. Report on the Survey of the Hup Kapong Development Project Area (Petchaburi Province). (1965)
- 34. Report on the Soil Survey for the Pulpwood Project in Sisaket Province. (1965)
- x 35. Interim Reports on the Great Soil Group Survey : III. Chiang Mai Study Area (1965)
- 36. Survey for a Power Pump Irrigation Demonstration Province in Amphoe Tha Bo, Nong Kai Province. (1965)
- 37. Chao Phya Irrigation Project : II. The Manorom Tract. (1965)
- 38. Interim Reports on the Great Soil Group Survey : IV. Chanthaburi Study Area. (1965)
- 39. Chao Phya Irrigation Project : III. The Boromdhart Tract. (1965)
- 40. Chao Phya Irrigation Project : IV . The Khok Krathiam Tract. (1965)
- 41. Interim Reports on the Great Soil Group Survey :V. Hat Yai Study Area. (1965)
- 42. Chemical and Mineralogical Study of Subsurface Horizons of Chiang Mai. (1965)
- 43. Interim Reports on the Great Soil Group Survey : VI. Nakhon-Sawan Study Area. (1966)
- 44. Interim Reports on the Great Soil Group Survey : VII. Lop Buri Study Area. (1966)
- 45. Report on the Soil Survey in the Pet Buri Irrigation Tract. (1965)
- 46. Soil Series Survey of the MERS Chanthaburi Study Area. (1966)

47. Report on the Soil Survey of the Kud Ling Ngah Tank-Irrigation Area (Udon Thani Province). (1967)
48. Final Report on the Great Soil Group Survey of Seven Selected Areas in Thailand. (1966)
49. Soil Series Survey of the MERS Lop Buri Study Area. (1966)
50. Soil Series Survey of the MERS Chiang Mai Study Area. (1966)
51. Soil Series Survey of the MERS Khon Kaen Study Area. (1966)
52. Soil Series Survey of the MERS Nakhon Sawan Study Area. (1966)
53. Chao Phya Irrigation Project : V. The Maharat Tract. (1966)
54. Chao Phya Irrigation Project : VI. The Pholathep Tract. (1967)
55. A Detailed Soil Survey of the Rubber Research Centre, Hat Yai. (1967)
56. Report on the Soil Survey in the Nong Chang Yai Tank-Irrigation Area (Ubon Province). (1967)
57. Chao Phya Irrigation Project : VII. The Chong Kae Tract. (1967)
58. Reconnaissance Soil Survey of Rubber Growing Areas in Thailand, Chanthaburi Area. (1967)
- x 59. Soil Survey Interpretation Handbook for Northeast Thailand. Part I : Soil and Their Uses. (1967)
60. Soil Survey Interpretation Handbook for Northeast Thailand. Part II : Land Capability Classification. (1967)
61. Chao Phya Irrigation Project : VIII. The Channasut Tract. (1967)
62. Reconnaissance Soil Survey of Rubber Growing Areas in Thailand, Songkhla Area. (1967)
63. Reconnaissance Soil Survey of Rubber Growing Areas in Thailand, Trang Area. (1968)
64. Reconnaissance Soil Survey of Rubber Growing Areas in Thailand, Phanga Area. (1968)
65. Reconnaissance Soil Survey of Rubber Growing Areas in Thailand, Ranong Area (1968)
66. Chao Phya Irrigation Project : IX. The Yang Mani Tract. (1968)
67. Reconnaissance Soil Survey of Rubber Growing Areas in Thailand, Chumphon Area. (1968)
- xx68. Reconnaissance Soil Survey of Rubber Growing Areas in Thailand, Surat Thani Area.
69. Chao Phya Irrigation Project : X. The Tha Bot Tract. (1969)
70. Reconnaissance Soil Survey of Rubber Growing Areas in Thailand, Nakhon Si Thammarat Area. (1968)
71. Report on the Detailed Soil Survey in the Channasut Land Consolidation Project Area. (1968)
72. Soils of Thailand. (1968)

x out of print
 xx in preparation

73. Detailed Soil Survey of the North-Eastern portion of ASRCT Sakaerat Experiment Station (Nakhon Ratchasima Province). (1969)
74. Transfer of Boundaries From Air-Photo onto Base Map. (1969)
75. Soil Suitability Survey of Teacher Training School, Changwat Sakon Nakhon. (1969)
76. General Land Suitability for Crop Diversification in Peninsular Thailand. (1969)
77. Soil Survey of Ubon.
78. Soil Survey Interpretation Report for Ubon Province. (1969)
(Land Classification Division Report No. 3)
79. Notes on Soil Temperature Regimes in Thailand. (1969)
80. Guide for writing Province Soil Survey Reports. (1969)
81. Acid Sulphate Soils in Thailand. (1969)
82. Detailed Soil Survey and Land Classification in the Kui Buri River Valley (1969)
83. Air-photos and Air-photo Interpretation in Soil Survey. (1970)
84. Some Morphological Physical and Chemical Aspects of Acid Sulphate Soils in Thailand.
85. Method and Procedure by Photo-Interpretation for Survey of Rubber Plantations in Thailand.
86. Detailed Reconnaissance Soil Survey of the Northern Part of Chiang Rai Province (1972).
87. Semi- Detailed Soil Survey of a part of the Central Plain
Pho Phraya, Sam Chuk and Sam Chuk-extension Irrigation Tracts.
88. Semi-Detailed Soil Survey of a part of the Central Plain Rerng Rang, Nakhon
Luang, Maharat-Extension and Phak Hai Irrigation Tracts.
89. Detailed Reconnaissance Soil Survey of the Southern Part of the Central
Plain.
90. Detailed Reconnaissance Soil Survey of NAN Province.

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