Topographical Control Over the Agriculture in the Mae Nam Delta

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In the middle and lower reaches of the Chao Phraya river of Thailand spreads a flat lying spacious land which is called customarily the Mae Nam delta. This land, however, is not so simple as it has been considered up to now. The recent geomorphological studies by the author[4] revealed that the plain can be divided into some topographic units and that the various human activities are controlled by topographic characteristics. This report presents some cases of topographical control over the agricultural activities.

Topographic classification of Mae Nam Delta

Fig. 1 is a contour map prepared on the basis of an existing topographical map of 1 : 50,000. Fig. 2 is a topographic unit map drawn with geomorphological considerations on Fig. 1. Four units and three subunits are shown in the figure as follows;

Singburi plain
Ban Phraek trough
Bangkok lowland
  Old barrier island area
  Old lagoon area
  Coastal area
Marginal zone

The Singburi plain is a Pleistocene terrace. The Ban Phraek trough is an old valley, approximately 20,000 years old, engraved in the Singburi plain. An interesting fact is that the valley is a trough coincident with none of the existing rivers. The Bangkok lowland is the youngest plain which is thought to have risen from the Gulf of Thailand during the past thousands of years. The Old lagoon area and the Old barrier island area can be considered as the former shoaling beach and barrier island which have existed in this gulf.

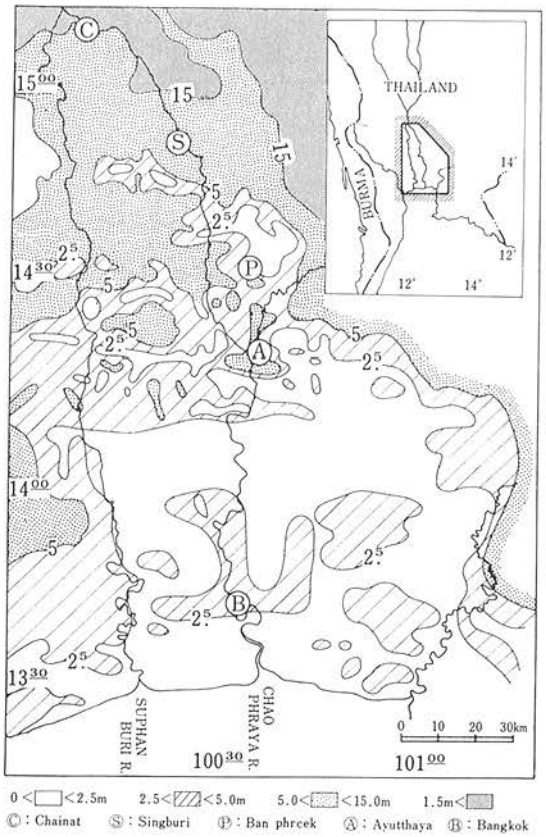

Fig. 1. Contour map of the Southern basin of the central plain.

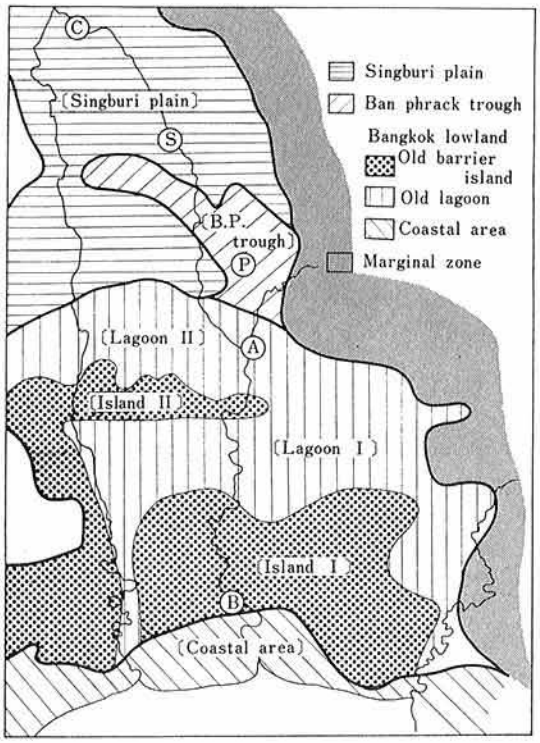

Fig. 2. Map showing topographic units.

The Coastal area is a present sea-facing area of which a part is even now covered with mangrove and nipa. The Marginal zone is a hilly country surrounding the delta area. The characteristics of each topographic unit are shown in Table 1.

Examples of topographical control

1) Rice and floating rice

The distribution of directly sown paddy fields and transplanted paddy fields is shown in Fig. 3.[2] This distribution may be thought to be under the topographical control. In the Bangkok lowland, the Old barrier island I has transplanted paddy fields predominantly, whereas the Old lagoon area has rather more directly sown paddy fields. It may be said that on the whole the directly sown paddy fields are distributed in low lying parts such as the Trough and the Lagoon areas, and the transplanted paddy fields are in the elevated parts like the Old barrier islands.

2) Canal system

Canal system is shown in Fig. 4.[1] Irriga-

Table 1. Topographic units and their characters

Criteria \ Topo-units		Bangkok lowland			Ban Phraek trough	Singburi plan	Marginal zone
		Coastal area	Old lagoon area	Old barrier island area			
Topography	relief	flat	flat, lowlying	flat, elevated	slightly undulating, lowlying	slightly undlating	slightly undulating to rolling
	geomorphology	coastal area	old lagoon	old barrier island	old river basin	pleistocene terrace	terraces and hills
	vegetation	mangrove paddy	paddy	paddy with palmyra palm	paddy	paddy with standing trees	paddy and bushes
Water	river density	small	small	small	large	medium	medium
	river pattern	estualine	tidal rivers	tidal rivers	braided streams and swamps	meander with ox-bow lakes	streams
	accesibility	inundated	well watered	not so well watered	long inundated	poorly watered	poor watered
Lithology	texture	clayey	clayey	sandy to clayey	sandy to clayey	sandy (levee) clayey (back swamp)	sandy to clayey
	weathering	fresh	fresh	fresh	fresh	weathered	weathered

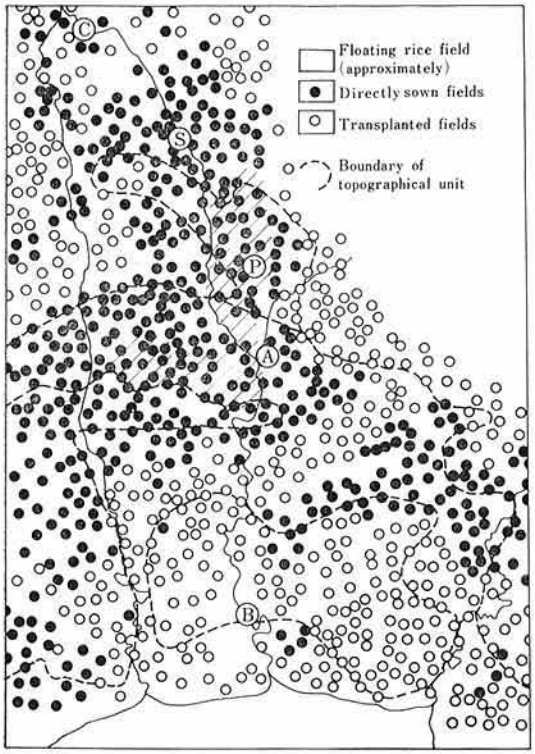

Fig. 3. Map showing the distribution of floating rice field, directly sown and transplanted paddy fields.
(cited from Fukui and Takahashi, 1969)

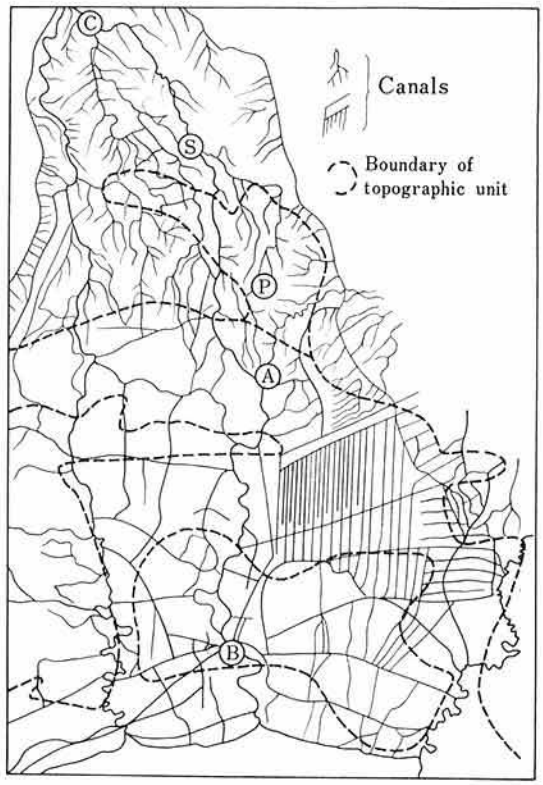

Fig. 4. Map showing canal system.

tion canal system is strictly confined to the area of the Singburi plain plus the Ban Phraek trough. On the other hand transportation canal system is markedly developed in the Bangkok lowland. In the former, the water is bound in river channels owing to the well developed natural levees and is not distributed to farms behind the levees, thus the water distribution system is required to be perfect for agriculture. In the latter, due to lower levels and even topography the water flows naturally in the form of sheet flow and is possible to maintain the quantity for a long period of time. This has promoted the development of the transportation canal system to harness the water.

3) Average area of cultivated land

Fig. 5 is a map showing the average area of cultivated land per farm-house, calculated in each district, based on the census in 1963[3]. From the figure two things can be made clear. First, the Singburi plain is characterized by the medium grade of farm area, and the dispersion of the grade is small here. Second, in the Bangkok lowland the area varies greatly from largest to smallest, having minutely divided land concentrated in the Old barrier island I and large mesh in the Old lagoon area. This would be understandable when we pay regard to the history of the reclamation. The Singburi plain has been developed and owned by farmers of modest sized holding. By contrast, the Bangkok lowland had been neglected for a long time for its swampy environment and was only recently occupied by people; its Old barrier island area, especially the area along big river courses, as shopping centers and the Old lagoon area as rice plantations.

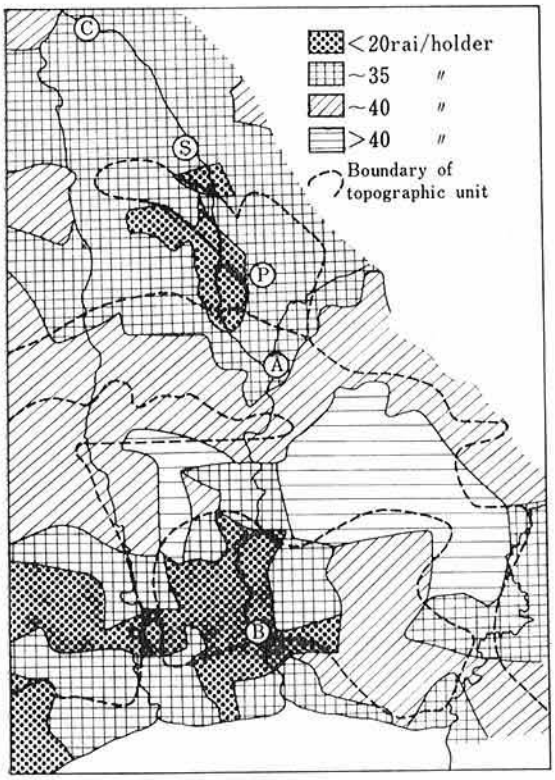

Fig. 5. Map showing the distribution of average of cultivated land.

Acknowledgements

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