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RESEARCH ON THE TRANSFORMATIONS AND DIFFERENTIATION OF REGIONAL AGRARIAN SYSTEMS:

A macro analysis complementary to Farming Systems Research and Development¹

การวิจัยด้านการเปลี่ยนแปลงและการแปลงสภาพของระบบเกษตรในภูมิภาค :

การวิเคราะห์ระดับมหภาคที่เสริมการวิจัยและพัฒนาระบบการทำฟาร์ม

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Abstract

If agricultural development is considered as the gradual changes occurring in the agricultural production processes that are assumed to be socially beneficial, the knowledge of these processes, their transformations in time as well as spatial adaptations is of primary importance. Especially because such a knowledge should be at the basis of any critical consideration or recommendation for action aiming at modifying the existing production processes and the on-going course of their changes in a given area.

In FSRD, well-known concepts of the micro analysis are successfully used to understand, evaluate and improve these production processes at the farm level. Meanwhile, at a larger scale and in order to identify the deep key transformations that affect in the long term the whole farms of a region, these useful concepts are not sufficient. Particularly, they do not permit the appraisal of the conditions and consequences of these determining evolutions and adaptations, especially their economic and social implications.

To characterize such significant changes in the production processes at the regional or national levels, a more global concept is necessary that we call Agrarian System. At the crossroads between agro-ecology and agro-economy, the concept's main variables are the cultivated ecosystem and the instruments and means which are used to produce, maintain and exploit it, creating a specific mode of exploitation of the environment. Other essential interrelated variables that have also to be taken into account to explain the key transformations of agrarian systems are the division of labor between the various economic sectors, the relations of production, ownership and exchanges of the products, as well as the dominating political and cultural conditions and institutions.

The paper presents how such a global concept can be used to:

- propose a pertinent diagnosis on the present state and on-going evolution of a regional agriculture.
- formulate adapted orientations for its future development, especially for the less-favoured groups of farmers.

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Recent studies on key changes in the rice-based agrarian systems of southern Thailand provide illustrations and concrete examples as well as demonstrate the relevance of this approach in the present state of Thai agriculture.

It is also suggested that such study of the historical transformations and spatial adaptations of the agricultural production processes constitutes the subject of an agricultural development science understood as a part of the global social development.

บทคัดย่อ

ถ้าเราจะพิจารณาว่าการพัฒนาด้านการเกษตร เป็นการเปลี่ยนแปลงอย่างค่อยเป็นค่อยไปของขบวนการผลิตทางการเกษตรที่เป็นประโยชน์ต่อสังคมแล้ว สิ่งที่มีความสำคัญมากก็คือวิทยาการความรู้ของขบวนการเหล่านี้ รวมทั้งการแปรเปลี่ยนไปตามกาลเวลา และการปรับตัว ทั้งนี้เพราะวิทยาการความรู้นั้นควรจะเป็นรากฐานของการพิจารณา หรือการให้คำแนะนำของข้อปฏิบัติที่มุ่งจะปรับเปลี่ยนขบวนการที่มีอยู่เดิม รวมทั้งแนวทางของการเปลี่ยนแปลงด้วย

ในการวิจัยและพัฒนาระบบการทำฟาร์มนั้น ได้มีการใช้แนวคิดของการวิเคราะห์ระดับจุลภาค เพื่อช่วยเสริมสร้างความเข้าใจ ช่วยประเมินและปรับปรุงขบวนการผลิตในระดับไร่นา แต่ในระดับที่กว้างขึ้นไปนั้น เพื่อที่จะสามารถกำหนดการเปลี่ยนแปลงหลัก ๆ ที่มีผลกระทบระยะยาวต่อฟาร์มโดยส่วนรวมของภูมิภาคนั้น แนวคิดดังกล่าวไม่เพียงพอ ทั้งนี้เนื่องจากแนวคิดดังกล่าวไม่เอื้อต่อการประเมินสภาพและผลที่ตามมาของวิวัฒนาการและการปรับตัว โดยเฉพาะในส่วนที่มีผลต่อสังคมและเศรษฐกิจ

ดังนั้นในการที่จะเข้าใจการเปลี่ยนที่สำคัญในขบวนการผลิตทั้งที่ระดับภูมิภาคและระดับประเทศ เราจำเป็นต้องอาศัยแนวคิดครอบคลุมกว้าง ๆ ที่เรียกกันว่าระบบอะเกรเรียน หรือระบบเกษตร (Agrarian System) เพื่อให้ครอบคลุมทั้งด้านนิเวศเกษตร (agro-ecology) และเศรษฐศาสตร์เกษตร (agro-economy) แนวคิดนี้มีตัวแปรที่สำคัญได้แก่ ระบบนิเวศที่ได้รับการไถพรวน อุปกรณ์และวิธีการที่ใช้ในการผลิตบำรุง และ ใช้ระบบนิเวศให้เกิดประโยชน์ ทั้งนี้เพื่อก่อให้เกิดรูปแบบเฉพาะของการใช้ประโยชน์จากระบบนิเวศนั้น ตัวแปรอื่น ๆ ที่เกี่ยวข้องและจำเป็นในการทำความเข้าใจการเปลี่ยนแปลงหลัก ๆ ของระบบเกษตร ได้แก่ การแบ่งแรงงานระหว่างส่วนต่าง ๆ ในระบบเศรษฐกิจ ความสัมพันธ์ระหว่าง การผลิต การเป็นเจ้าของ และการแลกเปลี่ยนผลิตผล รวมไปถึงอิทธิพลจากการเมือง ขนบธรรมเนียมประเพณีและสถาบันที่เกี่ยวข้อง

รายงานนี้จะเสนอแนวทางในการนำแนวคิดแบบครอบจักรวาล (global concept) ไปใช้ในการ :

- เสนอแนะข้อวินิจฉัยสถานการณ์ปัจจุบันและวิวัฒนาการของการเกษตรในส่วนภูมิภาค
- กำหนดรูปแบบการแนะแนวทางการพัฒนาในอนาคต โดยเฉพาะอย่างยิ่งสำหรับเกษตรกลุ่มที่ได้รับ

รับความสนใจน้อย

เมื่อเร็ว ๆ นี้ ได้มีการศึกษาการเปลี่ยนแปลงหลัก ๆ ของระบบเกษตรที่อาศัยข้าวเป็นหลักที่ตอนใต้ของประเทศไทย ซึ่งเป็นตัวอย่างที่ดีของการใช้แนวคิดดังกล่าวว่าเหมาะสมกับสภาพปัจจุบันของการเกษตรในประเทศไทยอย่างไร

นอกจากนี้ยังได้มีการเสนอว่า แนวทางการศึกษาดังกล่าวที่เน้นการเปลี่ยนแปลงในประวัติศาสตร์และการปรับตัวในสภาพพื้นที่ต่าง ๆ ของขบวนการผลิตทางการเกษตร ควรจะเป็นส่วนสำคัญในหัวข้อการศึกษาด้านการพัฒนาทางการเกษตร อันจะช่วยให้เข้าใจการพัฒนาทางสังคมในส่วนรวมด้วย

INTRODUCTION : The need for a macro analysis complementary to FSRD.

Agricultural Development can be considered as the gradual changes occurring in the agricultural production processes that are assumed to be socially beneficial. Such changes aim at improving the cultivated environment, tools, crops varieties and breeds of domestic animals, as well as to satisfy the changing social needs. Thus, a precise knowledge of these processes of agricultural production, of their transformations in time as well as spatial variations, adaptations or differentiation, is of primary importance. Furthermore, a pertinent understanding of the existing conditions of these transformations and variations should be at the basis of any critical consideration or recommendation for action aiming at modifying the existing agricultural production processes and the on-going course of their changes in a given area.

Classically, in Farming Systems Research and Development (FSRD), the analysis of the production processes and their variations is carried out by using well known concepts belonging to agronomy, animal science or agricultural economics, such as the elementary cultural practice, itinerary of techniques, cropping and animal raising systems, farming or agricultural production systems. These concepts can be successfully used to characterize, understand and evaluate the production processes at farm level, as well as to formulate adapted propositions for desirable and possible changes at short and medium terms, in order to improve and optimize the farmers' existing systems. Thus, these concepts are absolutely necessary for the study and practice of development-oriented research in agriculture, but all of them are of a micro analytical or micro economic nature.

That is why these concepts are not sufficient if one is trying to identify, characterize and appraise the deep upheavals that, at a large scale (from the farm to the world agro-industrial complex) and in the long term affect the whole farms, or a dominating group of them, of a region or a country. Such qualitative changes modify either the cultivated ecosystem or the means of production, and so also its mode of exploitation : changes from slash and burn forest cultivation to permanent agriculture, from self-subsistence rice-based systems to cash crops-dominated systems, from rainfed lowland rice production to irrigated multiple cropping systems,¹ etc...to name a few of such important changes that have affected, during the last fifty years, the agricultural production processes of Songkhla lagoon basin area. Particularly, these micro analytical concepts do not permit the understanding of the whole conditions and consequences of such important historical transformations and geographic adaptations, especially their economic and social implications : what kind of evolution of labor productivity, as compared with the other competing areas or countries for the same products? What degree of social differentiation among the farmers in the area? To achieve that, a macro analysis is needed.

I. WHAT KIND OF MACRO ANALYSIS? The need for a more global concept.

Broadly, in order to discern and understand the significance of these most important transformations and regional adaptations of the agricultural production processes as well as the existing conditions and consequences that they imply, such a macro analysis has to be able to:

1. Distinguish and characterize the main changes of state of the agricultural production processes in the given area over time.
2. Identify the origin and follow up the development of any "new agricultural order", while monitoring the recession of the ancient organization of agriculture it is replacing.
3. Determine the existing conditions for such a change: particularly the economic, political and socio-cultural conditions at that time which permit, accelerate or slowdown such a change.
4. On the other hand, discern the obstacles and restraining factors which forbid or hamper the change towards the new agricultural order.

So-defined, such a macro analysis of the changes that are affecting the agricultural production processes can be considered as the subject of a science of agricultural development understood as a part of the general social development.

In order to carry out such a macro analysis it is obviously necessary to get as rich as possible a knowledge of the local agrarian history and geography, but also a good understanding of the to-day real situation of the world agriculture and especially its contradictory movements (accumulation, development in some parts and degradation, crisis, destruction of agriculture in other areas).

But this is not enough. To build such a scientific field, it is also necessary to have at hand a rigorously defined global concept, which can be developed into a theory in order:

- to explain the historical changes of state and geographic adaptations of the agricultural production processes.

- to be able to distinguish and characterize these key states and discern the conditions for their emergence, development or disappearance.

- to discover the conditions of their chaining into an evolutionary sequence of agricultural transitions-transformations which regulates the succession of the key steps followed by the production processes.

Beyond the internal structure of the concept and its functioning rules, it should also be clearly articulated with the external conditions of its existence and transformation. This is the concept of Agrarian System (A.S.) as defined by Professor Marcel MAZOYER: "an historically constituted and durable mode of exploitation of the environment, a technical system adapted to the bioclimatic conditions of a given area and which complies with its social conditions and needs at that moment" (MAZOYER, 1985).

It is suggested that such global concept and the subsequent theory of "Historical Evolution and Geographical Differentiation of Agrarian Systems" (MAZOYER, 1978) can provide a scientific basis for the rational elaboration of agricultural development projects, plans and policies. It provides the basis to generate in an organized way the knowledge which allows an understanding of a given agriculture : how is it made (its "anatomy", structure), how is it functioning (its "physiology", rules), how is it evolving (its growth, development, but also eventual stagnation, recession, crisis or destruction). Whatever the diversity of the methods and fields of knowledge that will be necessary to implement them, the pertinence and the efficiency of the diagnoses, orientations, choices of ways and means for project implementation, finally depend on this basically different domain which are the production processes themselves, their transformation-adaptation and their social conditions and consequences.

II. THE GLOBAL CONCEPT OF AGRARIAN SYSTEM : its variables and application.

2.1 The concept's interrelated variables.

The concept of agrarian system can be defined as a combination of the following essential and interrelated variables:

- the cultivated environment : the original environment and the historical transformations which it has undergone.

- the instruments of production : tools, machines, crop varieties, breeds of livestock and the (physical as well as intellectual) labour which uses them to produce, maintain, exploit the cultivated environment. A coherent tooling system to grow the selected crops and raise animals which are themselves compatible with the kind of environment. A technical system to cultivate this environment but which is also necessary and sufficient to maintain its conditions of production (soil fertility, land development techniques and infrastructures such as canals, etc...).

– the resulting mode of exploitation of the environment : the product of the agricultural work, using an adapted combination of inert and living means of production to maintain and exploit the cultivated environment in distinct but complementary sub-systems. But such internal coherence of the mode of exploitation itself refers to the technical, economic and social conditions of production at a larger scale.

– the division of labour among agriculture, crafts and industry which provides for the replacement of tools and equipment and, as a result, for the agricultural surplus beyond the needs of the agricultural producers which supports the other social groups. A specific division of labour corresponds to the state of the forces of production; it is not the same for manual, draught animal or motorized cultivation.

– the relations of exchanges between these associated economic sectors, the ownership and power relationships which regulate the distribution of the fruits of labour (production and consumption goods) and the relations of exchanges between systems (competition).

– finally, the collection of ideas and institutions which are necessary for society to continue : relations of production and exchanges, distribution of the products (MAZOYER, 1985).

The possibility or not for a given mode of exploitation of the environment to develop itself, and therefore its existing conditions, depend on these relations of ownership, production, exchanges and general social relations. For examples, family smallholdings of the rainfed lowland area of Sathing Phra peninsula are difficult to mechanize (only some 10 to 25% of the farmers according to the villages own a hand-tractor and very few of them a small thresher); while on the west side of the lagoon, the past expansion of the world car industry and related growth in the transnational relation of exchanges drove back the slash and burn upland rice cultivation in the forested areas and direct the specialization towards the more competitive rubber production.

2.2 Application of the concept of Agrarian System.

The agrarian system is a complex theoretical object, at the crossroads between agro-ecology and agro-economy. It is affected by changes in the long term (decade, century) that can be understood as changes from a former agrarian system to a new one through an "agricultural revolution". Thus, the transformations of agriculture in a given region can be depicted, understood and explained through an evolutionary series of agrarian systems (Figure 1).

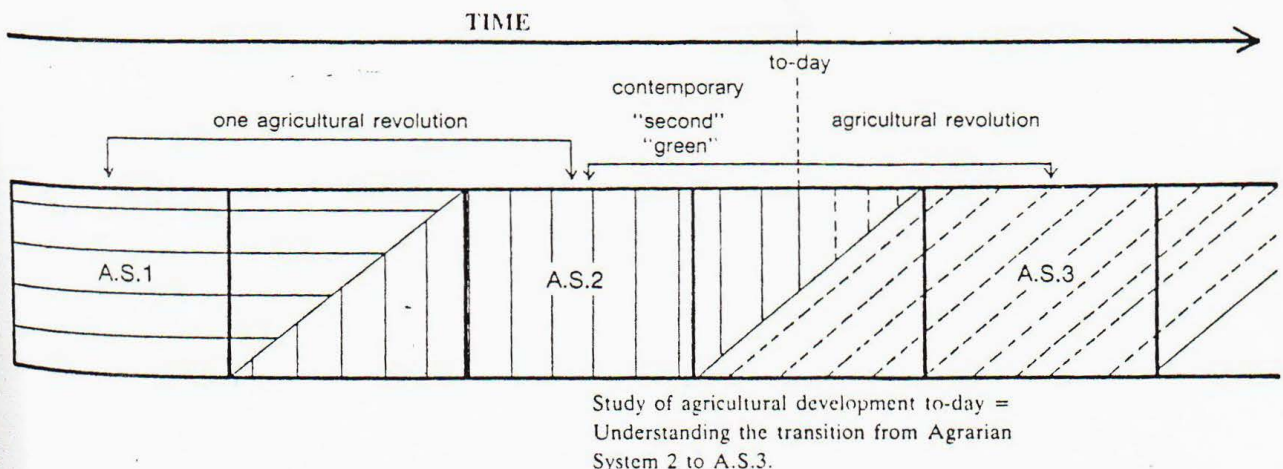
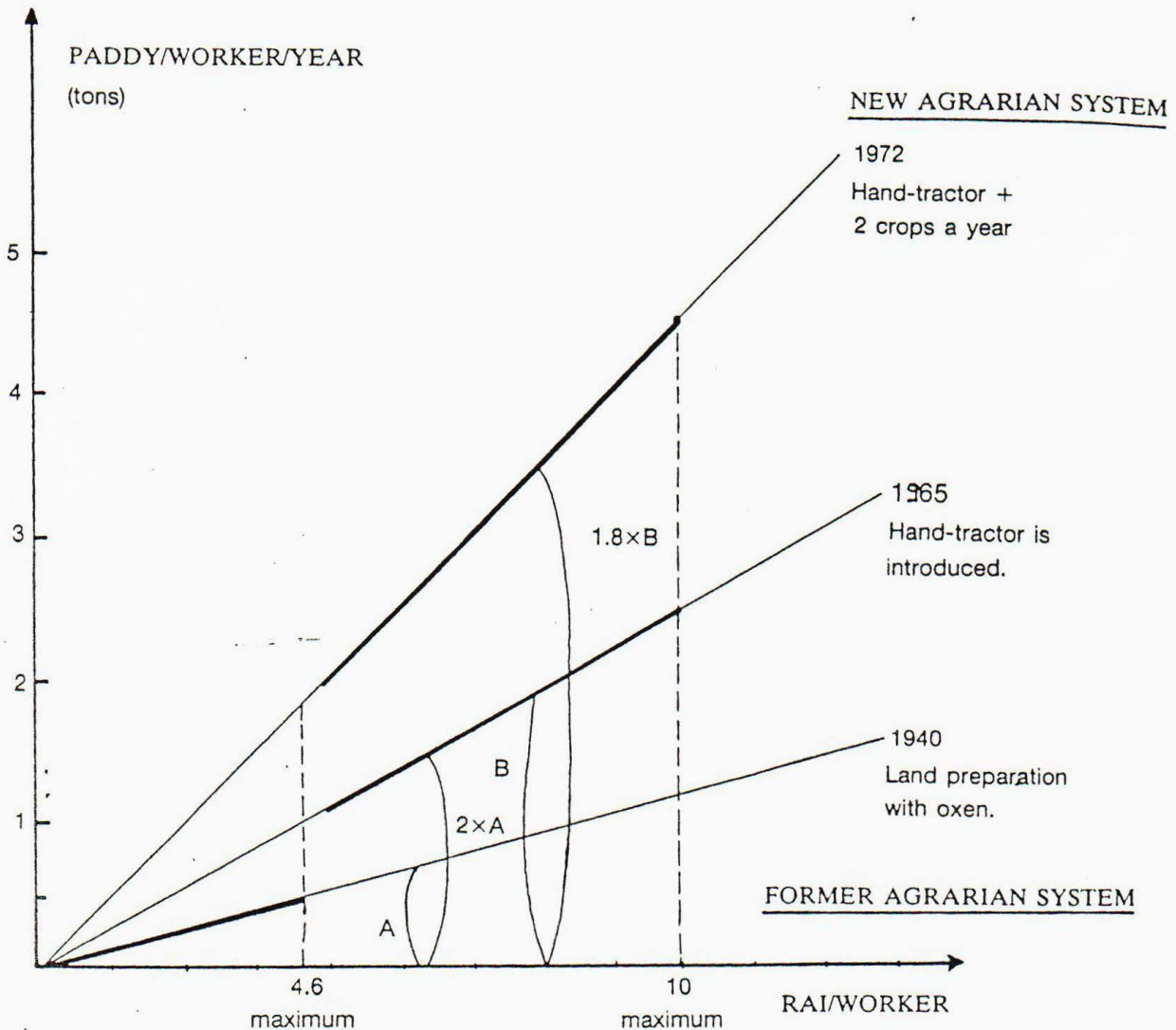


Figure 1. A theoretical representation of the evolution of a regional agriculture.



Source : BAERT and BERGEZ, 1987.

Figure 2. EVOLUTION OF LABOR PRODUCTIVITY IN RICE IN A VILLAGE OF PHATHALUNG PROVINCE.

Any agrarian system, any mode of exploitation of the environment has a limited capacity for agricultural production. As long as such limit is not reached, agricultural development can consist in expanding the present system, in making full use of its specific means of production and refining them on the whole area that can be cultivated. As soon as the limit capacity is reached, it is considered that agricultural development cannot be pursued without a change of agrarian system, what Pr. MAZOYER calls an "agricultural revolution". Such a change implies an important transformation in the quality or nature of the production processes, i.e. a new technical system, another source of energy in agriculture, another mode of artificialization of the ecosystem, a higher level of labor productivity, etc. This is illustrated in Figure 2 in the case of the transition from traditional rainfed lowland rice cultivation with oxen, to the current expanding motorized and irrigated new agrarian system in Phthalung area (For more information about the pertinence of such a graph, see MAZOYER, 1981).

In both cases, expansion of a pre-existing agrarian system or establishment of a new one, but mainly in the second situation, it is assumed that the improvement of the process of production presupposes previous changes in the relations of production and exchanges, as well as in the institution

and ideas that are dominating, regulating the old agrarian system and could hamper the gradual development of new one. To continue with the same example as above, such important changes in the local rice production systems have been preceded by the opening of Phathalung region to the market economy, especially through road construction in the fifties and sixties, as well as the creation of administrative units for irrigation (since 1952), the delivery of land titles, rice research (since 1954, with the first recommended variety released in 1962) as well as formal agricultural credit institutions.

Now we can see how such a theoretical basis can be used to interpret the present evolution of the agricultural production processes.

III. APPLICATION OF THIS APPROACH : its relevance to the current situation of Thai agriculture.

3.1 The contradictory process of "development-elimination" among the farmers during the spreading of the contemporary agricultural revolution.

To-day world agriculture is made of blocs which can be distinguished by their specific agrarian inheritance-the product of a particular historical evolution and geographical adaptation-and their recent transformations. The latter are resulting from a more or less complete and contradictory grafting of the techniques and means of production belonging to the contemporary ("second" or "green") agricultural revolution (motorization, mechanization, use of chemicals, breeding, regional specialization), or any other agricultural revolution (draught animal agriculture, irrigation,...) that permits an increase in productivity of the production units which can afford to secure them (see Figure 2 in the case of simple motorization of rice production).

Generally, these on-going transformations can be understood as a transition between a former, "initial", agrarian system inherited from the past, and a new, "final" agrarian system to come, which is under formation and is the product of the adoption of these new means (Figure 1).

Such "spontaneous" transformation, which is resulting from very powerful economic forces at work, can be facilitated or accelerated by technical, economic or socio-political measures; but it could also be opposed by these measures or policies when they are not adapted or contradict the conditions of development of some group of farmers.

Indeed, the new means of production which are specific to any agricultural revolution are costly and only benefit those production units which can afford them. Their acquisition is made along a contradictory process of "development-crisis" or "development-elimination" among the farmers, which is repeating itself for a decreasing number of producers. In all the countries, including the old industrialised ones, where the transformations of agriculture occurred far more gradually, the contemporary agricultural revolution led to the marginalisation and elimination of a growing number of production units (For example in France, the number of farmers in the country decreased from some six million at the beginning of this century to 900,000 now, and perhaps only one half of them will be able to continue in year 2,000). Meanwhile in these countries the labor force regularly drained over decades through such agricultural exodus could be incorporated into the expanding secondary and tertiary sectors. But this is a scenario which cannot be repeated nowadays, mainly because of the unification of the world economy.

3.2 Relevance to the current situation of Thai agriculture.

In developing countries, these changes are occurring more rapidly, and here also a majority of the production units are not able to adopt the whole set of means of the second agricultural revolution. These farms are adopting only a part of them, the more accessible and less costly or risky ones, or not any at all! Thus, in Sathing Phra rainfed rice growing area, eventhough almost

all the farmers apply (but at very low rates) chemical fertilizers, only a minority are managing simple motorized systems with hand-tractor and, even less frequently, a small pump and thresher. Almost none of them applies pesticides on rice and the market production of recommended varieties is covering a minor, but increasing (with the diversity of the cultivars available), part of the total paddies. These farmers are being pushed to the margin because of the trend of decreasing in the prices of the agricultural products, which is resulting from the lowering costs of production of the more competitive production units. Such a trend continues as long as they are able to further improve their productivity, either in the country or abroad in the context of a now largely unified world market.

Currently, this price lowering trend due to foreign competition constitutes the main threat to the Thai producers, especially the less-favoured ones. This is because, in the country, the difference of labour productivity among the farmers in a given area is still generally limited. For example, in Sathing Phra area, it varies between 12 and 25 kg of paddy per day of work (as a comparison, the labor productivity gap with the modernized Taiwanese producer is 1 to 10, and even already 1 to 100 between Sathing Phra and Californian producers!). This fact is mainly due to the modalities of introduction of the moto-mechanization of agricultural production in Thailand. Light motorization is predominant and concerns generally only the land preparation, transportation, threshing and pumping practices. So the cultivated area per worker ratio is still limited by crop implantation, transplanting or harvesting, which are still strictly manual operations. Moreover, the farmers who do not possess any instrument for land tillage are able to hire the equipment from the motorized farms.

In Thailand, the differences in labor productivity between areas and farms currently result more from differences in the availability of water and its control, or of "living" capital (herds, plantations), than from farm equipment. But, as it can be seen in the example presented below in Figure 4, the already existing differences are sufficient to generate in the future far more important inequalities as soon as machinery for crop implantation and harvest becomes available. Currently, the development of such more complex moto-mechanization is slowed down by the low cost of labor and the predominance of family small holdings. But such development, associated with the use of more in areas where tenant farming and share-cropping are widespread and could give way to the creation of larger farms after the elimination of the small tenants could make a significant jump forward, and the differences in productivity among the Thai farmers will be far more important. This phenomenon would facilitate the development of some farms and the elimination of others. The question to answer then is: where, when, how, at what rhythm and with what kind of consequences for the existing social structures in the Thai countryside, could such a new step develop itself?

But, because of the non-existence yet of such advanced kinds of moto-mechanization of the agricultural production processes allowing a very significant increase in the cultivated area per worker ration, and perhaps also because of the difficulty to develop them on a short or medium term basis, the threat for the less productive farming systems in the most difficult areas can only come from abroad. As the decrease of the price of rice during the last decade is showing, competition is already real and will only be accentuated in the future. Another key question is then: up to what level and for how long could the types of farmers that are less favoured in land and means of production, and are living in the most difficult and less developed areas resist such competition and avoid an increase in unemployment and rural exodus? This will depend upon the rapidity of the development of more advanced production processes abroad as well as in the country on one hand, and upon the kind of agricultural policy and rural development implemented in Thailand on the other.

The key question for the development of these less favoured production units should be: through what kind of technical, economic, social and political measures can these farms, which are in a state of stagnation or crisis (no maintenance, degradation of their potential of production) be saved? How can start again a cumulative process of increase of their means, productive processes

and economic performances be started again ?

3.3 A renovated look at agricultural plicy issues through an inventory of the differentiated regional situations.

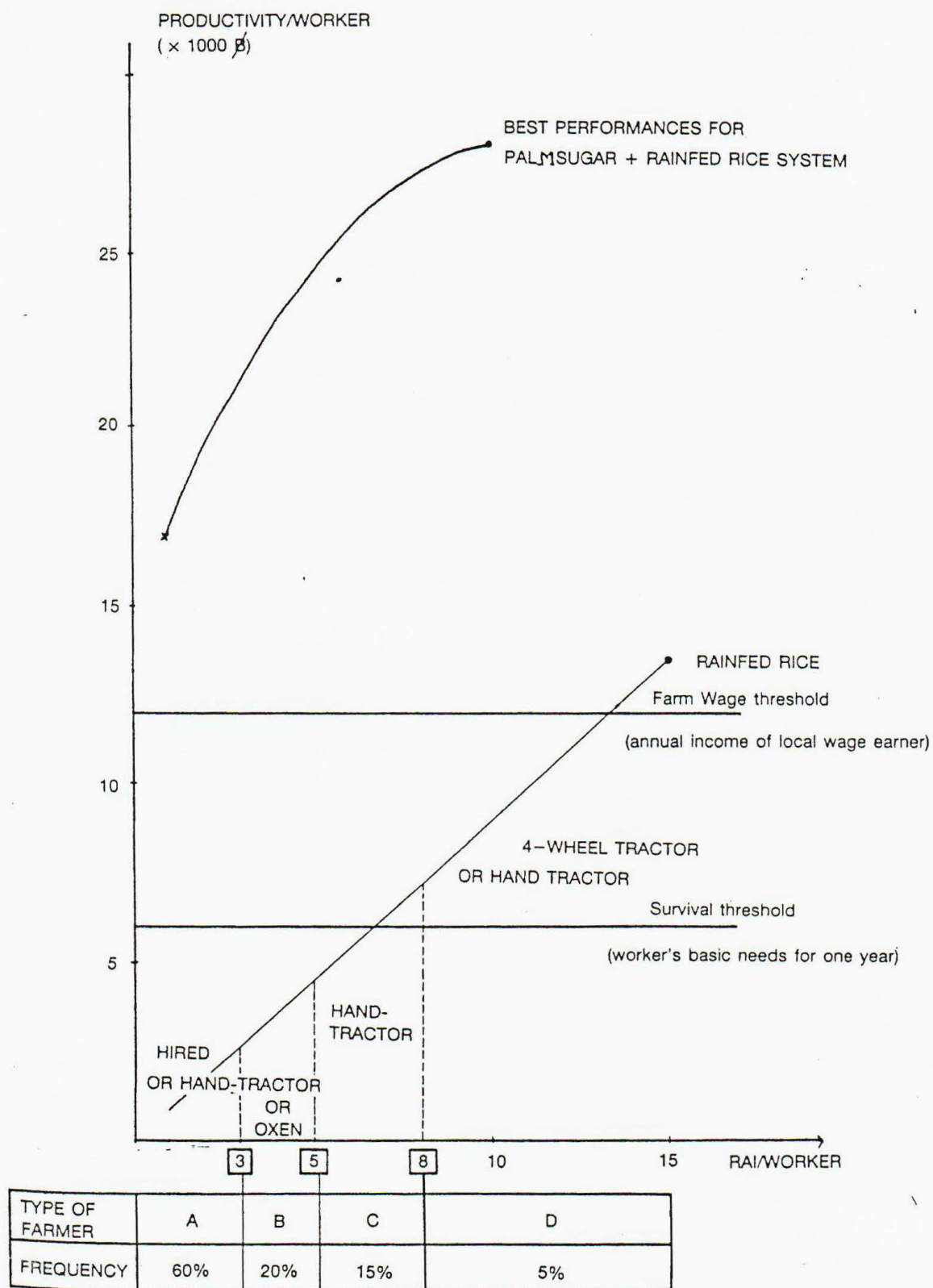


Figure 3 DYNAMICS OF LABOR PRODUCTIVITY IN SATHING PHRA AGRARIAN SYSTEM.

To intervene in such direction, on the present state and the on-going transformations that are considered as not sufficient or negative, so promoting properly speaking the "agricultural development", one has to consider actions at different levels which cover the following aspects:

1. Propositions and actions aimed at the improvement of the technical operations of production, itineraries of techniques, cropping or animal raising systems (agronomy, animal science, etc.).

2. Propositions and actions aimed at the improvement of farming system implemented by the production units (management of the whole system, combination of its sub-systems).

3. Propositions and actions aimed at the improvement of the means of production (tools, machinery, breeds and varieties, etc.) which also imply the design and testing of the corresponding practices, itineraries and systems. (back to points 1 and 2).

4. These new technical means, however, are always costly and their adoption by the production units which do not have them supposes the availability of outside resources for financing them: grants, credit,... (financial means and policy).

5. Meanwhile, the cumulative and self-sustained development of a group of farms which are stagnating or in crisis requires the creation of a sufficient and permanent capacity for self-payment. Such a capacity cannot points 1 and 2, and, later, 3 and 4. The creation of this non existing, or insufficient, capacity for self-payment usually requires the implementation of a new tax and price policy (support for exports, protection against imports). Such a policy, combined with the improvement of the marketing conditions, constitutes very often a prerequisite for the development of these marginal farms to start again (tax and price policy, marketing policy).

For example, a good case of geographic adaptation in the evolution of the rice-based systems of the Songkhla lagoon area is the Sathing Phra peninsula, where the mode of exploitation of the environment is characterized by a close association between rice and sugar palms on the same plot. A high population density (up to 600 inhabitants/km² in some areas), the lack of agricultural land due to the configuration of the peninsula, and bio-physical conditions which do not permit the establishment of rubber plantations but are main reasons for such originality (TREBIL, 1984). Here, the vast majority of small-scale palm sugar producers have been able to continue thanks to the protection of the price of sugar in the country. This factor helps to offset the local very low land/labor ratio on most of the farms, as well as the very low level of labor productivity of this activity when compared to the most competitive sugar produces elsewhere (gross production of 3 kg of sugar per hour in Sathing Phra against more than 400 kg of beet sugar per hour in northern France!). Figure 3 shows that this adapted rice-palm sugar system is presently allowing the survival of most of the farms in the area by providing a level of productivity and net income higher than that which could be expected from local alternative opportunities such as wage earning in agriculture or construction.

6. Finally, stretching and improving the capacity for production of the agricultural land cultivated by the farms in crisis frequently constitutes another preliminary measure for their development: land reform, land development schemes ("farm structures" and land development policies). In Sathing Phra area again, it is clear that only a better water control (drainage during the peak of the monsoon and irrigation during the long pre-humid season) can help the majority of the farmers having less than five rai of land per worker to raise their levels of farm equipment, production capital and labor productivity in rice (see Figure 2).

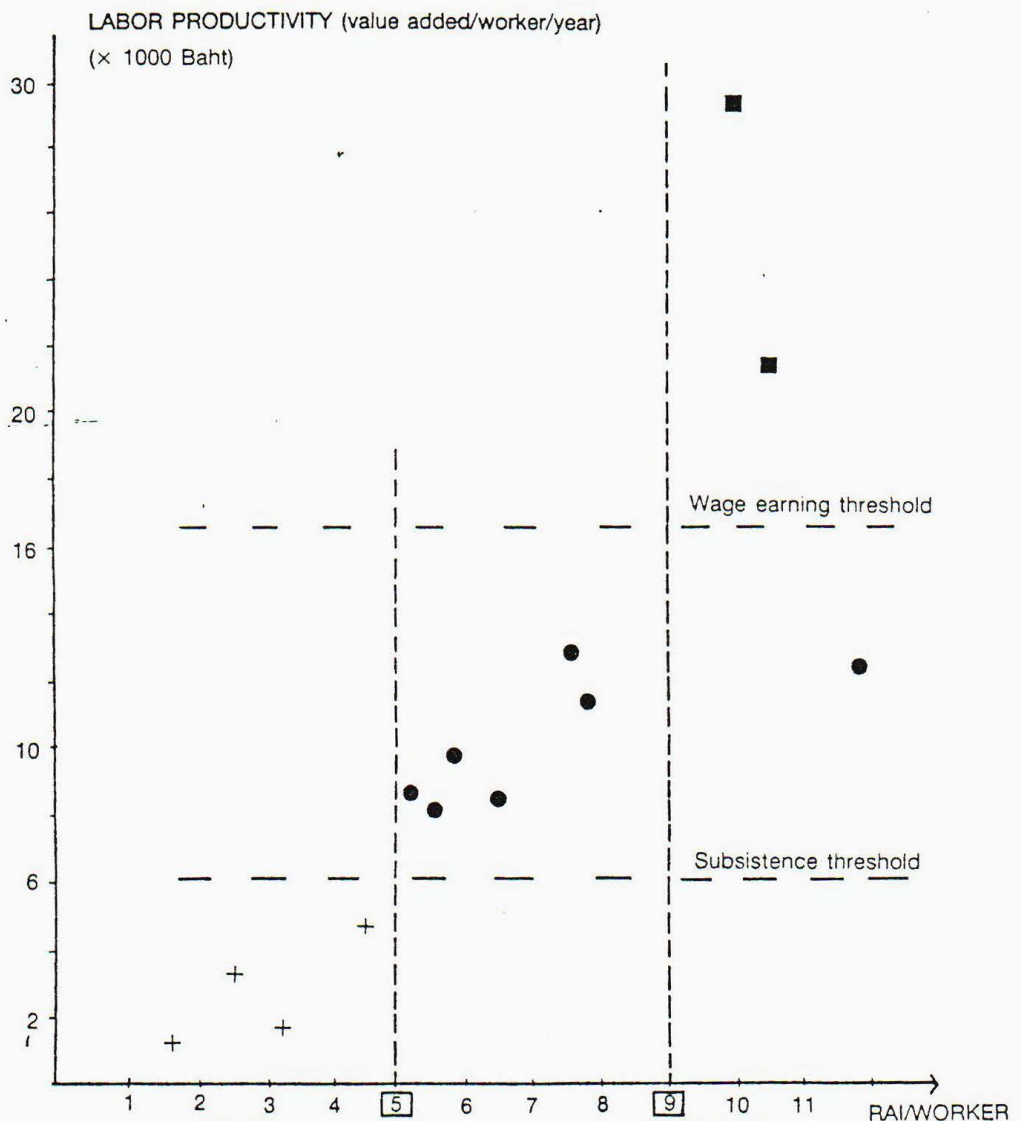
To intervene efficiently on all these aspects in an adapted, coordinated and coherent way requires a clear and pertinent knowledge of the target agriculture and its on-going transformations. In order to get such a picture, it is necessary:

1. To know not only the inherited initial state of the agrarian system and be able to precisely characterize its cultivated ecosystem, means of production and mode of exploitation-maintenance of

the environment, but also the relations of ownership and exchanges as well as the socio-cultural conditions in the frame of which it was functioning.

2. To know and characterize the new components and changes that had occurred at all these levels because of the adoption of new, borrowed or not, means and practices and their economic and social implications. It is also fundamental to be able to discern the incomplete, contradictory and possibly negative aspects of these on-going transformations at each of these levels.

Figure 4 FARMER CLASSIFICATION AND LABOR PRODUCTIVITY IN PHATHALUNG AREA (Source: BAERT and BERGEZ, 1987).



TYPES OF FARMERS	A	B	C
	No activity with high value added.	Less than 2 rai/worker of rubber trees	More than 2 rai/worker of rubber trees.
OBJECTIVES	<ul style="list-style-type: none"> - Gross product maximization - On-time reimbursement of interests 	<ul style="list-style-type: none"> - Maximize annual family income - Accumulation of means of production (rubber land) 	<ul style="list-style-type: none"> - Capital profitability - Higher education for children
FREQUENCY	50 - 70%	20 - 40%	10%

3. In order to get a good judgment of these transformations and to draw up a diagnosis, not only for the present situation, but also a prospective one, it is generally necessary to extend the observed trends in a relatively long term, in order to elucidate more clearly the deficiencies and contradictions of the on-going evolution, as well as to evaluate the redressal to be operated.

4. Having characterized in terms of agrarian systems an initial past situation, a present transitory state and a future non-desirable picture, it is recommended to formulate in the same terms the gradual and accessible objectives that will be pursued by the activities and development policies to be implemented.

5. Regarding these means and policies, they suppose that the conditions and mechanisms which are leading to a non desirable evolution have been perfectly identified and explained. They suppose also that the means to be implemented in order to reach the target objective have been identified, explained and evaluated (adaptation, cost).

This cannot be achieved without a sharp knowledge of the regional agricultural situation and its evolution. Such a regional analysis, or diagnosis, can be carried out by using the methodology of Diagnosis on Agrarian Systems that has already been presented elsewhere (TREBUIL, 1988b). Briefly, this methodology leads to three key outputs which are:

- the agro-ecological zonation, to identify, characterize, and assess the evolution of the mode of artificialization and exploitation of the environment in each of the main agro-ecological units of the region.

- an account of the regional agrarian history, especially to depict the historical movements of labor productivity in the local agricultural production processes implemented by the farmers which are classified into

- a typology of the farmers' existing systems based on their economic objectives, kind of functioning and history (TREBUIL, 1988a).

Figures 2, 3 and 4 that are illustrating this paper present a kind of output obtained after completion of such a diagnosis. The emphasis on the assessment, comparison and evolution of labor productivity in the various agricultural production processes performed by the farmers in the given area is an original aspect of the method. Studies on labor productivity in Thai agriculture are rare or provide only a rough picture at provincial or regional levels (SIAMWALLA, 1987) and do not look at the already quite important differentiation that exists among the farmers' systems. However, the analysis of such differentiation is essential if one is interested by an understanding of the dynamics of the local agriculture; what is the extent of the process of "development-elimination" among the farms? What is the relative position of the various farmers' systems in terms of labor productivity in comparison with the other employment opportunities? What is their respective capacity to resist and increasing outside competition and to continue in the future?

In the case of the rice-based agrarian systems of the southern region, it has been demonstrated that these methods and tools are relevant in order to identify the most threatened groups of farmers and their needs (THUNGWA, 1986, BAERT and BERGEZ 1987, TREBUIL, 1987). Thus, in Figure 4, the threatened group of farmers (type A) is clearly identified and characterized by the productivity of the farming systems performed by the farmers, their objectives which explain the functioning of those systems, the relative size of this group of producers and the agro-ecological units in which they are located (mainly non-irrigated coastal or alluvial lowlands). These studies have also shown that, according to the areas, between one and two thirds of the farming systems did not benefit from any accumulation of means of production during their recent history. This kind of regional diagnosis ends with the design of propositions and means of development which are adapted to both the local agro-ecological situations as well as the economic conditions of the target groups of farmers. In the example described in Figure 4, the recommendations concern the improvement of the

itineraries of techniques performed in dry-seeded broadcast rice production (crop implantation and weed control), the refinement of the crop-livestock association (introduction of dairy cattle and forage production) and the feasibility of an irrigation system in this area.

CONCLUSION

In the present state of Thai agriculture, it seems that regional in-depth studies on the extent and evolution of the process of "development-elimination", or "modernization-crisis" among the farmers are of primary importance. They could lead to a renovation of the agricultural policy by looking at the ways to initiate a cumulative process of increase in means of production and economic performances for the types of farmers in difficulty. By strengthening economic performances for the types of farmers in difficulty. By strengthening their capacity for production, such a policy would boost the growth of the domestic market by adding an important solvent demand from these farmers. Such a solution to an eventual agrarian crisis, that could arise if more and more poor farmers have to leave agriculture and flood the labor market in the near future, appears also to be a good one for the global economy as well which, in such a scenario, will be able to become less dependent on the outside world.

Beyond providing a theoretical framework for such studies, the global concept of Agrarian System and the related theory of the historical evolution and geographic differentiation of the agricultural production processes offer the possibility to generate an agricultural development science on its own.

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