

AGRICULTURAL EXPANSION AND PIONEER SETTLEMENTS IN THE HUMID TROPICS

Edited by Walther Manshard and William B. Morgan



Agricultural Expansion and Pioneer Settlements in the Humid Tropics

*Selected papers presented at a workshop held in Kuala Lumpur,
17–21 September 1985*

Edited by Walther Manshard and William B. Morgan



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This volume contains a selection of papers presented at a workshop, "Resource Use of Frontiers and Pioneer Settlements in the Humid Tropics," held in Kuala Lumpur in September of 1985. The workshop was a contribution to a more general United Nations University programme on resource policy and management in the humid tropics, comprising projects on agro-forestry systems, coastal resource management, highland-lowland interactive systems, and climatic, biotic, and human interactions. Stressing the interaction between population, resources, the environment, and development, this UNU programme and its projects were created with the aim of identifying and fostering appropriate and sustainable resource systems and, more generally, of maintaining at an international level continuing research, training, and dissemination.

Six of the papers included in *Agricultural Expansion and Pioneer Settlements in the Humid Tropics* present the findings of mangrove research undertaken as part of the Coastal Resources Management Project; the other contributions are by invited participants and constitute general reviews or the results of research performed outside the UNU project.

All the studies presented here concern themselves in various ways with spontaneous and planned pioneer settlement in the humid tropics, with its failures as well as its successes, its economic, social, and environmental impact and constraints, and, finally, present a unique composite portrait of the state of the pioneer settlement zone in the humid tropics; it is hoped the present volume may provide guidelines and suggest policies for future colonization and settlement efforts.

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1

Introduction

Walther Manshard and William B. Morgan

In the humid tropics of the third world, increased agricultural production to sustain a growing population, a more urbanized population, and the needs of industry and international trade have long been obtained by areal expansion, that is, by the continual creation of a production frontier. Farmers, particularly young farmers and their families, have moved outwards, seeking new land for both subsistence and commerce, often combining their agricultural activity with hunting, gathering, and timber cutting and frequently acting as the agents of political expansion. Despite many early attempts to intensify agricultural production, this frontier has continued to exist wherever fresh land has been available, often encouraged by extension of the transport network and the lowering of transport costs. There are still extensive areas of relatively empty land in the humid tropics, debatably capable of sustaining agricultural production but whose clearance must reduce the forest resource and involve serious ecological issues.

As early as 1826 it was suggested by Thunen, in his model of land-use rings around an isolated market, that, whilst new developments in agriculture would tend to appear near the centre of the system, simpler forms of subsistence or near-subsistence production, together with the commercial production of certain crops and livestock, would continue on the periphery. In the broad sense in which one may accept that there are certain parallels between Thunen's model and a world system of agriculture, that is generally true today.

Admittedly there are large counter-migrations, particularly where increasing opportunities in the towns for a higher standard of living provide an effective magnet. The frontier is not as attractive as it was. In some countries there are considerable attempts at planned colonization involving settler support, whilst at the same

time, as land near the centres of political power, commerce, and industry becomes more valuable, more and more effort is devoted to agricultural research and production intensification. Both these developments have in certain countries been stimulated recently by economic recession and the recognition of the need to develop more self-sustaining economies. In Brazil, for example, gasohol production from sugar-cane and the advance of agriculture into Amazonia are two aspects of one broad policy. During the 1960s, chiefly from 1965 onwards, intensification of agricultural production in the tropics began at last to have an impact on the global food supply, particularly in the production of high-yielding varieties of rice and wheat in the more densely occupied regions of South and South-East Asia. In India the expansion of the area farmed had all but ceased by 1970, having risen from 115 million ha in 1950 to 178 million ha, then fluctuating at about 180 million ha in the 1980s. Elsewhere the production frontier continued to exist, but no longer as a widespread, more or less continuous phenomenon. In the developing market economies as a whole the farmed areas rose from 2,141 million ha in 1974 to 2,164 million ha in 1983 (FAO 1983), an increase at a rate of only 0.1 per cent per annum. Latin America showed the greatest agricultural expansion of the larger land masses, from 687 million ha in 1974 to 726 million ha in 1983, an increase at a rate of 0.6 per cent per annum. The process is slowing down and even rates of yield increase have tended to fall (see table 1), the only exception amongst major regions in the 1960s and 1970s being the Near East.

TABLE 1. Increases in area cultivated and yield of cereals in major regions of the third world (average percentage per year)

	Area		Yield	
	1961-1970	1970-1979	1961-1970	1970-1979
Developing market economies	1.5	0.9	2.3	1.8
Africa	1.7	0.9	0.8	0.2
Far East	1.4	0.8	3.3	2.1
Latin America	2.4	1.2	1.6	1.4
Near East	1.1	1.2	0.7	2.2

Source: FAO 1980

The production frontier has become regionalized, broken into distinct zones of settlement expansion, each with its own distinctive characteristics. These arise not only from environmental differences within the humid tropics—as, for example, between marginal lands in great river basins such as the Amazon and mountain and plateau fringe zones as in Thailand—but also from differences in the political and production base or core area of each expansion, together with differences in society and economy, which have led to different objectives and the emergence of many different kinds of pioneer settlers, despite the existence of some common features

and trends. Nor should one forget that these relatively empty lands frequently have host populations with extremely varied attitudes to the colonization in their midst.

Local, regional, and national forces are acting alongside a world system of exchange, of political relationships, and of the diffusion of scientific and technical knowledge. The increasing importance of accessibility to commercial and political core areas in the development of the peripheral lands is a major feature of the changing nature of the production frontier. Road building not only opens peripheral regions to planned settlement expansion with commercial opportunity but also creates possibilities for spontaneous settlement, sometimes impossible to control and with unexpected results.

The humid tropics, defined as that part of the tropical world sufficiently humid to sustain regular agricultural activity associated with permanent settlement, includes lands with at least three months of rainy season. It is a zone of sufficient environmental, historical, and political consistency on the global scale to afford a broad unit within which some common processes may be observed and therefore in which research may be expected to have some general implications in addition to data and prescriptions of purely local validity.

With the support of the United Nations University, a group of geographers and research workers in related social sciences met at Kings College, London, in November 1983. They agreed to examine various aspects of spontaneous and planned pioneer settlement in a number of locations which it was felt would provide a small cross-section of frontier settlement experience in the humid tropics. These included locations in Central America, the Amazon Basin in Brazil and Colombia, the humid savannah and rain-forest zones of Côte d'Ivoire and Ghana, and the forested upland resettlement areas of Malaysia. It was agreed to examine and appraise existing and recent spontaneous and planned settlements in relation to national and regional policy, demographic changes, economic growth or decline, established needs, and environmental possibilities and constraints, and to attempt to achieve understanding of the processes involved and the dynamics of related social and economic changes. It was also agreed to look for broad principles and derive a set of guidelines for future colonization and settlement, to assess the contribution of such settlement to the economy, to appraise marginal land potential, and to suggest policies for land development agencies. The funding was modest, time and manpower availability were limited, and not all our targets were possible.

The workshop held in Kuala Lumpur, 17–21 September 1985, provided a series of intermediate reports on the work undertaken and reviews of pioneer settlement achievement and failure. The work of the different groups formed in 1983 was presented in combination with work by others in South-East Asia, notably a small group of Thai researchers and a group working in Thailand and Indonesia led by Dr. Harald Uhlig and supported by the Volkswagen Foundation. The combination of evidence from Latin America, West Africa, and South-East Asia provides a unique collection of material reviewing the state of the production frontier at a time of considerable change in the development of the agricultural economies of the

third world and the humid tropics, effectively a turning point in their agrarian history. We suggest "turning point" not only because more intensive systems of agricultural production have appeared, with effects even at the global level, but also because the evidence produced here suggests that the character of pioneer settlement, or rather of new agricultural settlement at the periphery, is changing and quite rapidly. Both these developments are the result in part of the emergence of a world system of interrelationships not just in traded agricultural products but in the exchange of ideas, techniques, equipment, and variable inputs such as fertilizers and pesticides and above all in the international politics of agricultural change, forest clearance, frontier advance, population movement, conservation, pollution, and environmental management.

The workshop is also to be seen as a contribution to the United Nations University's work in the area of resource policy and management in the humid tropics (including projects on agro-forestry systems, coastal resources, highland-lowland interactive systems, and climatic, biotic, and human interactions). All these are ultimately directed to the problem of identifying and fostering more appropriate and sustainable resource systems. In particular, they are examining the possibilities for sustained and higher yields, higher standards of living, improved equity in income distribution, and the management of multiple land uses. It will be seen that all these aspects appear in various forms and to varying degrees in the studies of the production frontier presented here.

Of course the identification of a production frontier, of a zone of colonization and pioneer settlement, is not always clear. Not all new settlement areas are spatially peripheral. There are "hollow frontiers," inner zones of relatively empty or weakly developed land, as in the Côte d'Ivoire example. The distinction often suggested between higher intensity systems towards the core area and lower intensity towards the periphery does not always appear. Whilst pioneer rubber production in the Amazon region was the product of an extensive gathering economy, rubber production in Malaysia appeared in a rain-forest frontier but associated with an intensive high-level technology. In Pakistan the use of tube wells and high-yielding varieties of wheat made it possible for some farmers to expand their production into relatively empty land which, until the new water and fertilizer technology was applied, had exhibited marginal characteristics. Our studies in Thailand show a great variety of production forms on the frontier of settlement, including very extensive but highly commercial farming systems responding to a growing urban market. The picture presented is of a highly complex pattern of developments, somewhat removed from the earlier conceptualization or modelling of the production as a zone of pioneer subsistence farmers with large-scale commercial systems, ranches, and plantations in the more accessible areas, all following in the wake of primitive hunting and gathering economies, occasionally also with a commercial character. Increasingly modern agriculture has to compete for its settlers with urban and industrial expansion, or even with new systems of agricultural production in established farming regions. Settlers need to be attracted by adequate title to land, housing, utilities and services, retraining and advice programmes,

financial support for initial periods of establishment, the provision of a commercial infrastructure, technical inputs, and an adequate social fabric. In some instances the production frontier has to be penetrated not by pioneers but by the members of an advanced socio-economic system who have a better than basic education together with modern skills, capital, and familiarity with market possibilities. Major commercial interests and land speculators have increasingly important roles on the frontier as tractorized vegetable and flower production appears, associated often with new modes of transport and new distribution networks.

Even the distinction between spontaneous and planned forms of settlement is not equally clear in every region. In certain of these studies it is apparent that intermediate forms of management exist between the extremes of wholly spontaneous and wholly planned settlement. We can contrast the "pioneer" advance of independent and spontaneous cocoa farmers in Ghana with the more constrained movement of independent crop farmers in Côte d'Ivoire, where the government seeks to effect a certain degree of planning control, or with the private but organized advance of vegetable entrepreneurs in Thailand, or the planned "toe-hold" settlements in Sumatra. In reality, pioneer settlements are mostly neither so spontaneous nor so planned. The planners are not just government or government agencies such as the army or the departments of forestry or agriculture but private corporations, including multinational companies, international and national finance agencies, estate owners, and land speculators. The settlers are not just small groups of young farmers looking for larger farms and fresh land, or groups of shifting cultivators like the hill tribes of Malaysia, but also farmers pushed out of their former holdings by the development of large-scale, mechanized, commercial agriculture; farmers looking for land on which to develop their own commercial, mechanized or plantation production; long-distance migratory farmers who specialize in opening up new lands and who are forever moving on; short-distance migrants expanding village lands; commuter farmers moving daily to a local periphery; farmers responding to inducements offered to settle on the frontier; war veterans; and even urban-based labourers and others returning to farming or miners and timber cutters engaged in spare-time cultivation. They may farm as individuals, they may be under contract to dealers, or they may be in co-operatives or grouped as estate tenants.

A great deal of frontier settlement is multi-purpose. Spontaneous settlers may have more than one objective, such as both subsistence and commercial cultivation, combined with gathering or timber cutting and the hope of rising land values and the eventual sale of property. Planned settlements may have political or military objectives and may be intended also to relieve population pressure on land or on urban jobs and resources. Failure to recognize the multi-purpose character of much planned settlement in the past has been a cause of the abandonment of some schemes due to the clash of the various interests involved, lack of clear identification of objectives, and frequently an inability to build not just settlements but communities—always difficult to establish when one considers that migration is socially, occupationally, and age selective.

The different kinds of settlers and management operate in a great variety of environments, including the highly acid soils with concretions and low nutrient status of the West African savannahs, the easily depleted, fragile soils of the Amazonian rain forest, the deeply eroded soils of the uplands of Thailand, and deep alluvium suitable for paddy rice and sugar-cane. The different kinds of forest and savannah woodlands cleared offer a great variety of weeds and woody regrowth. Uhlig (chap. 2) notes that despite evidence of soil fragility, deep ploughing may be essential to kill or suppress weeds, but in some environments the task of clearing trees and removing stumps in order to make ploughing possible is too demanding for the labour resources available or too costly even for mechanical methods.

The ecological limitations and consequences of pioneer settlement are a vast area of study of increasing importance as the more cultivable lands have been brought into production and as each fresh advance moves into more marginal conditions. Social change and environmental change are operating together as new kinds of communities emerge on the production frontier, each with different aspirations and, in many cases, with a greater disregard for long-term implications or prospects. The retreat of the rain forest and the destruction of the savannah woodlands mean not just the removal of a massive resource but the loss of whole ecological systems, many of which may never be restored. People have to eat, productivity levels in poor communities have to be raised, and the needs of an increasing urban population must be met. In many crowded areas the politics of preservation are impossible to effect, but conservation in the creation of new, stable, and productive ecological systems must be achieved or the current advance of the production frontier will produce only a transient increase in living standards and will be succeeded by even worse states of poverty.

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2

Spontaneous and Planned Settlement in South-East Asia

Harald Uhlig

This paper is an attempt to summarize important aspects of a recent book on re-settlement in South-East Asia (Uhlig 1984) and to add some new comments and material. Part of the book consists of studies of spontaneous land clearing in Thailand. Field-work and formulation of these studies were done by my younger colleagues of Giessen University and their Thai counterparts.

Clearing of the forests and the rapid expansion of new agricultural settlements are outstanding processes and problems of regional development in present-day South-East Asia. Pioneer settlement has been occurring recently on a tremendous scale—similar to the medieval clearing period in central Europe or to the expansion of North America's settlement frontier towards the west—most notably in the four ASEAN states of Thailand, Indonesia, Malaysia, and the Philippines. It contributes to the world-wide conflicts over land and resources, but also to the need to preserve a balanced environment. Well-founded economic interests in forest exploitation clash with those for the protection of the ecological potentials, vegetation, wildlife, soil conservation, water economy, etc. All are challenged by the need to clear new land for settlement and food production for a fast-growing, landless or "underlanded" population.

The aim of replacing the shifting cultivation of the hill tribes with permanent settlement and marketable crops is matched by the massive revival of uncontrolled swiddening by lowlanders and by an encroaching "commercial shifting cultivation." The impacts of cutting timber and/or clearing new fields are accelerated by the use of heavy machinery and power saws.

The land-hunger of smallholder pioneers, as well as of agricultural entrepreneurs growing crops for vital export earnings, clashes with the legal and fiscal interests of

government land and forestry authorities, whereas other official agencies are bound to follow the settlement extension by providing the needed infrastructure, such as schools, health stations, public transport, etc. Social justice may be upset by land conflicts at the pioneer front and by the dependence of smallholders on middlemen, contractors, or money-lenders. Labour migration from poor regions may be stimulated by the new opportunities but with uncertain socio-economic prospects.

Whereas the state-directed settlement schemes—such as Transmigrasi (“transmigration”), FELDA (Federal Land Development Authority), and others—are widely covered by official and scientific reports and plans, the spontaneous opening up of new agricultural regions is passing nearly unnoticed by research work or official publications. It has grown to such a scale and importance that it outstrips the official schemes in area, in population, and occasionally also in productivity (only in Malaysia does this seem to be reversed).

A programme initiated by the Volkswagen Research Foundation of Germany, funding research projects on present-day problems of South-East Asia, finally provided the opportunity to launch a study of some areas of recent spontaneous land clearing in Thailand with a team of younger geographers from Giessen University and a number of Thai colleagues and younger assistants. It is clearly much more difficult to obtain reliable information on the spontaneous clearing or even to assess its real extent than it is for the official projects, which are usually well documented and more or less exactly surveyed and delineated. We decided to focus our main interest on spontaneous clearing not only because of its scientific interest but also because of the strong practical importance of the undirected settlement for the entire regional and socio-economic development of the countries of South-East Asia.

Thus, we could hardly avoid reaching certain conclusions and making certain comparisons, which can be summed up under the heading “state-directed versus spontaneous settlement.” Hoping to focus attention on this question and to present some research findings on the hitherto neglected spontaneous land colonization, we would like to move from an originally purely scientific goal to the presentation of some arguments and theses which might be useful for further development policy in South-East Asia.

Like the majority of the developing countries of the world, those of South-East Asia—and the ASEAN countries in particular—are experiencing today a phase of rapid modernization. Still, rapid population growth and the consequent strong land-hunger remain among their major problems. Notwithstanding the impressive increases in food production during the last decades, it can only partly keep pace with the dramatic population growth, despite the initial successes in birth control. Likewise, all attempts towards industrialization and the fast growing urbanization have not yet provided sufficient employment other than agricultural work, and true alternatives of development are still widely lacking. With the agricultural population still constituting 60–80 per cent of the total population, the need for more land remains a dominating political problem, and the opening of new agricultural areas is a primary goal of regional and national development.

This means conflicts over land use and especially an ever-growing pressure on the forest reserves. Their rapidly progressing destruction by timber extraction as well as by slash-and-burn agriculture is growing into a severe ecological hazard. Within the socio-economic sectors, financial, political, and property-rights problems are added and aggravate the tasks of creating new agricultural holdings on a level well above a primitive subsistence economy together with sufficient economic prospects for the future. Moreover, these attempts are accompanied by speculative exploitation and corruption, giving priority to fast profits and no regard for ecological stability. South-East Asia's strong ethnic and cultural pluralities lead to additional political friction wherever foreign majorities, members of different religions, etc. become involved in the land conflicts. Similarly, the principles and goals of state-controlled planning and administration frequently run into conflict with the activities and needs of spontaneous land colonization and inroads into the forests. Opening up new areas for agriculture nearly always means the clearing of more forests. Thus, the conflicts either between the forest authorities and the spontaneous settlers (or squatters, as the authorities call them) or even between the forestry administration and the state-directed land-clearing schemes follow a predetermined course. A continual conflict of interests between the preservation of the ecological and economic values of the forests (timber, water-supply, soil conservation, climatic influences, wildlife protection, etc.) and agricultural expansion—or rather the need for more food and for more export crops for the sake of the national economies—is hard to avoid.

The provision of new agricultural land remains therefore a major problem of planning and development. Frequently the state-directed attempts, usually slow moving and handicapped by bureaucratic obstacles, have been beaten by spontaneous pioneer clearings, but at the same time often by political and social conflicts. Where these conflicts have developed into volatile political and armed conflicts, and sometimes into either insurgent activity or the formation of communist underground organizations, they have gained dangerous dimensions, as in the case, for example, of the Moro resistance in the southern Philippines. They have also brought about severe ecological damage.

THAILAND

When close examination of satellite photographs in Thailand revealed that 57 per cent of the forest cover of the national territory still existing in 1961 had shrunk to a mere 37 per cent in 1974, the Thai forestry administration issued an alert that created much concern. A recent paper by Boonchana Klankamsorn (1981) recorded a loss of 9.9 per cent of the forests per year between 1973 and 1978 and thus a remaining forest cover of only 25 per cent! This is, however, only one of the signals of the importance of balancing the opening of new settlement regions with a policy for the equally important protection—or even improvement and afforestation at appropriate places—of the national forest wealth.