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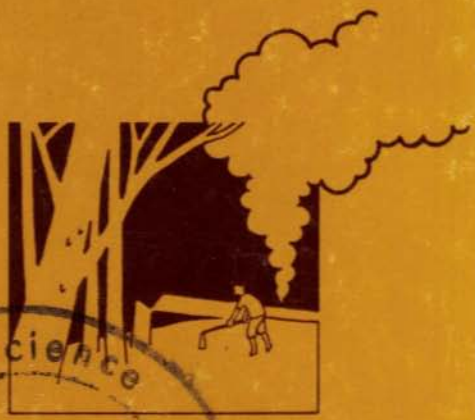

Swidden Cultivation in Asia

Volume One

Content Analysis of the Existing Literature: A Stocktaking Exercise

UNESCO

UNESCO REGIONAL OFFICE FOR EDUCATION IN ASIA AND THE PACIFIC
Bangkok, 1983

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PREFACE

This is the third and the final volume of a five-country comparative study on swidden cultivation in Asia, initiated in 1979 following the international symposium on the subject organized at the time of Tenth World Congress of the International Union of Anthropological and Ethnological Sciences (IUAES), which met in India in 1978. The Symposium was convened, after the Congress, at the Utkal University in Bhubaneshwar, Orissa. At the request of IUAES, Unesco provided, under its Man and the Biosphere (MAB) Programme, funds for the participation in the Symposium of four scholars from Indonesia, Malaysia, the Philippines, and Thailand.

MAB received the report on the Symposium and agreed to the proposal made by our Unit to conduct a comprehensive study on the swidden cultivation. Utilizing funds made available by United Nations Environment Programme (UNEP), the project was launched with the meeting of researchers convened in Bangkok in April 1979 to develop a comparative research design.

The Project was implemented in three phases. In the first phase, the researchers reviewed the existing literature on swidden relative to their country and identified major trends of research and thought, as also gaps in knowledge. The second phase focused on the compilation of country profiles on swidden based on secondary sources of data regarding geographical spread, demographic distribution and ethnic composition of swiddeners. These profiles provided typologies of swidden, gave history of the practice, and described governmental policy and measures to wean the people away from swidden. The outcome of the two exercises – of phase I and II – was reported in the first two volumes of the series brought out by this Unit.

The present volume – the third in the series – contains the outcome of the third phase, devoted to empirical in-depth studies of selected swiddening communities in the five countries: the Wancho and Digaru Mishmi in India, the Buginese and Keniah in Indonesia, the Iban in Malaysia, the Dumagat in the Philippines, and the Monya in Thailand. These communities were personally visited by the authors for field work, that involved non-participant observation, and both free associational and semi-structured interviews with

members of the swiddening communities, provincial leaders, and government officials. The approach followed by them is a mix of anthropological and sociological techniques. The accounts given by them are not strictly ethnographic; they have tried to see swiddening from an *emic* perspective but have also kept in view the wider context in which the swiddeners are located. They are treated as 'parts' of a wider whole; as 'isolables' rather than as 'isolates'.

Following the presentation of the five monographic studies, an overview summarizing the major findings of the country studies is provided by Ms Koto Kanno, Associate Expert of RUSHSAP who has closely followed the progress of the Project since June 1982.

The Research Design evolved by the researchers in the beginning of the Project is appended to the volume. It must be said that while the design guided work in all the three phases, exigencies of the situation have occasioned departures from it – a fact that must be acknowledged in any comparative research involving different countries, and researchers with differing orientations.

Completion of the Project, and publication of its findings in three volumes – as planned – is a matter of satisfaction. It is heartening that the first two volumes have received world-wide publicity, and are very much in demand. It is our hope that the third volume will also receive the attention it deserves.

We wish to acknowledge the support and encouragement that we received from the MAB secretariat, particularly Dr F. di Castri and Dr Malcolm Hadley; they fully entrusted the task to this Unit and always showed readiness to promote social science contribution to MAB.

17 December 1984
Unesco, Bangkok

YOGESH ATAL
Regional Adviser for Social and Human Sciences in Asia and the Pacific

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INTRODUCTION

Yogesh Atal
and P.L. Bennagen

The essays contained in this volume constitute the first part of the Report on a five country comparative study on Swidden Cultivation carried out in Asia under the auspices of Unesco's MAN and the BIOSPHERE (MAB) Programme, and with major funding support from the United Nations Environment Programme (UNEP). This volume surveys the existing literature on Swidden Cultivation in the five countries – India, Indonesia, Malaysia, the Philippines, Thailand – with a view to identifying trends of research over a period of time and to highlighting the contribution to knowledge made by the studies. The second volume presenting country profiles of swidden is under preparation; and the third volume will be devoted to five in-depth studies of communities still practising swidden cultivation – empirical research for this is currently in progress.

This research project is concrete evidence of the social science contribution to MAB. It is also a first effort of its kind where researchers from five countries have collaborated for a cross-cultural comparative study on man-environment interaction. Having themselves formulated the research design, they willingly subjected themselves to its discipline, and even closely followed the time-table in implementing its various phases.

I

Swidden cultivation was one of the several research themes suggested by the national seminars, organized in 1977 by the Unesco

Office of the Regional Adviser for Social Sciences in Asia and the Pacific, to promote interest amongst the social scientists in the study of the environment. These seminars underlined the need to guard against one-sided accentuation either on the environment or on the culture. The letter A in the acronym MAB signifies the linkage between Man (and his culture) on the one hand, and Biosphere, on the other. This obviously requires an interdisciplinary perspective fusing the twin concerns of culture and the environment.

Swidden has generally been seen as cultivation and not culture by those who are overly concerned with the "degradation of the environment". To bring the concept of culture in their frame of reference is as essential as bringing the concept of environment in the domain of culture. Hence the priority assigned to this theme by the national seminars.

As things developed, the 10th International Congress of Anthropological and Ethnological Sciences convened a Post-Congress Symposium on this theme at Bhubaneshwar, India, from 19 through 24 December 1978. The organizers of the Congress approached Unesco for collaboration. The theme being of interest to the MAB programme, Unesco agreed to fund the travel of four scholars from the Philippines, Thailand, Malaysia, and Indonesia to enable their participation in the Symposium.

The Symposium addressed to the problem of Shifting Cultivation both from the perspective of Quality of Life and of Environment. The Symposium came to the conclusion that practitioners of Shifting (Swidden) Cultivation have always been viewed from the perspective of the outsider who treated them either as a different and a closed social system (in the classical tradition of anthropology, a microcosm), or viewed them as a satellite system having deleterious effects on their society and surroundings. The first perspective led to the unintended consequence of a 'leave them alone' philosophy and the second to the missionary zeal reflected in a 'change-them-fully' slogan. That both extreme positions are untenable has opened a new avenue for research, to see how to treat the problem (if it is a problem) of Shifting Cultivation.

There has been very little effort to see the entire problem through an "emic" perspective, i.e., the perspective of the tribal himself who lives that culture. Solutions sought by the modernizers to the "problems" – that are non-existent for the tribal – are, there-

fore, irrelevant or non-acceptable to the tribal. He has also not been provided with the alternative ways of earning a subsistence.

The papers presented at the Symposium led to a very interesting and absorbing discussion. Rather than concentrating on the descriptive ethnography and material cultures of the various societies practising shifting cultivation, the group engaged in the discussion of some fundamental problems – both theoretical and methodological. Some of the major points raised and discussed are listed below:

1. Is Swidden Cultivation a practice peculiar only to the primitive tribes? The Sri Lankan and Korean cases contradicted the stereotype: in Sri Lanka, it is practised by Sinhala-speaking people; in Korea – in the northernmost mountainous part – it is practised by those people who escape to the mountains for political, economic, and religious reasons.

2. Is Swidden Cultivation to be viewed only as an economic activity or does it need to be studied in specific historical and sociopolitical contexts? It was regarded as a product of hierarchical societies which pushed and exploited small, acephalic, tribal communities. In this sense, Swidden Cultivation is linked with the distribution of power. A situation has been created through which the tribal has been made a refugee in his own habitat.

3. Is Swidden Cultivation really uneconomical? Does it destroy the environment, or is it the simple fire phobia of the Westerner that regards Swidden Cultivation as bad? Strangely enough some of the environment specialists in the group took the stand that in the kind of environment in which this kind of cultivation is practised, it is the most rational form of cultivation, as no other form of cultivation will be possible, or economical. They also argued that the so-called "innocent" people know enough about their environment and they take good care of those trees and plants that are regarded by them as useful. Only the unwanted ones are destroyed. On the other hand, the forest department people have been rash in introducing certain kinds of flora which are more injurious to the soil. For example, the large-scale planting of eucalyptus trees has resulted in the further lowering of the subsoil water-level.

4. Can there be a positive policy towards Swidden Cultivation? Rather than condemning it as bad (without proper assessment of the extent of damage caused by it) will it not be advisable to im-

prove the methodology of Swidden Cultivation so that yield is increased and damage to the environment caused by it is minimised? It was argued that any situation of man-environment interaction is basically exploitative and therefore some damage to the environment is inevitable, no matter what form of agriculture people practice. Why, therefore, single out only this form of environmental exploitation for wholesale condemnation?

The questions generated at the Symposium called for a fresh perspective, and for a newer set of studies couched in a cross-cultural frame of reference. To promote such a programme of research, Unesco-MAB convened a meeting of researchers to examine the possibility of developing a research project on Swidden Cultivation which would contribute to the MAB programme of the countries of the participating researchers, and would promote better understanding of the problem in question.

The meeting was convened within the framework of MAB Project I ("Ecological effects of increasing human activities on tropical and subtropical forest ecosystems") and the UNEP-Unesco programme for the development of ecological pilot projects in tropical forest areas (UNEP Project 1102-76-01).

The meeting held from 19 through 23 April, 1979 in Bangkok at the Unesco Regional Office, invited the participants to:

1. Define the scope of the study and identify researchable sub-themes in the light of the specificities of different national situations;
2. Establish a common methodology of research, to ensure comparability;
3. Evolve a commonly agreed format for the presentation of country reports, and for a consolidated comparative profile;
4. Review practical arrangements for the carrying out of the study (co-ordination, budget, time schedule, etc.); and
5. Discuss other related matters.

Scholars from five countries of Asia were invited to join the programme of research on Swidden Cultivation. They were from India (Professor L.K. Mahapatra: Anthropoligist from Utkal University, Bhubaneshwar), Indonesia (Dr. B. Soewardi from Bogor Agricultural University), Malaysia (Dr. V. Selvaratnam: Sociologist from the

University of Malaya, Kuala Lumpur), the Philippines (Professor P. Bennagen: Anthropologist from the University of the Philippines, Manila), and Thailand (Dr. Narong Srisawas: Rural Sociologist from Kasetsart University).

With the exception of the researcher from Malaysia – Dr. V. Selvaratnum, who expressed later his inability to work on the project – all the participants to the meeting worked on the project and completed the first phase. For Malaysia, the study for this phase of the project was entrusted to Dr. Hood Muhammad Saleh of the University Kebongasaan, Malaysia.

II

Despite a long tradition of research on swidden cultivation in anthropology, the existing literature has not edequately responded to the new questions being raised today. Initially, swidden cultivation was studied (under the popular title of shifting cultivation) as a form of primitive economy practised by tribal people in far flung places, living an exotic culture. While the philanthropists who found the lives of swiddeners to be hard and their standard of living lower, were motivated by the desire to modernize them, the anthropologists have largely been associated with a "save the culture" movement. The recent concern with the degradation of environment has, in a way, strengthened the cause of the administrators and philanthropists by getting an additional reason for shifting the "shifting cultivators" from their traditional economy to some other modern form. It is argued that not only the "Quality of Life" (QOL) of the swidden cultivators is poor, they are also degrading the Quality of Environment (QOE). Several measures have been contemplated by the governmental and non-governmental agencies to tackle the twin problem of improving the quality of life, and saving the environment. In the process, difficulties have been encountered: swidden cultivators resist the externally induced programmes of change; and some scholars, including anthropologists, have argued that the decision to change the way of life of the people practising swidden cultivation is a hasty one and is ill-informed. The Governments are gradually coming round to the view that in many areas swidden cultivation may not be totally stopped, may even have to be improved upon, as all this population cannot be rehabilitated in plains lands, where population pressure is already very high.

Such a situation calls for a fresh investigation of the problem in a social scientific interdisciplinary perspective. The present project attempts to respond to this new challenge. It has endeavoured to do the following:

1. A consolidation of the existing knowledge about the people practising swidden cultivation.
2. A systematic empirical investigation of the process of development in the area where swidden cultivation is the predominant mode of subsistence.

Monograph and research articles are available on swidden cultivation. But these are discrete studies, and are largely discipline bound: anthropological studies have focused on the customs and practices and have followed the tradition of ethnography (of describing the way of life in the idiom of the eternal present); environmentalist studies have generally ignored the people and concentrated only on the nature–made part of the environment. The present study aims at fusing the two perspectives and investigating the problem in a holistic frame.

As an initial step towards evolving a more accurate and a common language for comparative purposes, the term *swidden*, instead of the more popular terms *shifting cultivation* and *slash-and-burn cultivation* is used in this research. The terms *shifting cultivation* and *slash-and-burn cultivation*, while describing cultivation techniques, have acquired "disparaging connotation(s) which misrepresent the system"[1]. The term swidden specifies a farming technology as well as a lifestyle based on a particular adaptation to forest and hilly environments.

The adoption of *swidden* as the common or generic term does not preclude, however, the use of the local terms not so much for their ethnographic flavour as for clarity.

Each country study is divided into three distinct components, each constituting a phase, and resulting in a separate monograph. The three parts of the study will be the following:

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[1] Barney, George L. 1970 *An Analysis of Swidden Cultures in Southeast Asia* Ph. D. dissertation (mimeo.) University of Minnesota, p. 2

Part I Content Analysis of the Existing Literature on Swidden Cultivation: A Stock-Taking Exercise

Part II Country Profile of Swidden Cultivation

Part III Holistic Study of an Area under Swidden Cultivation

This is the first monograph in the series of three to be brought out under this project on Swidden Cultivation, and it includes the results of the exercise carried out in Phase One of the Project.

The purpose of this exercise was to review the trends of research in this field over a period of time and to identify the gaps that exist, either in terms of the areas and people covered, or in terms of the problems investigated. The review also attempts to identify methodological innovations.

The content analysis of the existing literature on Swidden Cultivation is essentially a stock-taking exercise. The survey of literature has been carried out to answer the following question:

1. Which particular ethnic groups and geographical areas have been researched and by whom?
2. How old (or new) are the data relative to different ethnic groups?
3. Are there any shifts in the interest in terms of topics, or tribes?
4. What has been the volume of publications in different time periods, and how many scholars have been involved?
5. Who carried out the studies (in different periods),
    i. which disciplines?
    ii. which nationalities? (locals - foreigners)
    iii. which professions? (scholars - administrators)
6. What methodologies have been employed in the study of the swidden cultivation, and what problems have been encountered?
7. What hypotheses/generalizations have been thrown by previous studies and are they corroborated by other studies?
8. What gaps exist, and what priorities can be established?

III

A quick review of the country reports suggests that swidden cultivation as a research interest, involving both man-environment and man-man relationships, has attracted researchers from both the natural sciences and the social sciences. Research was initially ethnographic until swiddening became part of conservation and development concerns of government, starting somewhere in the 1960s. This led to policy-and action-oriented research. In the case of Thailand, additional reasons for research on swiddening include national security problems in the border areas, and control of opium poppy cultivation.

In any case, anthropologists and forestry specialists, individually and sometimes jointly, have maintained an abiding interest in it. However, in Indonesia, anthropological studies in this field began waning so much so that no study on swiddening by anthropologists was reported in recent years. On the other hand, studies by multidisciplinary and multiprofessional study teams have become more common. This was attributed to the urgent need for research-based data for policy-making and development planning.

Indeed, as the various Asian countries formulated their development plans, starting in the 1960s for some, and in the 1970s for others, they gradually adopted a holistic approach to include not simply economic variables but also socio-cultural and ecological ones. The environment movement in the 1960s as well as the energy crisis in the 1970s generated international concern for environmental research. This was reflected in funding support both from foreign foundations (like Ford) and the local ones for research on swiddening.

But even as research activities became policy-oriented, scholars from both the natural and the social sciences continued to address themselves to swiddening societies as scholars concerns. Scholars have come not only from anthropology and the forest and agricultural sciences but also from geography, geology, medical science, linguistics, religious studies, social work, sociology, social psychology, and economics. The increased participation of a wide range of disciplines and professions was accompanied by the use of a greater number of research methods and techniques. The technique of participant observation started to be supplemented by social

surveys which allowed the use of quantitative techniques. In the Philippines, Conklin developed the ethnoecological method even as Frake showed how ecological and ethnographic studies may be done within the framework of cultural ecology. From the natural sciences, experimental studies and laboratory analysis of environmental data began to supplement the usual descriptions based on ocular inspection. Systems modelling associated with natural resource management began to be applied particularly by those in development planning.

The increased participation of a greater variety of disciplines and professions indicates the improved quality of the educational system in the various countries. It further shows the increasing involvement of local scholars in research, both for their professional growth and for policy-making. While foreign scholars, usually coming from the colonizing countries, invariably contributed the first set of studies, the native scholars now dominate the research scene.

Most scholars of diverse disciplinary and professional background, nationalities, and motivations have contributed to a greater variety of studies on swidden. This is evident in the increasing number of ethnic groups covered as well as the greater diversity of topics or themes pursued. Practically all studies on swiddenists as whole cultures were done on the hill groups. In India, however, swiddening groups in plain forests were also investigated. But lowlanders who went into swiddening for reasons of poverty or some other pressing reason were also studied. Most studies on swiddening by anthropologists were done as part of the more comprehensive ethnographic studies as well as those on socio-cultural change. Often swiddening was discussed only as part of other economic activities. Other studies focused on selected aspects of culture (e.g., religion, art, kinship, language, political organization) with swiddening as a secondary, if not peripheral, interest. More recent studies in the Philippines motivated by practical considerations tried to look into the attitudes and perceptions of swiddenists regarding environment, conservation, resettlement programmes and related problems.

Contributions from the natural sciences emphasized productivity issues and environmental factors exploring further, and in greater detail, the relationship between environmental factors and the developmental potential of swiddening. Of special theoretical and practical significance are the studies on agricultural intensification

and extensification. Studies of this sort should shed light on the developmental alternatives for swiddening.

There is fairly wide coverage both in terms of geographic area, ethnic groups, and topics. But in India, only a few were based on states and regions. Moreover, data on the number of swiddenists are only up to the 1960s as no study in the 1970s could be used as a basis for estimates. Similarly, the Thailand country report focuses on the hilly Northern Region where most of the tribal groups live and therefore where most of the studies were conducted. Estimates, however, are more recent than those in India. In Malaysia, there has been an outburst of research activities in East Malaysia covering the various tribes in Sabah and Sarawak, following the twin concerns of the government to improve productivity while reducing the negative effects of swiddening on the environment.

The available literature on swidden cultivation continues to confirm the complexity and variability of swiddening already observed by earlier scholars[1]. The varied ethnographic contexts in which swiddening is described provide us with a better appreciation of how swiddening is intimately linked with environmental and socio-cultural factors both at the micro- and macro- levels. But the particularizing tendency of ethnography is at once a boon and a bane. While it provides us with a richness needed for understanding its internal dynamics and the human dimensions, it makes generalizations and theoretical formulations rather difficult. One source of difficulty, as noted by the Malaysian country report, is the neglect of comparative studies. Consequently, the reports contain a variety of low-level generalizations as in the probability statements on population pressure and on productivity.

The population hypothesis recurs in the literature – both old and new. The older studies merely assert but the new ones try to prove it. But then also the "hypothesis" appears in many forms. The older literature tended to merely assert that population pressure on land leads to disappearance of swiddening. The newer data show

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[1] See, for example, Conklin, Harold, 1957. *Hanunoo Agriculture*, FAO, Rome, and Spencer, J E. 1966. *Shifting cultivation in Southeast Asia*, the University of California, Berkerly

this to be the case in some instances but not in others where some intensification with increased productivity could occur. In still others, it persists even in densely-populated areas. Clearly, the debate is not closed; there is a need to identify other relevant variables, within the framework of multiple causality, affecting the relationship between population pressure, environment, technology, productivity, and direction of the development of swiddening.

Evaluated by theoretical traditions, the literature is characterized by the use of either functionalist or evolutionary theory. In the first case, swiddening is seen as an adaptive system contributory to the maintenance of a society. In the second case, it is seen as a stage after hunting-gathering and before permanent agriculture. Refinements of these are now being made in the recent literature thereby specifying, beyond the gross statements, precisely the dynamics of maintenance and transformation. An encouraging example is the use of exchange theory which attempts to go beyond the usual teleologic and homeostatic formulations of the older functionalism. Similarly, the more sensitive use of cultural ecology along with structural analysis attempts to go beyond the simplistic determinism of evolutionary theory.

As complex a phenomenon as swiddening, notwithstanding the encouraging trends, necessarily leaves some gaps. For example, not all ethnic groups in the various countries have been studied. Even those already studied for some reasons other than a better understanding of swidden cultivation need to be re-studied. In this connection, there is a need to keep a holistic view of the problem by involving multi-disciplinary and multi-professional study teams.

There are very few quantitative studies at the micro- and macro-levels both in terms of environmental factors as well as socio-cultural factors and the interrelationships of these two broad categories. Such studies should also be made on a long-term basis and not simply limited to one annual cycle.

There is also very little attempt to systematically situate swiddening in the larger political and economic structures that increasingly lead to the loss of autonomy of integral swidden systems. As the Indonesian case points out, and as is also clear in the other papers, swiddenists are exposed more and more to dominant societies. This calls for urgent holistic and interdisciplinary studies in support of broad-based development as well as empirically-grounded theory.

It is hoped that the review of literature on swidden relative to five countries of Asia will be of use (i) to scholars who may be tempted to take up studies to fill research gaps, and (ii) to administrators and planners who would wish to consult the existing literature to base their policies and programmes for the swiddenists and the swidden.

INDIA

INDIA

L.K. Mahapatra

An Overview of Swidden Cultivation in India

There are two major areas in India where swidden cultivation is practised: (i) Central India, comprising two states, Madhya Pradesh and Orissa; (ii) Northeast India, comprising States of Assam, Nagaland, Meghalaya, Manipur and Union Territories of Mizoram and Arunachal Pradesh. Whereas in Orissa there are ten important tribes practising swidden cultivation, in Madhya Pradesh only three or four tribes, mostly in the Southeastern part adjoining Orissa, are engaged in this. Of the total land-surface of Orissa 17.52 per cent, involving about one million people, is under the direct impact of swidden cultivation. As for other parts of India, no dependable estimates exist of the actual area under direct impact of the swidden cultivation.

As a result of the rising rate of population growth, heavy pressure on land, capitalistic exploitation of forest resources and extensive mining operations, the British colonial Government of India adopted a restrictive forest policy and put curbs on what was called "shifting cultivation". The present swidden cultivation ecosystem, with a much reduced fallow period and consequent reduction in soil fertility and increase in weeds, is mainly due to the governmental policy. This is especially so in Central India where at least 30 years of fallow period was considered necessary for the climax vegetation of *Shorea robusta* to stage a come-back. In South Orissa, the fallowing

period has come down to even 4-5 years. No wonder, hills after hills have been laid bare due to heavy soil erosion. On the other hand, in Northeastern India there is higher precipitation, quicker tree growth, and lesser population pressure on land. The hills there have, therefore, adequate tree cover and the fallowing cycle is much longer. Again, it remains to be studied, whether soil erosion and depletion of soil are more serious in North-East Orissa, where the swidden cultivators use ploughs to horn up the soil. In other parts of India, these cultivators use hoes, picks and digging sticks to turn the soil, or to mix the ashes as manure as deeply as possible. Thus, we may point to two different patterns of swidden cultivation in India: Central and the Northeastern. This is perhaps reflected in the difference in government concern with swidden cultivation. Whereas in Orissa and Madhya Pradesh, the states are taking initiative in inducing people to leave swidden cultivation and take to permanent cultivation, on land provided by the Government, no such sustained and insistent effort is being made in Northeastern India. Of course, there are some individual farmers in the eastern region who have voluntarily adopted terrace cultivation and horticulture.

The government policy, even within the same state as in Orissa, is sometimes self-contradictory, especially between two government departments. Whereas the Forest Department tries to enforce a ban on swidden cultivation, in order to conserve the forests, the Tribal and Rural Welfare Department – looking after the welfare of the scheduled tribes and castes – would like to improve upon the swidden cultivation practices. A careful analysis of the governmental policy and programmes is needed to identify inconsistencies and built-in contradictions.

There is a great need to assess the extent, nature and direction of dependence on swidden cultivation as a principal mode of subsistence in different parts of the country. The dependence on swidden cultivation may be considered community-based or individual-based. Thus, exclusive community dependence may be construed as almost total dependence on swidden cultivation by almost all (or at least 75 per cent) of the households. A typology of swidden cultivators based on their degree of dependence on it is proposed below:

Exclusive dependence

a) *community-wise:* when no other type of cultivation is practised, no other type of land is *available* for *permanent* cultivation, or no other occupations are there to be taken recourse to;

b) *individual-wise:* the landless, immigrant, recently displaced or disinherited individuals and their households may depend on it exclusively.

Major dependence

a) *community-wise:* obtains, when 50-74 per cent of the households depend almost wholly on swidden cultivation, while others may take up agriculture, other occupations, like growing of cash crops such as oranges, bananas, turmeric, and ginger;

b) *individual-wise:* When agriculture, mining, wage, tea plantation labour or other such cash income supplements earnings through swidden.

Contingent dependence

a) *community-wise:* when almost all households of resettled, displaced, or disinherited or transplanted village communities, usually as a consequence of government decision or action, may carry on swidden cultivation in their new settlement for 2/3 years as a contingent phase of adoption of agricultural innovation or till a new avocation is stabilized;

b) *individual-wise:* when left with no other option, individuals take up swidden cultivation.

Marginal dependence

a) *community-wise:* found among communities transplanted in self sponsored resettlement with greater dependence on agriculture or wage-labour or mining labour, or among acculturated tribal sections, where the income from swidden cultivation falls below 25 per cent of the total household income from all sources;

b) *individual-wise:* when individual households, even non-tribal ones, take to swidden cultivation for supplementing their incomes till they leave it under pressure or force from the government officials.

Some characteristics of swidden, as practised in India, may now be noted:

1. With the simple technology and division of labour based on age and sex differences, and without any large-scale group speciali-

zation of work, swidden cultivation has been found to be highly adapted to the topography, soil type, manpower resources of the region.

2. Land for swidden cultivation was village or lineage-owned and one could cultivate as large an area as was manageable and necessitated by the manpower available in the household.

3. Capital investment was minimum and within the means of each household to be renewed, when necessary.

4. Deployment of labour beyond the household strength was available through organized labour exchange groups.

5. A large variety of crops is grown—at least six varieties of cereals (millets), five varieties of pulses, four varieties of edible leaves besides one variety of oil seed.

6. Since the crops ripen at various times during the stretch of about an eight-month cropping season, there is at no time the risk of total crop-failure, whether due to drought or to excessive rainfall in a region of uncertain monsoons.

7. As the food crops are available for harvest at different times, the subsistence cultivators do not have to wait for a long period before the next harvest of cereals.

8. These crops together provide them with a more balanced diet than from the lowland or other fields of permanent cultivation which yield usually only paddy. The needed cash is secured by growing some cash crops like turmeric or ginger or oilseed or by exchanging some crops like pulses for cash.

9. Swidden cultivation is the only means of survival for those sections of the population, who do not possess any lowland or terraced plots of land because of the pressure of population or because of their being later immigrants having no suitable lands for permanent cultivation. Thus, swidden cultivation has been a safety valve against pauperization and destitution. This function of swidden cultivation is even more poignantly true in mining and industrialization areas, where the swidden cultivators are overnight dispossessed and disinherited of the lands over which their forefathers had control for at least several centuries in the past.

For proper understanding and prognosis of the situation, not only the pattern of dependence of the swidden cultivators themselves, but of their immediate neighbours and other sectors of a re-

gion's population must be considered from the point of view of the national economy. It has been borne out by the previous studies that swidden cultivation production per acre compares very well with, even be better than, the production from alternative modes of agriculture, like terracing, permanent lowland or upland cultivation. The provision of alternative or supplementary sources of income and employment in the hills should also engage our attention. Some experimentation with alternative modes in crop rotation, cultigens grown, fallowing period, and trees to be grown during this period, pest and weed control, as well as hybridization of species of cultigens to make them more drought-resistant and pest-resistant is also called for.

Ethnic Groups and Swidden Cultivation

Same practice different names

In various regions of India, swidden cultivation is known by different terms. In Assam, Meghalaya, Nagaland, Mizoram, Manipur and in Arunachal Pradesh, swidden cultivation is widely known as *Jhum* and the swiddener as *Jhumia.* In some parts of Nagaland, swidden cultivation is known as *Tekonglu.* The Adi of Arunachal Pradesh call it *Adi-abik,* whereas among the Rang of Tripura, it is known as *Hooknismong.* In Orissa, the Kondh, the Koya and other Dravidian-speaking tribes refer to it as *Podu, Gudia* or *Dongarchas,* the Saora call it *Bagada*; it is known as *Angwal* among the Lanjia Saora. Some Kondh of Orissa call it *Rama* and the Kutia Kondh of Phulbani name it *Berenga.* In Northern Orissa, among the hill Bhuiyan it is known as *Komanchas,* the first year swidden being called *Biribhuin,* the second year swidden, *Jala* and the third year swidden, *Nala.* In Madhya Pradesh, among the Baiga, swidden cultivation is known as *Bewar* whereas among the Abujhmaria Gonds of Bastar, it is known as *Penda* and among the Korku of Melghat forest, it is known as *Dahya.* In Tamilnadu and South Kanara of Karnataka, it is called *Kumari.* The same term is used in Maharashtra. Among the Solaga of Karnataka, it is known as *Podu*, so also in Andhra Pradesh. In Rajasthan, it is known as *Dandakast* in plain forest and *Daikast* in hilly regions.

In Western Sambalpur, as also widely among Madhya Pradesh tribes, *dahi* or *dahia* is practised whereby branches from forest trees are cut and spread over a level land, then burnt, thus reducing them to ash manure. Even on *bewar* fields in the second or third year *dahia* is practised. The Hill Bhuiyan of Orissa also practise such ash-manuring in the lowland fields and this is also known as *dahi.* In parts of Malabar, the local people grow paddy in private forest areas in Ernad Taluk by clearing the forest on gentle slopes and in flat areas with no definite rotation or fallowing cycle. The local name for this type of cultivation is *Ponam.*

The ethnic groups practising swidden cultivation in different parts of the country are given below:

Table. Ethnic groups practising swidden cultivation

States	Groups
Andhra Pradesh	Kolam, Hill Reddi, Khond, Samantha, Savara
Assam	Garo, Naga, Khasi, Mizo, Mikir, Meri Dagla
Bihar	Kharia, Male, Souriya, Pahariya
Gujarat	Kunbi, Kokna, Varli, Mavchi, Bhil
Karnataka	Malekudia, Kumbi, Betta Kuruba, Jenukuruba, Soliga
Kerala	Irula, Muduga, Kurumba, Kurichiyar, Paniyar, Malanaikan
Madhya Pradesh	Baiga, Madia/Maria, Gond, Mawasi, Pande, Korwa, Korku/Kodaku, Majhwar, Agaria, Pahari Korwa, Manjhi, Bharia
Maharashtra	Thakur, Katkari, Kunbi, Konkani, Warli, Mavchi, Bhil, Wakkal, Halkki, Kumari Maratha
Manipur	Kuki, Tangkhul, Hmar; Mao, Maring, Kahui, Kacha Naga
Meghalaya	Khasi, Garo, Jaintia, War, Pnar

Nagaland	Sema, Ao, Lohta, Konyak, Rengma, Tangkhul, Naga
Orissa	Bhuiyan, Juang, Erenga Kol, Kondh, Kutia Kondh, Binjhia, Kamar, Saora, Jatapu, Paraja, Gadaba, Koya
Uttar Pradesh	Sahariya (scheduled caste)
Rajasthan	Bhil, Saharia, Mina, Bagri, Garasia (Jogi and Dholi castes are also said to practise)
Tamil Nadu	Kadar, Malasar, Pulayar, Sholagar, Irula, Mudigar, Malanaidan, Naicke, Male Kudiyar
Tripura	Tripuri, Jamatia, Kuki, Garo, Reang, Naotia, Lushai, Halam, Mag, Chakma
Union Territories	
Arunachal Pradesh	Aka, Miji, Bangro, Bangni/Dafla, Adi, Miniyong, Padam, Miri, Mishmi, Tangsa, Singpho, Wancho, Nokte
Mizoram	Mizo, Kuki, Hmar, Lakher

As is clear from the table, in all the regions only the scheduled tribes are practising swidden cultivation excepting the Saharia scheduled caste in Uttar Pradesh and local peasant castes in Malabar (Ernad Taluk) in Kerala. Though the complete list of scheduled tribes practising swidden cultivation is not possible to adduce here, the swiddener scheduled tribes would be definitely much more than 109, estimated by D.C. Kaith (1958), but much less than the total number of scheduled tribes all over the country. Again, all the scheduled tribes of Arunachal Pradesh, expect the Apatani, Monpa and Sherdukpen, pastoralists practise swidden cultivation. Similarly, all the scheduled tribes of Nagaland except the Angami and Chakesang terrace cultivators and a few other groups depend on swidden cultivation. In Mizoram, all the scheduled tribes are swiddeners, whereas in Meghalaya the scheduled tribes combine swidden cultivation with horticulture. Some tribes like the Saora of Orissa combine terrace cultivation with swidden cultivation.

For this study, we have relied largely on the work of anthropologists, a few economists, and fewer geographers who have endeavoured to study swidden cultivation, swidden economy, and swidden cultivators. Professional social scientists have taken these studies only since the 1930s.

Status of Study of Swidden Cultivation

The earliest writings on swidden cultivation in India go back to the colonial, military and administrative officers of 19th century. They did not devote a whole book or even a whole chapter to swidden cultivation. Whether on a military march through the unsubjugated country side, or as untrained forest officials in search of sport and thrills, or as administrators of the British Raj working in the interior, foreigners were the first to sketch the major modes of livelihood of the tribal people. Invariably in the northeastern region of India and in the Central Indian plateaus and hill ranges as well as in the Daccan, these British officials found swidden cultivation being practised by the tribes and reported about it. To this genre of untrained, casual, and unprofessional observers and chroniclers we owe a valuable corpus of pioneer literature on the tribes of India. For example, Macpherson and Campbell were military officers who were sent on a mission to compel the Kondh of Ganjam and Boudh-Kandhamal districts of Orissa to stop human sacrifice (*Meriah* sacrifice) for growing better crops; these wrote about the practices of the Kondh. J. Forsyth, a military officer, wrote *The Highlands of Central India* and observed and recorded the *Bewar* and *Dahia* swidden written pioneering monographs on tribes of central India and eastern India in his famous book, *The Descriptive Ethnology of Bengal.* He had also written about the swidden cultivation in all these parts.

Similarly, several officers of the Indian Civil Service, compiled exhaustive ethnographic notes on the *Tribes and Castes in Bengal* (Risley, 1891), *Tribes and Castes of Central Provinces of India* (Russell and Hiralal, 1866, 40 vols.), *Tribes and Castes of Bombay* (Enthoven, 1920-22, 3 vols.), *Tribes and Castes of Northwestern Provinces and Oudh* (Crooke, 1896, 4 vols) and *The Travancore Tribes and Castes* (Krishna Iyer, 2938-41, 3 vols.). Besides these,

there were also painstaking compilers of Imperial Gazetteers of India including district Gazetteers which dealt with the swidden cultivation of tribes as a part of the general description of the region. Overlapping with this period, we find some administrator-anthropologists belonging to the Indian Civil Service, who wrote classical pioneering monographs on tribes of India in the first and second decades of the 20th century. While writing on swidden cultivation, a good deal of attention was given to their mode of cultivation and other aspects of technology and related rituals. Some important monographs on this series were the Khasi(Gurdon, 1914), the Garos (Playfair, 1909), the Angami Nags (Hutas (Hutton, 1921), the Lhota Nagas (Mills, 1922), the Rengma Nagas (Mills, 1937), and the Lakhers (Perry, 1932)

S.C. Roy – a lawyer by profession, who got interested in tribal ethnography through his professional involvement into the problems of his tribal clients became a pioneer Indian anthropologist. His only full-length book on a swidden cultivator tribe was on the Hill Bhuiyans of Orissa (1935). As Roy became an honorary lecturer in ethnology at Calcutta and other universities, he may be considered the first-ever Indian professional anthropologist to study a tribe practising swidden cultivation. Again in the 1930s Verrier Elwin wrote on a swidden cultivator tribe, Baiga (Elwin, 1939), and on the problems of their swidden cultivation. He also wrote a short monograph on the Juang of North Orissa (Elwin, 1946) and on the Bondo Highlanders of South Orissa (Elwin, 1950). In the 1940s, another eminent anthropologist – Haimendorf – devoted a book to the Reddis of Bison Hills (Haimendorf, 1945).

In the early fifties, tribal research institutes were established in those states which had substantial tribal population. The Tribal Research Institutes of Orissa, Madhya Pradesh, Andhra Pradesh, Rajasthan, Gujarat, Assam, and later on in the Northeast Frontier Agency (at present Arunachal Pradesh) and Maharastra took some interest in studying the problems of swidden cultivation and swidden cultivators. The Research Directorate of Arunachal Pradesh is specially credited with publication of an array of short monographs on swidden cultivator tribes like the Dafla, the Aka, the Gallong and the Padam-Min-yong. Similarly, the Anthropological Survey of India has also published a number of handbooks on tribes of India, for example, the Kuvi Kondh and the Didayi of South Orissa, who are the swidden cultivators of the region. Thus 1950-51 would be the

watershed between the disciplines as also the nationality of the researchers who made the problems of swidden cultivation their concern.

The only published descriptive book till today in the field of swidden cultivation is the one on Tribal Economy by an economist from Madhya Pradesh, who wrote on the swidden cultivation of the Baiga (Nag, 1957). Another major work on swidden cultivation was by Mahapatra (1960), whose doctoral dissertation was devoted to the Hill Bhuiyan swidden cultivation and economy and their transformation, but this is still unpublished.

Another book devoted to the examination of carrying capacity of land under swidden cultivation was by Bose (1967) – a geographer currently employed as a human ecologist in the Anthropological Survey of India.

A major study on the Socio-Economic Impact of Shifting Cultivation Control Schemes in North-Eastern Region has been completed by Aurora (1979) which is still unpublished. P.D. Saikia's work on the Socio-Economic Structure of a Dafla village deals extensively with swidden cultivation and the swidden economy of the Dafla tribes (Saikia, 1969). A doctoral dissertation by N. Saha on the Economics of Shifting Cultivation in Assam is another important work (Saha, 1970).

It may be noted that the International Symposium on Anthropology of Shifting Cultivation convened as a Post-Congress symposium of the 10th International Congress on Anthropological and Ethnological Sciences had inspired two major research projects in Orissa. One was undertaken by the Tribal and Harijan Research-cum-Training Institute under the Directorship of N. Patnaik who studied swidden cultivation intensively in three villages belonging respectively to Saora, Kondh, and the Hill Bhuiyan tribes of Orissa State. The findings of the study were presented at the symposium. Another research project was undertaken by L.K. Mahapatra, in collaboration with B.N. Sinha, on the "Social ecology of the persistence of shifting cultivation in Saora Hills". A paper based on this study was also presented at the International Symposium.

Apart from these published and unpublished major works, there have been a few publications in the nature of bulletins or brochures on swidden cultivation in India. The credit for the earliest publications in this type of regional surveys goes to H.F. Mooney who wrote

a *Report on Shifting Cultivation in Orissa* (1951). This is a pioneering and trend-setting work by an eminent authority on forests in India. Mooney presents an eye-estimate of the area affected by swidden cultivation, the ethnic groups or tribes involved, and the total number of peopel practising swidden cultivation in Orissa. Mooney had taken some effective steps before independence, as the Adviser on Forests for the Eastern States Agency, to re-settle swidden cultivators in farming colonies, which set the model for numerous resettlement colonies of swidden cultivators in Orissa and outside Orissa. His report includes studies on the geomorphology, ecosystem and the patterns and incidence of swidden cultivation in the endemic areas in Orissa State.

A similar exercise for the State of Assam was attempted by M.D. Chaturvedi and B.N. Uppal in 1953 which was published by the Indian Council of Agricultural Research.

This booklet by the former Inspector-General of Forests and Commissioner of Agriculture to the Government of India marks the watershed in thinking and evaluation by technical administrators before and after Indian independence. The authors had pleaded for understanding, scientific appreciation as well as caution in dealing with the problems posed by swidden cultivation in former Assam, that is, in Northeastern Frontier India as a whole. For the first time one finds a recommendation for improvement in soil fertility during the fallow years by inter-cropping swidden crops with a kind of wattle *(acacia mollissima)* on the hill tops, steep slopes, or even in the middle slopes for swidden cultivation practised by groups resisting change to alternative cropping or occupations. They also suggested that the hill tops and steep slopes of 45 degrees should be kept permanently under afforestation, and that the gentle slopes up to 10 degrees should be terraced and in between swidden cultivation should be permitted leaving enough land for the purpose, so that the cycle of rotation between two periods of cultivation is not less than 10 to 12 years.

D.C. Kaith, Director of Soil Conservation, Ministry of Food and Agriculture, Government of India, published a booklet on shifting cultivation practices in India in 1958 giving for the first time a survey and review of swidden cultivation in the country. The nature of land, ethnic groups, area and population involved in swidden cultivation, besides the crops raised and the suggestions for rehabilitation

of swiddeners or control of swidden, have been dealt with. Also the author has analyzed the problem of soil erosion caused by swidden cultivation and suggested a sound soil management programme to stabilize agriculture on the slopes, thus minimizing the harmful effects through different phases. However, the coverage of aspects in different states has not been of even quality.

The Tribal Cultural Research and Training Institute of Andhra Pradesh brought out a mimeographed brochure on Shifting Cultivation in Andhra Pradesh (1969). The brochure notes that swidden cultivation is fast vanishing from the tribal areas of Adilabad and Warangal districts but it is still practised to a limited extent in some areas in Khamaram and West Godavari districts, and is very much rampant in the forests and hills of East Godavari, Visakhapatnam and Srikakulam districts. Two modes of swidden cultivation are prevalent in Andhra Pradesh: *Chelkapodu* is the cultivation on plain jungle clearings and flat lands, whereas *Kondapodu* refers to swidden cultivation on hill slopes. Both modes involve rotation of swiddens and undergo the same cycle of operations. However, there is marked difference in the implements used. Hoe, digging stick, hand-axe and knife are used in *Kondapodu* but plough, crow bar and draught animals are used in *Chelkapodu.* In both the types of swidden cultivation several crops are raised.

In the 1970s one notices heightened interest in the forests and forest people, forest economy and the ecological hazards of deforestation. Some important conferences and seminars were organized by administrators, social scientists, and conservationists to discuss the issues related to these topics.

There was a national seminar on the Tribal Situation in India at the Indian Institute of Advanced Study, Simla, in 1969, which considered various aspects of the tribal situation and problems including swidden cultivation. The proceedings of the seminar bearing the same title were published in book form in 1972.

In March 1976, a seminar on Tribal Economy was organized by the Department of Economics, Northeastern Hill University, Shillong; the proceedings of the seminar was entitled *Some Aspects of Economy of the Hill Areas of the Northeast Region.* Several papers presented at the seminar discussed swidden cultivation in the Northeast Region.

Another seminar on socio-economic problems of swidden cultvation in Northeast India (with special reference to Meghalaya) was organized by the Northeast India Council for Social Science Research at Shillong in June, 1976.

The proceedings of the seminar are unfortunately not available. However, the list of papers presented at the seminar is given below.

General papers

1. The pre-historic background of shifting cultivation, by T.C. Sharma.
2. Shifting Cultivation: Is it a way of life? An analysis of my Garodata, by D.N. Majumdar.
3. Shifting cultivation: A plea for new strategies, by P.K. Bhowmick.
4. A positive approach to the problem of shifting cultivation in Eastern India and a few suggestions to the policy-makers, by Baniprasana Mishra.
5. Shifting cultivation: Maladies and remedies, by G.P. Gupta.
6. An integrated research approach to the problems of shifting cultivation with particular reference to Arunachal Pradesh, by B.N. Ganguli

Swidden cultivation and eco-system

1. Impact of shifting cultivation on wild life in Meghalaya, by S. Biswas & A.K. Ghosh.
2. Shifting cultivation and evolution of Flora, by S.K. Jain, P.K. Hajra & G.H. Bhaumak.
3. Plant pioneers in a Jhum field and their role in soil conservation and soil fertility, by R.P.M. Bordoloi.
4. Development and change in an area under shifting cultivation, by Saradindu Bose.
5. Management of land and water resources of Jhum-affected area of North-eastern region, by R.N. Rai.
6. Soil and water conservation technology for Jhum land, by A. Singh & R.N. Prasad.

Swidden economy

1. Practice of shifting cultivation in North-east India – A socio-economic study, by Satya Dev Jha.
2. Animal husbandry as a subsidiary source of economy for Jhumias, by D.J. Roy & A. Varma.
3. Alternative systems of farming for increasing productivity in Jhum lands, by D.N. Borthakur, R.P. Awasthi & S.P. Ghosh.
4. Settled agriculture in areas of shifting cultivation, by S.K. Mukherjee.

Rehabilitation of swidden cultivators

The problems of rehabilitation of the Jhumia families in the hill areas of Assam, by D.N. Bordoloi.

It is difficult to present any consolidated resume of the papers presented. However, we may point out one or two interesting aspects of swidden cultivation on the basis of these papers. T.C. Sharma has traced back the history of swidden cultivation to about 9000 years before our time. Majumdar notes that though the traditional Garo culture was in complete harmony with swidden cultivation, the Garo willingly adopted other methods of cultivation, when they found that swidden cultivation was inadequate to serve their purpose. "People in these areas of advancing Christianity, who have retained the traditional faith, have not found permanent cultivation incompatible with their traditional faith". Majumdar gives away the clue to this apparent paradox, as he notes that "most of such people still retain shifting cultivation . . . no major adjustment in their traditional religion has become necessary".

S. Biswas and A.K. Ghosh have pointed out in their paper that the mammalian wild fauna have been affected due to the reduced rotation cycle of swidden cultivation. 'The absence of green cover and destruction of the virgin forest cause serious disturbance in the territory of the wild animals and consequently they continue to make an attempt to survive initially retreating into the deeper forest but finally being left at the mercy of the exploiters".

The Himalaya Seva Sangh, New Delhi. devoted to the study of the problems of the states and regions in and fringing the Himalayas in the North and the North-east, organized two regional seminars and a national seminar on the People and Forest in 1976 and 1977 at Shillong Dehradun, and New Delhi. Problems of swidden cultivators and cultivation was also dealt with in these seminars Proceedings of the seminars have been published by the Sangha in 1979 in the

form of a book under the title *Man and Forest.*

A national seminar on Resources Development and Environment in the Himalayan Region organized in New Delhi in 1978 also devoted a session to discuss papers on swidden cultivation in the Northeastern region.

Mention must also be made here of the report of the National Commission on Agriculture, Volume IX of which relates to Forestry. In this report published in 1976 by the Government of India it is recommended that "shifting cultivation should be regulated, contained and replaced as expeditiously as possible by resorting to Agro-Silvicultural methods apart from other methods". It further recommends that "the main approach to the solution of the problem of shifting cultivation should be by permanently settling the shifting cultivators and weaning them away from the practice of shifting cultivation"

Social scientists and administrators organized yet another national seminar on Economic Development of Scheduled Tribes in April 1979 at the Tata Institute of Social Sciences, Bombay. Though it discussed the forest policy in general, control of swidden cultivation was also an important theme of the deliberations at this seminar.

The seminar focused on the "Harmonization of the interests of forest-dwelling tribals and the development of forest economy", in addition to three other aspects of tribal development Two papers were presented and discussed on the theme. Of these, the paper by B.K. Roy Burman on "The development of forestry in harmony with interest of the tribals", disputes the oft-repeated view that the tribals were solely responsible for the degradation of the forest. He points out that many tribal communities have taboo, and other customary restrictions against wanton distruction of forests. He expresses certain reservations about the basic orientation of the National Commission on Agriculture and the National Forest Policy and Programmes. In another paper on "Harmonization of tribal interest in the development of forest economy", M.N. Srivastava, Inspector-General of Forests, Government of India, presents a counter view. He deplores that the high rate of deforestation in Tribal areas does not cause concern in the minds of important expert committees or commissions. Further, he does not agree with those who assert the rights of tribals as the real owners of the forest domain. He claims that "production forestry" would be in the long term interest of the tribals as well as of the national economy.

Of particular importance to the students of swidden cultivation in India is the International Symposium on Shifting Cultivation organized by the Department of Anthropology, Utkal University, Bhubaneshwar, in December 1978 as a post-Congress activity following the 10th Congress of the International Union of Anthropological and Ethnological Sciences. Present at this symposium were specialists in swidden cultivation from all over the world who provided a good opportunity to Indian scholars to share their experiences and compare their findings. Unesco contributed to his symposium through its Man and Biosphere (MAB) programme by financing the travel of specialists from some countries from Asia. The idea of a cross-cultural comparative study on Swidden was proposed at this symposium which MAB/Unesco agreed to support and of which this study is a part.

At this Symposium twelve papers on India were presented as shown below.

1. Shifting cultivation and tribal policy, by S.G. Morab
2. Shifting cultivation in India, some problems and remedies, by K.S. Chandrasekharan
3. The economics of shifting cultivation in Northeast India, by Niranjan Saha
4. Production decisions in shifting cultivation – the Koya case, by N.K. Behura & P.K. Nayak
5. Viability of traditional alternatives to shifting cultivation in Saora Hills, Ganjam District, Orissa, by L.K. Mahapatra.
6. A comparative study of crop production under shifting and settled cultivation in the hill areas of Northeast India,by P.C.Saikia
7. Control of Shifting cultivation and rehabilitation of tribals, by N.R. Panigrahi.
8. Shifting cultivation in Orissa. by N. Patnaik
9. Rationalisation of shifting cultivation in Orissa, by C. Patro & R.N. Behera
10. Estimation of area under shifting cultivation in Machkund Catchment by remote sensing, by B.K. Ghosh, K.N. Chari & G. Mahapatra
11. Manual interpretation of ERTS-I (land SAT - I) imagery for assessment of area under shifting cultivation in the district of Keojhar, Orissa, India, by K.N. Chari, N.C. Pandey, G. Mahapatra & C. Patro

12. Shifting cultivation in Orissa with special reference to Phulbani District, by C.S. Dani

It will be useful to provide a brief resume of the papers presented at the symposium by the Indian specialists.

S.G. Morab described the mode of swidden cultivation among the Soliga of Karnataka State and analysed the shifts in government policy regarding forests and the practice of swidden cultivation. He has suggested in his paper continuation of swidden in earlier occupied areas along with granting of land for permanent settlement and promotion of terrace cultivation and settled irrigation.

K.S. Chandrasekharan deals broadly with the suitability of swidden cultivation in different ecological conditions. However, the carrying capacity of land, methods of swidden cultivation and some of the policy measures by governments and committees are also mentioned by the author. He emphasized the need to organize research on "aspects relating to improvement of shifting cultivation and this should cover choice of better seeds to be used for mixed farming, techniques of mixed and relay cropping, selection of appropriated legumes, study of their nitrogen fixing capacity, nutrient requirements of different crops in the local situation, tillage practices. . . accompanied by adequate training and extension effort".

Saha underlines the importance of swidden cultivation in the Northeastern Region of India (that is, Assam, Meghalaya, Manipur, Tripura, Arunachal Pradesh, and Mizoram) from which he draws generalizations on the theme of the paper. He deals with certain peculiar characteristics of swidden cultivation like the impact of nature on swidden cultivation, crop husbandry, division of labour, and swidden cultivation as economics of factor utilization, land utilization, man-days utilization in swidden cultivation and above all the average area under swidden. He has analysed the extent of production per hectare of land in the villages studied.

The paper by Behura and Nayak discusses the impact of various factors in determining production from swidden land. Based on their data from the Koya tribe they challenge the usual assertion that the practice of swidden cultivation is unproductive and not fairly rewarding. The paper shows how the Koya population, the ecological niche of the territory of Koya habitation, the culture of the people, the headman of the village in swidden cultivation, and religion play important role in moulding the pattern of swidden cultivation practices. The household economic structure and division of labour

and exchange of service are interpreted to have a clear idea about the Koya economy. They give a detailed account of swidden cultivation such as crops, cropping pattern, rotation of crops, implements used in swidden cultivation, processing and storing.

L.K. Mahapatra's paper focuses on the productivity of swidden land in Saora Hills in a comparative study of per acre yield of paddy from swiddens, single crop agriculture, double-crop agriculture, upland cultivation, terraces and kitchen garden and the dependence of the villagers on swidden cultivation in spite of alternative opportunities of earning a livelihood. Further, the highest average yield per acre and its estimated money value are presented.

P.O. Saikia has devoted his paper to Northeast India in general and to a village in Meghalaya in particular. Production of crops per hectare of swidden cultivation in five hill villages of Northeast India is analysed in the paper from which it is concluded: "An attractive and remunerative alternative to shifting cultivation with high yielding variety seeds and implements suitable to hilly areas is to be evolved for weaning away the shifting cultivators from the primitive modes of production".

N.R. Panigrahi analyses the extent and operations of swidden cultivation and presents a logical interpretation of the factors concerning the practice of swidden cultivation. He argues that swidden cultivation practice is a "logical and economically justifiable form of land use wherever there is a large amount of land and primitive economy exists," and that it is ecologically viable if after each occupation the fertility of soil is regained. He suggests that since the family labour and hill slopes are the only assets of the tribals, the strategy should aim at developing a stable system of agri-horticultural production in these hill slopes through labour-intensive schemes, organized processing and marketing facilities.

Nityanand Patnaik has, in his paper, tried to differentiate between the patterns of swidden cultivation in North Orissa and South Orissa. The techniques of clearing the forest, firing, nature of cropping and harvesting in North and South Orissa are broadly described. Also described are the procedures like distribution of land, forest clearing, sowing, weeding, watching, and harvesting among the Bhuinya and the Kondh tribes which have been studied for this paper.

C. Patro and R.N. Behera discussed in their paper the measures to rationalize swidden cultivation in Orissa. In doing so, they consi-

dered the extent of the area under the measures like land reclamation, development of irrigation sources, introduction of plantation crops, introduction of spices and other fruits and a conservation cropping plan, introduced by the government to induce people to give up swidden.

The paper on Estimation of area under shifting cultivation in Machkund Catchment by remote sensing by B.K. Ghosh, K.N. Chari and G. Mahapatra attempts to estimate the area under swidden cultivation in Machkund area through the remote sensing method. The paper's contribution was mainly methodological.

Another methodological paper was by K.N. Chari, N.C. Pandey, G. Mahapatra and C. Patro which highlighted the discrepancy in area estimation by H.F. Mooney(1951) and by the Indian Council for Agricultural Research (1958). Feeling the urgency of accurate estimation of land under swidden cultivation, the authors recommended a new technical procedure of manual interpretation of black and white imagery from the earth resource technology satellite method renamed as land Sat-I.

C.S. Dani described the practice of swidden in the Phulbani district of Orissa. It is a descriptive account of the practices which concludes with a set of recommendations.

Viewpoints on Swidden

While full length studies on swidden cultivation, or even all-India surveys to measure its extent are few, one comes across several references to this practice in the writings of social scientists and the administrators. This practice has generally been regarded as problematic and efforts have been made to abolish it. In the literature on this "welfare" aspect of the institution, opinions are divided. On the one hand, there are those interested in the tribal cultures who oppose outside intervention and argue for the retention of the practice; and on the other are those – mainly administrators and social workers – who regard the practice as evil and responsible for environmental degradation and argue for its abolition. A representative sample of views and suggestions culled out from the various studies and reports is presented in this section.

Since about 1858, administrators have taken cognizance of the problem of swidden cultivation and have prescribed various measures to wean the people from it. Nag observes that "it is clear that the decision of stopping Bewar was taken by 'untrained' forest officials in the so-called messengers of civilization" (Nag, 1958: 77). Besides administrators, trained forest experts, agro-botanists, agronomists, and soil conservation experts have discussed this problem and recommended various measures to minimise the evil effects of swidden cultivation. Later administrators and planners—especially after the country became independent—and several Commissions on Agriculture beginning with the Royal Commission on Agriculture (1928), the Planning Commission and the Commissioner for Scheduled Castes and Scheduled Tribes, have recommended various solutions from time to time. Though social scientists came to the scene rather late, Varrier Elwin in respect of the Madhya Pradesh and Orissa tribes, and Christoph von Fuerer-Haimendorf in respect of the tribes in the princely state of Hyderabad were the first social scientists to have written about the problem of swidden cultivation. Some administrator-cum-anthropologists like J.H. Hutton, J.P. Mills, and W.V. Grigson have also contributed to the understanding of the practice of swidden cultivation and of the problems connected with it; they also made several recommendations.

It will be impossible to reproduce here the plethora of recommendations and measures in respect of swidden cultivation in India. However, it is necessary to provide a sample of these recommendations by experts, administrators and planners, and social scientists in order to present not only the difference in views between these categories of people concerned with swidden cultivation but also the shifts in their perception and thinking from time to time.

Action-Oriented Studies

Interest in the practice of swidden cultivation was largely governed by the concern of administrators and planners about the deterioration of the environment and destruction of the forests. Several studies and reports on swidden have been carried out with an action orientation – describing the evil effects of the practice and sug gesting alternative ways of cultivation to minimise the damage to

the forests. As an illustration of this concern read the following remark by Forryth:

"This system of cultivation, if it can be called by that name, was of the most precarious nature. . . The dhya cultivation practised throughout the hills of the Central Region was almost in itself sufficient to have proved the ruin of the forests, but other causes had also unfortunately supervened. The most valuable timbers for railway construction and other purposes at the time were the teak and the sal" (Forryth . . .-82-83 as quoted in Nag. 1958: 76).

As a result of such view of the forest officials the Central Provinces prohibited shifting cultivation in 1867. The Baiga were given land and other assistance to switch over to settled cultivation.

M.L. Bor, a Botanist of the Forest Research Institute, Dehradun had opined in his presidential address to the Botany Section of Indian National Science Congress in 1942 that "of all practices initiated by Man, the most obnoxious is that of shifting cultivation". He attributed the cause of soil erosion in the Assam Hills to the practice of shifting cultivation (see B.G. Gohain, 1953: 256). Another expert, Sir S.H. Howard, Inspector General of Forests, Government of India, while dealing with swidden cultivation held a different view, and recommended that, instead of preventing this method of cultivation, a trial should be given by regulating it, which means that if a longer period of rest were given between the fellings, there was little danger of soil erosion (B.C. Gohain, 1953: 256). D.N. Borthakur developed his suggestions rather elaborately on "alternative systems of farming for increasing productivity in Jhum lands" in Northeast India. He observed that "shifting cultivation has been rightly held responsible for crippling the economy of the people of the region. . . ." But he pointed out that *Jhumming:* (swidden cultivation) is the outcome of age-old tradition and thus has become the way of life; therefore, people would not like to part easily with it. Secondly, any improved technology, in his opinion, should be such that could cater to the needs of the people and is easily accessible and acceptable to them. He has visualised measures of improvement for increasing the productivity of Jhum land and suggested alternative systems of farming to replace *Jhumming* by permanent cultivation, as the ultimate solution to the problem of swidden cultivation. Among the steps for increasing the productivity of Jhum land he prescribes some short-term measures like proper land use planning based on land capability: (a) passification; (b) checking soil and fertility loss; (c) adoption of mechanical measures such as puertorican type of terracing, half-moon terracing, levelling system and

partial terracing, water disposal system and water harvesting technology; (d) adoption of soil management practices such as cover crops to provide canopy, stripe and mixed cropping, relay cropping, green manuring; and (e) improving productivity through crop management practices such as improved variety, crop planning, use of manures, chemicals and fertilizers, weed control, water management, plant protection and use of suitable implements. Borthakur outlines the long term measures for improving productivity in swidden land through (a) study of rainfall pattern; (b) physiographic study of development of terraces; (c) water conservation; (d) cropping pattern; (e) testing of suitable implements; (f) studies on effects of burning; and (g) through building up soil fertility by introduction of leguminous plants like acacia during the fallow period.

Borthakur recommends the following alternative systems of farming to replace *Jhumming*: agriculture by terracing one-third of the bottom area of the hills, horticulture for raising food crops like citrus, banana, pineapple, guava and some temperate fruits like peach, plum, pear and apple at higher altitudes. He also notes that different vegetable crops, tuber crops like tapioca (cassava), colocasia, dioscorea, sweet potato and plantation crops like areca nut, black pepper and coffee are being cultivated successfully in this region and their scientific cultivation may become quite remunerative.

As an intermediate step prior to the permanent settlement of the swidden cultivator, two types of farming practices are recommended. Like the cropping pattern followed in West African humid tropic belts, in lower altitudes of the Northeastern hills long growing starchy crops like tapioca (cassava), colocasia, dioscorea, fruit crops like papaya, banana (Cavendish group), and vegetable crops like chillies, sweet gourds and beans may be planted during the late growth phase of the first cereal crops. As a result of the mixed planting at the time when the first crop is ready the vegetative growth of the second crops will form a protective soil cover. Some of the second crops will be ready by the second year while the remainder may be allowed to grow further for 3 to 4 years to be harvested as required. This system will help reduce leaching and percolation of nutrients, will reduce the losses due to sheet-erosion, and will help develop a litter layer on the surface. The short duration horticultural crops mentioned above will also help transfer subsoil nutrients in the topsoil, thus the advantages of fallowing for the period of 4 to 5 years may be attained to a great extent through this alternative system with additional income for the Jhumias.

As for the long term solution through permanent settlement of the swidden cultivators in settled agriculture, Borthakur recommends

that the upper portion of the hills above 30 per cent slope be covered permanently with perennial horticultural crop species with suitable inter or comparison crops. In the low hills (after 900 metres) fruits like citrus, pineapples, banana, guava and leechi, in medium hills (900-1500 metres) stone fruits like peach, plum, apricot, pear and persimmon, and in high hills (above 1500 metres) fruit crops like apple, pear and chestnuts may be cultivated. Shallow-rooted leguminous crops which may develop thick-soil cover during early monsoon period are considered ideal as inter-crops for this region. Development of animal husbandry, fisheries, and poultry faming are recommended as sources of subsidiary income as well as for infusing the idea of permanent settlement in the swidden cultivators.

While on the subject of improvement in the productivity of the swidden land, it is quite in order to focus on the few studies on the effects of burning on the soil and the plant regeneration cycle. R.P. Awasthi (1975) has observed that the pH of the soil rises as a result of burning, which is supposed to lead to increase in yields. Similar ly, R.P.M. Bordoloi observed the appearance of the blue-green algae covering the swidden after about three weeks of burning. He concludes: "With their soil-binding, water-absorbing, and water retaining ability together with contribution of organic matter, the whole medium is completely altered and made suitable for other plants to follow. But the most outstanding contribution of these plants towards fertility of the soil is their ability to fix free atmospheric nitrogen in the soil and thereby make it rich in nitrogen which is so vitally important for any plant growth". He, therefore, recommends that in the short-term when other alternatives cannot be offered to the people who solely depend on swidden cultivation, means should be devised so that the dry belt soil such as in a Jhum field can be quickly reclaimed. He suggests that suitable algae species be cultured *en masse* in laboratories near the swiddens and swiddens be inculcated with these cultures for a quick growth of algae which will then take care of the problem of soil conservation by reclaiming such soil.

D.N. Borthakur et al in the more recent paper on "Agro-forestry based farming system as an alternative to Jhumming" presented at the seminar on Agro-Forestry in May, 1979, proposed a system of agro-forestry on the hill slopes for replacing swidden cultivation. The lower one-third portion is to be devoted to agriculture on bench terracing, and the one-third medium portion to hortipastoral plants and the top-one-third portion given over to forestry. The authors claim that the "system will least interfere with their socio-

cultural system. Initially, even burning of the 65-70 per cent of the lower slopes of the hills can be allowed before developing the lower terraces". Although this agro-forestry system has been advocated as an immediate measure in this paper, this agrees more with the proposal of Chaturvedi and Uppal (1953) than with the earlier paper by Borthakur (1979).

> The notion widely held that shifting cultivation is responsible, in the main, for large-scale soil erosion needs to be effectively dispelled. The correct approach to the problem of shifting cultivation lies in accepting it not as a necessary evil but recognizing it as a way of life, not condemning it as an evil destructive practice but regarding it as an agricultural system evolved as a reflex to the physiographical character of land. For too long, Jhumming has been condemned out of hand as a curse to be ashamed of, a vandalism to be decried. This attitude engenders an inferiority complex and unhealthy atmosphere for the launching of any development scheme seeking to improve the current practice.

They advocated that on a hill under swidden cultivation alternating with silviculture, the top be afforested while the lower portion be terraced in gentle slopes. In the middle portion where swidden cultivation was to continue for the present, they suggested that crop-planning and silviculture should be so designed as to make full use of the inherent fertility and to restore it when exhausted.

N.R. Panigrahi is also of the same opinion. He says that "Shifting Cultivation is a logical and economically justifiable form of land use, wherever there is a large amount of land and primitive economy exists. From a social point of view, no objection can be raised if after each occupation the fertility of the soil is regained. Shifting cultivation from an agricultural point of view is not also objectionable so long as vegetation and the fertility of the soil are restored by nature" (1978). He emphatically argues that permanent agriculture depletes the land even more than swidden cultivation does under low population pressure. He refers to the increasing salinity and swampiness of the lands benefitted through irrigation from Bhakra Nangal and Hirakud dam projects and the area put out of cultivation in this process might go up to one fourth of the total irrigable land. Panigradhi recommends a cautious approach adapted to the swidden cultivation cycle. He says:

> To wean away the tribals from *Podu* cultivation will not be possible so long as an alternate economic

> cropping in the hill slopes is demonstrated to the tribals. It is proposed that in the second year of the *Podu* cultivation the tribals will be persuaded to plant appropriate food plants under the *in situ* method. Such planting in the second year will not interfere with the usual cultural operation of the annual crops grown in the hilly slopes. It is hoped that with minimum amount of after care and side grafting *in situ*, the fruit plants in the *Podu* hill slopes will come to bear within 5-7 years so that when the tribal comes back for his second cycle of *Podu* in the particular patch after 8-10 years the value of the fruit produced from the *Podu* hill slopes will be more than that of the cereals and pulses grown in the *Podu* land. It is expected that the tribal farmer because of his love for fruit plants and the higher economic value of fruit produced in comparison to the usual cereals and pulses grown in the *Podu* land, the fruit plants will not be cut and the tribals will be weaned away from *Podu* cultivation.

C.S.Dani, refers to the evil effects of swidden cultivation on soil, on vegetation and wild life, on hydrological regime and climate and on the people concerned and the country as a whole. But he cautions that before formulating a scheme for effectively stopping swidden cultivation, it is absolutely necessary to determine the area affected by *Podu* Cultivation and the tribal people associated with it. Aerial photography coupled with field investigation should be used to determine the extent of the problem accurately. He recommends the *Tangya* system of agro-silviculture, provision of alternative economic pursuits, permanent settlement, and providing facilities for taking up subsidiary occupations, and, above all, effective education for the swidden cultivators. C. Patro and R.N. Behera, argue in their study that:

> The mountainous topography where shifting cultivation is practised demands a well planned and rational land use for improving the standard of living of the shifting cultivators. Thus, the control measures may include land development or development of irrigation sources to provide supplemental irrigation to cultivated lands or introduction of plantation crops of economic importance and introduction of improved cropping pattern. Comprehensive land use programme on watershed basis has to be attempted to treat the land according to its need to prevent further deterioration due

> to soil erosion and to use the same according to its capacity for maximising production on a sustained basis" (Patro and Behera, 1978).

W.V. Grigson, Aboriginal Tribes Inquiry Officer, made an extensive inquiry in the Central Provinces in 1947 and found that additional swidden could be given to the Baiga both outside and inside the Baigachak. He suggested that "Regulated *bewar*, never for more than two consecutive years on one plot in this limited Baiga country, may be a sounder form of agriculture than an attempt to compel the Baiga to raise crop on the wretched inadequate *Barra* fields allotted to them in the Chak" (Nag, 1958:86).

Like Grigson, another administrator-cum-anthropologist, J.P. Mills, who had a long experience of administration and ethnographic work in the Naga Hills, had recognized that the tribal people could not be easily weaned away from swidden cultivation. Moreover as against the views of some experts of the 19th and 20th century, Mills had observed no serious ecological deterioration in the hills of Assam and Nagaland where swidden cultivation had been practised since time immemorial. He, therefore, opined that if wisely regulated, the *Jhum* type of swidden cultivation could be carried on indefinitely without any serious damage to the environment or nation's interests (see Gohain, 1953: 256). It is very interesting to note how another administrator-cum-anthropologist colleague of J.P. Mills, J H. Hutton, holds almost the contrary view, in spite of the fact that both were equally exposed to swidden cultivation in Assam and Nagaland Hills. Hutton asserts that, "the practice of swidden cultivation is uneconomic and detrimental to the interest of the Indian community as a whole, except perhaps in certain limited areas and under conditions of strict control".

M.S. Shivr..man, adviser to the programme Administration of the Planning Commission, observed in 1957 that:

> It is a mistake to assume that shifting cultivation in itself is unscientific land use. Actually, it is a practical approach to certain inherent difficulties in preparing a proper seed-bed in steep slopes where any disturbance of the surface by hoeing or ploughing will result in washing away the fertile top soil. The tribal people, therefore take care not to plough or disturb the soil before sowing. The destruction of weeds and improvement of tilth necessary for a proper seed-bed are achieved with the help of fire. . . In most of the interior areas,

> where communication is not developed and not sufficient land suitable for terracing is available, *Jhumming* alone can be done for the present and as such every effort should be made to improve the fertility of the *Jhummed* land.

In order that restoration of soil fertility may be achieved soon after the second year's harvest on swidden land, Shivaraman recommends growing of perennial red gram (Arhar) in the third year when the swidden is left fallow 12 inches (30.5 cm) apart along the contours of slopes and in rows 4 feet (1.2m) apart. Besides, in every acre (0.4 ha) about 2 pounds (1 kg) of seeds of *calapagonium Nseuroides*, a very fast growing leguminous creeper, may be sown when the arhar is about 3 to 4 weeks old so that the calapagonium may form a thick matted growth within two months, preventing soil erosion completely and suppressing weeds and grasses. He asserts that this was tried with success for putting down weeds and grasses in areas of heavy rainfall like Malabar, South Kanara, and drought affected agency portions of Visakhapatnam district in 1952-53. As calapagonium dries up in December and January, it can be destroyed by fire before sowing other crops (Report of the Committee on Special Multipurpose Tribal Blocks, pp-48-49, 51).

B.D. Sharma developed his recommendations on swidden cultivation based on his administrative experience not only at the rational level but also at the micro-level, among the Abujhmaria of Bastar district in Madhya Pradesh. He observes that the local population in the Abujhmar region cannot be expected to change its traditional economic pursuit within a short period. However, he notes that there is good potential for settled cultivation, horticulture, and for cattle rearing in some areas in Abujhmar region.

> Shifting cultivation may co-exist for some time but as greater income accrues from horticulture and cattle rearing, there will be lesser dependence on shifting cultivation as the primary economy activity. A greater contact with the Extension Agency in regard to these three areas can be used for using the potential for shifting cultivation on suitable lands. It may, therefore, be possible to slowly induce the community to meet its field requirements from settled cultivation and other needs from horticulture and cattle rearing (Sharma, 1978: 46-47).

K.S. Chandrasekharan asserts:

> Any value judgement on shifting cultivation cannot be based on cold logic or economics and has to take into account the human consideration involved in taking the problem of providing alternative means of livelihood to the large population who are following shifting cultivation as a way of life. There is considerable force in the argument that, for no fault of their own they have been relegated from the status of the masters of their surrounding to that of a refugee in their own habitat (1978).

Writing about the people of the Northeast Frontier Agency (NEFA) Verrier Elwin observed that,

> Shifting cultivation *(Jhumming)* . . . is closely linked with their mythology, their social customs and even their religion. The administration has wisely refused to forbid the practice, which in some states has been stopped altogether to the distress and indignation of the tribesmen. It is probable that the evil effects of *Jhumming* erosion and destruction of the forest have been exaggerated for if sufficient rotation is allowed, and in a thinly populated area like NEFA there is no reason why there should not be a long period for rotation, the forest recovers well enough. And in many parts it is unlikely that it will ever be possible to find a substitute, the hills are so steep and the water scarce (Elwin, 1957: 21-22).

D.S. Nag has discussed at length the controversy on swidden cultivation. He quotes Jacks & Whyte with approval: "It must be admitted that no agricultural system except shifting cultivation has yet been devised that will ensure lasting stability and fertility to tropical forest soils under human management" (1958: 90). Nag says: "Often the system of agriculture is the result and not the cause of social progress. Development of means of transport and irrigation have been found to have changed the character of agriculture in any part of the world. Therefore, it is necessary to first change the socio-economic environment of the axe-cultivator instead of changing the system of cultivation only" (Nag, 1958:93). While the *Bewar* system is peculiarly suited to the requirement and aspirations of the Baiga and there were some areas where bewar can be extended, Nag (1958:96-99) recommends that:

1. only mixed or bamboo forests should be felled for *bewar;*

2. the Baiga must be made to realise their duties in regard to forest protection and development; and
3. as it is neither practicable nor desirable to isolate the Baiga or make them subsist on shifting cultivation for all time, the Baiga are to be encouraged and assisted to gradually take to regular plough cultivation.

Fuerer-Haimendorf recommended that the Reddis in the hilly tract of the Godavari Gorge in Andhra Pradesh be allowed to practise swidden cultivation over eight times the area actually occupied by current swiddeners, so that there would be enough land for rotation (Haimendorf, 1945: 308).

Surveying swidden cultivation in Orissa, L.K. Mahapatra (1953: 265-277) pointed out two alternate broad solutions: (a) giving land to all swidden cultivators for settled cultivation which is obviously impossible except perhaps in some parts of Assam (which included Arunachal Pradesh, Maghalaya, Nagaland and Mizoram in 1953) and north Orissa, and (b) giving land for settled cultivation to those who are willing to come down and also offering them other opportunities of alternative employment in fruit gardening (after controlled swidden cultivation) and other arts, crafts, occupations in their habitations on the hill slopes or in the valley below. He proposed implementation of controlled swidden cultivation by undertaking legislative measures, scientific surveys, rehabilitation measures for improvement of swidden cultivation and for betterment of the swidden cultivators settled in agricultural colonies besides other anciliary measures on social education and innovation extension. In another paper, L.K. Mahapatra (1978) examined the viability of traditional alternatives to swidden cultivation in Saora Hills, Orissa and came to the conclusion that there was very little total dependence on swidden cultivation by the households in the four villages studied, primarily because other sources of livelihood were available for raising cash crops and cereal crops. He also found that the money value of the total produce from swiddens was in general higher than that of terraced cultivation and low land cultivation practised by the same Saora families. He prosposed a number of hypotheses for further investigation with regard to alternative means of livelihood in place of swidden cultivation.

In an earlier study, L.K. Mahapatra found that among the Saoras swidden cultivation serves as a safety valve for those dispossessed by mining, industrial locations or who are landless and are dependenton it for their sheer survival (1960).

B.K. Roy Burman, in a paper on the development of forestry in harmony with the interest of the tribals, observes:

> Rather than getting away from shifting cultivation, one is to look into shifting cultivation itself for a solution. Shifting cultivation is not a homogenous practice. Different practices have different implications for productivity and soil and water management. Many tribes build rudimentary contour bunds across the slopes in shifting cultivation fields. Again many cut field channels. It is because of bias against shifting cultivation that such practices and continuous innovations are not even reported. A quick documentation of the same should be made all over the country. The shifting cultivators should be encouraged to adopt the improved practices on a wider scale and to invest the surplus in farm forestry and in growing their own firewood, fodder, housing materials etc. Thus, the growth should be primarily from within and not from without (Roy Burman 1979).

Roy Burman notes that schemes of settling swidden cultivators in the plains for permanent cultivation and programmes of large scale terrace cultivation had been taken up in many areas, though many of them had been costly failures. "Currently horticulture and coffee and other cash crop plantation is being advocated as the panacea. . . Horticulture is a capital intensive enterprise; and though it is expected to yield high profit, the risks of suffering heavy loss due to the vagaries of nature and caprices of the market are also quite considerable ' (1979).

P.D. Saikia believes that:

> Terrace cultivation is proved to be successful in some parts of Northeast India, specially in Angami and Chakesang areas of Nagaland and some parts of Manipur. But in certain ecological settings terrace cultivation should not be considered to be the proper substitute to shifting cultivation. It is observed that there is nothing in the findings of the case studies that can be interpreted to mean that the hill tribals are inherently averse to change or slow in adjustment any more than the general village folk in this part of the country. An attractive and remunerative alternative to shifting cultivation with high yielding variety seeds and implements suitable to the hilly areas is to be evolved for weaning away the shifting cultivators from the primitive mode of production (1978).

N. Saha (1978) feels that Swidden cultivator:

> Survives in the present form, not due to any inherent virtue of the system, (but) due mainly to the absence of viable alternative to the people. It has been observed that a section of the *Jhumia* (swidden cultivators) has made considerable progress towards settled living and sedentary agriculture, may be due to incentives available with the development of communication, transport and marketing facilities. The problem of *Jhumming* . . . in the ultimate analysis is more economic than cultural. It is more connected with the question of transforming traditional agriculture through technological change. A planned and directed change in the social and economic life of the *Jhumias* will require building up of adequate infrastructure conducive to economic growth. . .

Writing about the Koya of Koraput district in Orissa, N.K. Behura and P.K. Nayak comment:

> Due to openness of the society and economy to the outside world and due to the fact that most of the lands are flat and not hilly, the Koya are abandoning swidden cultivation rather fast. They are at the same time being afraid of losing land due to the large scale reclamation of land by the Dandakaranya Project for the Bangladesh settler families. This had provided them a strong sense of retaliation to convert the previously abandoned land into prepared cultivable plots so that they can claim possession right over the land before the concerned authority.

But strangely, the Koya, young and old, who returned home from Assam where they had gone to work in tea gardens resorted to the traditional mode of cultivation, including swidden cultivation, introducing no innovations against expectation.

A review of the existing literature on Swidden in India leads one to believe that there is a trend towards sympathetic consideration of the practice, as against the extremist view held in the past by administrators which regarded the practice as bad and undesirable. Swidden is now viewed merely as "a way of life," a cultural mode of living rather than a mere mode of production. The need is emphasized to relate this "economic" practice with the totality of culture lived by a tribal community. It cannot be understood in isolation. It is argued by some that the evil effects of swidden cultivation on ecolo-

gy and natural resources stem out of a much higher population pressure on land resulting in reduced availability of land, and depletion of forest resources.

However, there seems to be a general agreement that swidden cultivation will ultimately be substituted by permanent cultivation, horticulture, afforestation, and adoption of alternative diversified occupations.

While all the experts do not indulge in wishful thinking that the swidden cultivators could be weaned away from swidden cultivation in 10 to 20 years, a body of planners in 1973 came up with a proposal to bring about rehabilitation of swidden cultivators by transforming them into permanent cultivators or horticulturists in a span of 10 years only. This has not been possible.

Some technical experts, some planners and administrators, and many social scientists (especially anthropologists) have taken up the position that as a short term measure the technology of swidden cultivation should be improved to ensure higher yields. The improvement in their economic position through such a measure will enable the swiddeners to take up terracing, horticulture, or any other undertaking.

Comparative studies of productivity of swidden cultivation as a mixed crop undertaking with settled agriculture as a monocrop undertaking do not unequivocally support the view that the produce from permanent cultivation is always of higher money value, stable in yield, or less affected by agricultural hazards.

Summary Appraisal

Interest in Swidden cultivation in India is as old as interest in the study of tribal cultures of this vast subcontinent and it dates back to the emergence of British rule in India. Much of what was written on swidden (called shifting cultivation then) is in the form of notes, memoranda and memoirs of the British administrators who were sent to these territories for purposes of administration. These were followed by Christian missionaries who also wrote detailed accounts on tribal customs and practices. The Imperial Gazetteers of India and the District Gazetteers published in the late 19th cen-

tury provide the first dependable accounts of swidden; these are, however, based on what the officers "observed" during their "tours" and what they were told in their "circuit house interviews" with knowledgeable informants. "The tribes and castes" series covering different regions of India, and the notes of census commissioners are the other sources of information relative to swidden cultivation.

Among the social scientists, it was the anthropologists who contributed a good deal to the understanding of the practice of swidden cultivation. Being identified as "students of tribes" the anthropologists were perhaps the pioneers in presenting systematic accounts in their ethnographies which invariably devoted a chapter to the economic life of the tribe studied. In the initial phase, thus, both the administrators and the anthropologists -- who wrote on swidden -- were of foreign origin, mostly British. In the late 1940s and early 1950s more Indian anthropologists started tribal research and reported on swidden. It is only very recently that scientists from other fields have begun work in tribal areas, and their number is too small.

There are few full length monographs on swidden cultivation as such. As was said before, reference to swidden is to be found in ethnographies. However, the number of papers published in research journals, or presented in seminars on this topic is quite substantial.

The interest shown by government in the 1960s and 1970s in tribal welfare has highlighted the problem of swidden cultivation. Departments of agriculture and forestry institutes engaged in agricultural and agro-economic research, and the departments of anthropology in the universities of Bihar, Orissa, West Bengal, Madhya Pradesh, Assam and other northeastern states are now paying greater attention to this institution. It is evidenced by the seminars organized to discuss this problem in the 1970s.

In the study of swidden cultivation three approaches have been followed:

(1) Anthropological approach characterized by intensive small-scale observation and interviewing with schedules and a longer duration of stay in swidden villages. In recent years, anthropological writings have tended to be more quantitative, supplementing observational data with secondary statistics and other materials.

(2) Survey approach Such surveys have appeared in the form of regional or all-India studies on swidden cultivation.

(3) Comparative and quasi-intensive approach. The comparative study of the socio-economic impact of programmes of control on swidden cultivation in Northeastern India by Arora is based on

both extensive and intensive studies. Similarly, the report on shifting cultivation in Orissa by N. Patnaik combines the macro-perspectives with intensive study in three villages. Similar in approach is L.K. Mahapatra's study of swidden cultivation in four Saora villages, where a comparison has been attempted not only between the four villages but also between alternative modes of production and means of livelihood as carried on in these four villages in addition to swidden cultivation. The study is designed to arrive at empirical generalization on the viability of alternatives to swidden cultivation in the Saora Hills.

What the technical experts have been writing on the effect of burning, the composition and the nature of soil, on the vegetation growth in a burnt swidden and on the impact of swidden cultivation on soil erosion is based on laboratory and field observations following natural history methods. Their studies are not oriented towards wider generalization. These studies are yet to take up a comparative framework between regions.

Apart from exploratory and descriptive studies by both social scientists and natural scientists on the problems of swidden cultivation, problem-oriented experimental studies are not yet evidenced among both the categories of scientists. Apart from the broad objectives of a research project, there is not much evidence of hypothesis construction at the beginning of the study. However, the paper of L.K. Mahapatra, based on a research project, has yielded a number of hypotheses. These may be worth reproducing.

i) The households which are immigrant, or incapacitated or do not own or occupy sufficient terrace or lowland or upland fields or permanent cultivation, tend to depend exclusively on swidden cultivation.

ii) The households which own or occupy sufficient terrace or lowland or upland fields, or which grow an appreciable quantity of cash crops or which have got permanent jobs away from the village earning them sufficient money for the maintenance of the family, tend to practise swidden cultivation only to supplement their income. Such people will be more prone to abandon swidden cultivation altogether for lack of manpower.

iii) The households which are accorded a higher status as *Shudha Saora* tend to abandon swiddening which is associated with the Lanjia Saora of lower status.

iv) As more and more terraces are being constructed along the hill slopes, on the upland (Padar) and as raising of cash crops on permanently owned plots of lands are on the increase, and job opportunities are growing through education or labour contracts, less and less number of households tend to depend on swidden cultivation.

v) Because of the government restricting the area of land available for swidden cultivation, more and more households tend to diversify their sources of livelihood.

vi) In spite of all the available opportunities of traditional and recently introduced alternative sources of income swidden cultivation still produces a variety of crops and products, which under favourable conditions tend to equal or exceed the money value of the products derived from any form of permanent cultivation on the same size of land.

vii) Though the traditional means of livelihood, other than swidden cultivation, are not equally developed or available in all the villages of the Saora land the potentiality of terrace cultivation to absorb more households will increase to the extent such means are equitable, accessible, or made available to many of them.

Testing Generalizations and Conducting Further Studies

The review of literature suggests that while scholars have not come up with many researchable hypotheses, they have made several generalizations which need to be tested. Some of the more prevalent generalizations are called out from the literature and listed below:

1. The area under swidden cultivation has shrunk progressively.
2. Population growth has reduced the land-man ratio.
3. The swidden cycle has been reduced to 3-6 years, compared to 20-30 years in the past (especially in the Northeast Region).
4. Productivity of swidden land is lower in comparison with that of terrace cultivation and permanent cultivation.

5. Food is not sufficient "to make both ends meet" for most of the year.
6. Forest produce is used for more survival for several months of a year.
7. Deficiency in food leads to various malnutrition-induced diseases.
8. Living exclusively on fruits or on roots leads to various gastric disorders.
9. Swidden cultivation causes greater soil erosion than ploughing in permanent cultivation under a traditional technological set-up.
10. Burnt swidden destroys fertility, and brings about other harmful changes in soil which inhibit higher productivity and promote higher weed growth.
11. Swidden cultivation technology is wholly unscientific, hence uneconomic or deleterious for the environment.
12. Some swidden cultivators have themselves switched over to other occupations or other forms of cultivation. Hence the pattern of dependence on swidden cultivation may vary from region to region, from one ethnic group to another, from one section to another in an ethnic group.
13. Subsidiary or alternative occupations adopted are not viable to ensure minimum standards of living.
14. As swidden cultivation is labour-intensive and family labour is the most important factor of production, there is a premium on large family size and hence swidden cultivation is a deterrent to family planning.
15. Swidden cultivation is the ultimate refuge of landless or dispossessed families in areas traditionally under swidden cultivation.
16. Swidden cultivation ecology keeps people in a village bound together in strong bonds of co-operation and this induces spontaneous social welfare of the crippled, destitute or otherwise deprived households.

The above features associated with swidden cultivation -- perhaps there are many more -- need to be systematically tested in various ethnic groups or areas.

Country-wide comparative, co-ordinated and multi-disciplinary studies are called for, rather urgently, to cover the following gaps

in our knowledge and understanding of the swidden cultivation as an ecological situation, as a national or regional problem, and as a problem perceived by the swiddeners themselves:

1. Population census of the ethnic groups dependent on swidden cultivation and forest resources, swiddener family size, and labour force.
2. Census of land under swidden cultivation: quantity, physiography,vegetation cycle, soil type, land use, swidden cycle.
3. Study of weeds, pests and natural enemies of pests and weeds.
4. Swidden land holding, swidden land tenure.
5. Survey of swidden productivity and consumption patterns of swiddeners.
6. Survey of nutrition and privation behaviour.
7. Determination of effects of burning on soil, vegetation cycle, ground water level etc. on swidden.
8. Traditional swidden technology and its relation to soil erosion, soil fertility and water retention.
9. Comparative study of traditional technology of swiddens,terraces and permanent mono-culture cultivation and its bearing on soil erosion, soil fertility, water retention etc.
10. Development of improved high-yielding seeds of the traditional crops and other useful crops adapted to swidden conditions in each ecological region or sub-region.
11. Development of optimum land-use and rotation of crops on swiddens, using the traditional crops (improved varieties) for greater production, least ecological imbalance and quicker land recuperation during fallow period.
12. Study of diseases endemic in the area of swidden cultivation and their etiology.
13. Process and extent of adoption of alternative means of livelihood by the swiddeners; viability of these alternative occupations and modes of production in comparison with swidden cultivation.
14. Optimum family size, family aspirations, concepts of prosperous family and means of achieving prosperity as perceived by swiddeners.
15. Forms and uses of co-operation in traditional swidden village community and changes due to adoption of alternative means of subsistence or modes of production.

16. Welfare needs of the village community, institutions that meet them under conditions of swidden cultivation, and how these are coped with under altered circumstances, as in settlers' colonies or under other modes of life adopted by the swiddeners.
17. Self-management or self-regulation institutions under swidden cultivation situation and the changes in them or their substitutes in the event of transformation of swidden cultivators into permanent cultivators or horticulturists.
18. Study of socio-economic impact of hitherto executed swidden control schemes and swiddener resettlement schemes.
19. Legal provisions ensuring forest rights and security in land rights and their implementation.
20. Impact of prohibition measures (for intoxicants and narcotics) on the nutritional and psychological well-being of the swiddeners.

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