1985

International Board for Soil Research and Management

IBSRAM is an international agency dedicated to assisting and speeding applications of soil science in the interest of increasing sustainable food production in developing countries.

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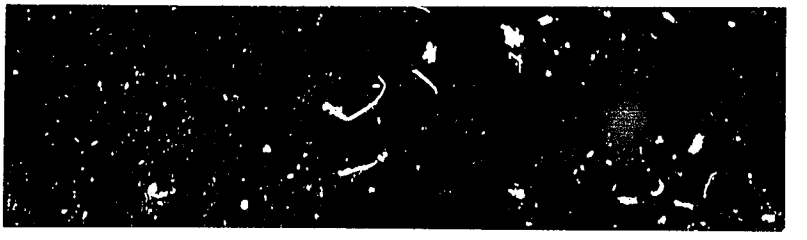
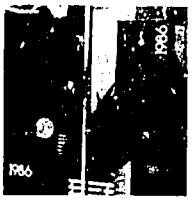




INTERNATIONAL BOARD FOR SOIL RESEARCH AND MANAGEMENT

The International Board for Soil Research and Management (IBSRAM), established in 1983, aims at bridging the gap between crop research conducted in international agricultural research centers and soil research undertaken mainly by national research organizations. It also aims at establishing a bridge between basic research and extension work by promoting adaptative soil management research programs in developing countries.

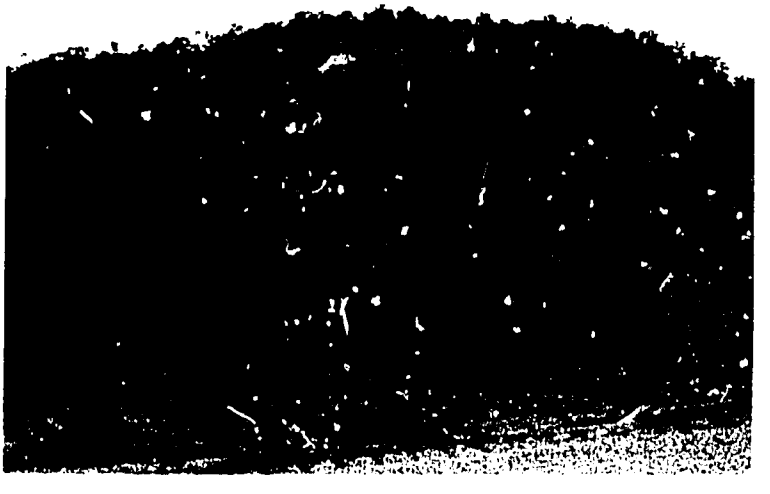
In this regard, the overall goal of IBSRAM is to promote improved and sustainable soil management technologies in order to remove or reduce soil constraints to food and other agricultural production in developing countries. The three objectives of IBSRAM are:

1. By the network approach, to validate or test existing knowledge of soil management and to promote applied soil management research by national agronomic institutions.

2. To disseminate widely information about validated technologies — through newsletters, other publications, training courses, computerized data bases, and workshops.
3. To strengthen national agronomic institutions by network and information activities and by providing technical support.

Programs on soil management, to be efficiently conducted, require a good knowledge of soils and their environment, of the farmers in the target areas and their practices, and of the latest developments in soil management research. In order to achieve these aims, IBSRAM — in association with its cooperators — has developed during the past three years a soil management approach which delineates the framework of each network, the type of experiments to be conducted, and the methodology to be employed.

FRAMEWORK OF THE NETWORKS



The first issue which arose in establishing the soil management networks was the question of defining the target areas. This was done by the IBSRAM Board of Trustees after the International Workshop on Soils held in Townsville, Australia, in 1983, and the selected areas were considered in more detail during four subsequent inaugural workshops conducted in 1985. Three main areas were viewed as priority targets for the IBSRAM soil management networks.

- the management of Vertisols
- the management of acid tropical soils
- tropical land clearing for sustainable agriculture.

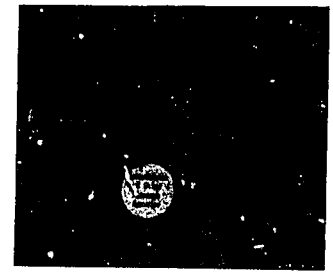
These three topics are viewed as global ones by IBSRAM, and constitute, either alone or in conjunction with each other, the subject areas of the three current regional soil management networks:

- Management of Vertisols under Semi-Arid Conditions in Africa (MOVUSAC),
- Land Development and Management of Acid Soils in Humid Africa (AFRICALAND), and
- Land Development and Soil Management in Asia and the Pacific (ASIALAND).

Another issue which was resolved during the IBSRAM workshops was that soil management research is more than soil research: it relates to soils, crops, farmers, and national policies. Therefore a multidisciplinary approach must be taken to tackle soil management problems. Soil has to be studied holistically, with emphasis on the surface layers and their variability in relation to their suitability for agricultural production. Crops have to be monitored in relation to each other as cropping systems, – or more precisely as farming systems, since farmers are involved. The prac-

tices of farmers and the constraints they face have to be known in order to test new farming systems. National policies with regard to the lands and crops to be employed have to be assessed before starting an experiment. All of this means that soil management experiments must involve specialists in various disciplines if they are to result in the development of improved practices for the cooperators.

The actual organization of the networks was the third general issue considered during the four inaugural workshops. The relations between the cooperators, IBSRAM, and the donors have been clarified. The cooperators are the people responsible for initiating and operating the national soil management research projects. IBSRAM establishes a framework for the network in conjunction with the cooperators, but the research to be conducted will be carried out by the cooperators. The investigations must be relevant both to the country's objectives and to the network aims. IBSRAM will not commission a research project to an organization but rather will ask the cooperating country itself to make a voluntary commitment to conduct the project. It is understood that some additional funds may be needed by the cooperators, and in this matter IBSRAM will lend its support to the cooperators in the development of the project plan

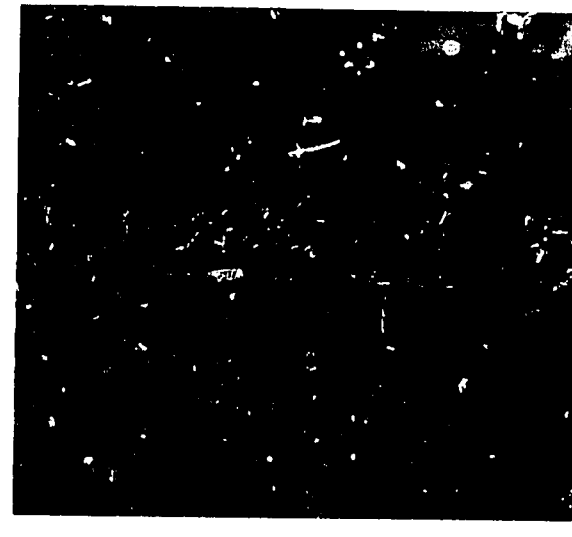


and in seeking such supplementary funding as may be required. However, external funding should, in IBSRAM's view, be at a very modest level, and should be a small fraction of the national funding so that the genuine interest of the cooperating country is assured and demonstrated.

The mechanism being developed for approval of project proposals consists of the following steps: (i) presentation by the cooperators of the project proposals to IBSRAM; (ii) a review of the proposals with the Network Coordinating Committee (NCC); and (iii) acceptance of the refined project proposals by the IBSRAM Board. When necessary, IBSRAM will help cooperators who seek some donor funding support to enable or speed execution of their projects.

The criteria of approval are the following: (i) projects need to conform to the network's objectives; (ii) projects must be technically acceptable, i.e. employ the approach and methodology agreed upon by the network at large; (iii) projects need to be scientifically and economically acceptable; and (iv) the cooperants should already be involved in research of the type proposed, or be able and willing to invest in the projects as matters of national priority for which assured national support of human, physical and financial resources are assured.

	INFORMATION Different Network ACTIVITIES	ACCEPTED NETWORK PROGRAM	BASIC RESEARCH RELATED TO THE NETWORKS
SIMPLE	×	–	/ –
ACTIVE	×	×	–
BASIC	×	– ×	×
SUPPORT	×	–	×



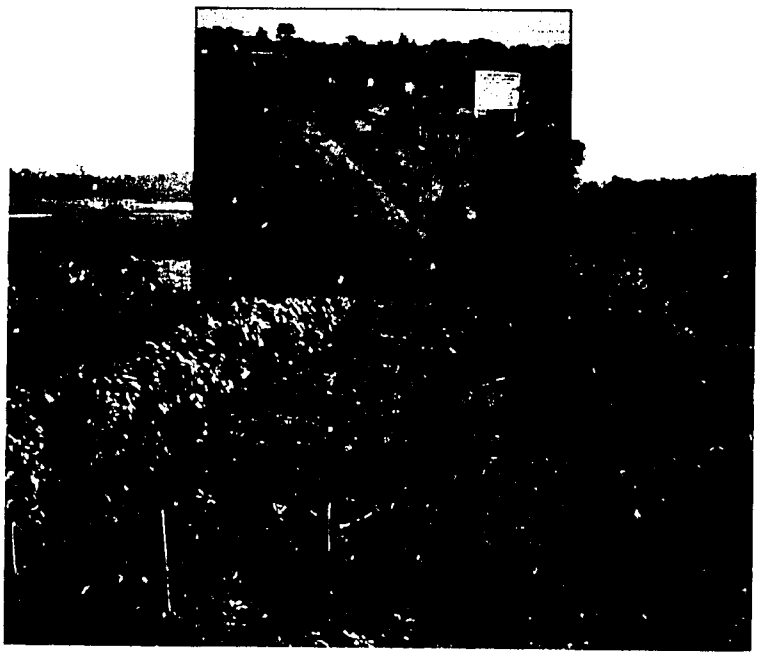
TYPE OF EXPERIMENT

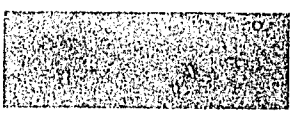
One of the main issues which arose during our recent seminar on Soil Management under Humid Conditions in Khon Kaen, Thailand, and in the subsequent seminar on Vertisols in Nairobi, Kenya, and on Land Development and Management of Acid Soils in Lusaka, Zambia, was concerned with the type of experiment IBSRAM networks should undertake. A distinction was made between two types of experiment:

1. Common-core experiments, in which most of the cooperators should participate and thereby gain reciprocal benefits, and in which known successful techniques are tested in a number of different situations.
2. Support trials, or satellite experiments, which take place within a common framework, but which will be activities of particular cooperators in order to fill gaps in present knowledge, whether nationally or regionally.

The distinction is not simply academic, but relates in a very practical sense to the IBSRAM strategy. An IBSRAM core experiment is intended to test farming systems — their performance and sustainability. It will use our present knowledge or predictions with regard to fertilizer and lime requirements, crop varieties and management, the levels of inputs acceptable by farmers, and priorities in terms of crops and the land to be developed. Participants discussing the management of acid soils experiments in Khon Kaen defined the following minimum number of situations which needed to be evaluated and compared for the common-core experiments of that network:

1. The normal practice of the local farmers, which is usually characterized by mono- or mixed-cropping followed by a fallow period. This treatment is used as a reference for the others.





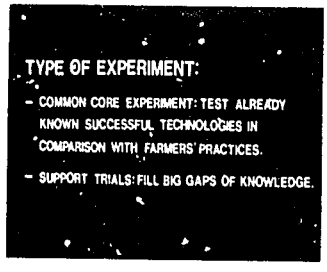
2. One or two treatments using low-input technology in which acid-tolerant species are used in intercropping, successive cropping, or other cropping systems (including a legume), and where the low inputs may consist of a small amount of fertilizer (mainly phosphorus, perhaps with some calcium and magnesium as nutrients). Agroforestry or ley-arable cropping systems may be one option.

3. A treatment using high- or recommended-input technology which might entail, in addition to high yield varieties, (i) pH correction by an appropriate liming, and (ii) use of fertilizer as determined by soil tests or field experiments. In this treatment, highly productive plant species are used, either in a crop rotation or by adopting new cropping-system techniques.

Many modifications of this framework are of course possible, and the introduction of ley-arable cropping systems, agroforestry, and more specifically alley cropping, are of course desirable innovations where cooperators already have experience with them. The rates of application for input may be determined according to current local information and recommendations, and the acid-tolerant germplasms used are those which are locally available. Later, adjustments may need to be made as new knowledge is obtained.

At this stage, no attempt is made to have a uniform experiment with the same input and cropping system for all the cooperators in a network Initially local practices and recommendations will be used. The only exception to this heterogeneity is that there should be one common crop to all cooperators – say maize or upland rice – so as to facilitate comparisons. In Lusaka a common high-input cropping system of maize-groundnut was recommended.

In fact, comparisons between farming systems is a basic need. However it is difficult to compare yields of cassava with yields of groundnuts. It has therefore been suggested that a conversion to "wheat equivalent" could be used, as proposed by the *Atlas of African Agriculture* of the FAO. However since we are comparing farming systems, it may be preferable to convert yields into cash terms – i.e. their cash value at harvest time. The value of different yields of a cropping system can be added together to determine the yearly outputs of the tested systems. As for inputs to the system, there is a need



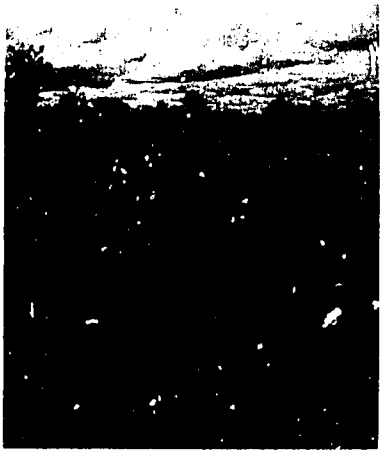
to consider direct investments (lime, fertilizer, seeds, pesticides and herbicides) and manpower, bearing in mind that the availability of manpower may vary at different times of the year and could be a critical issue for the success of a cropping system at the farmer's level. Such an evaluation will enable determination of the socioeconomic sustainability and acceptability of the tested systems.

The main problem with such a socioeconomic appraisal is that although inputs and outputs can be measured, they do not indicate the way the total system functions, and this limitation may inhibit improvement in the general operation. A knowledge of changes in soil fertility, of the residual effects of the treatments which were applied to the soil, or of the risks of soil degradation are essential in this connection. Monitoring these aspects will enable technologies to be adapted so as to achieve agroecological sustainability. It is only when the socioeconomic and agroecological sustainability of a farming system have been assessed that the system can be properly considered as being suitable for general extension and promotion to farmers.

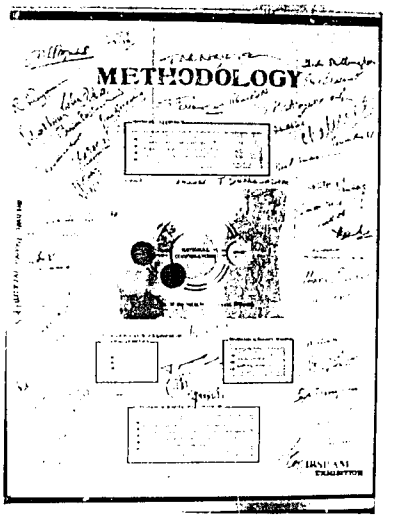
Support trials or satellite experiments are more classical types of agronomic experiments. They tend to correlate a fertility component or

a crop variety to a yield. In some cases they may be essential, as big gaps may exist in the local knowledge. Lime requirements, fertilizer needs, or adapted crop varieties are all too often far from being properly understood, and consequently the recommendations issued are not always satisfactory. Trials are necessary to adjust recommendations to suit local conditions; their results may subsequently be incorporated in the core experiment.

More basic research, such as the work to be carried out on the forms of aluminum in the soil, on erosion rates, or on the dynamics of the organic matter, are also needed. This research, which needs strong laboratory backup, may be conducted with the help of international agricultural research centers or universities in developed countries. Such cooperation will prove fruitful for both partners, and will help establish international contacts. It follows that basic research is highly desirable, as there are big gaps in our knowledge on the management of tropical soils. However, if conducted without the core experiments, investigations of this sort may involve an unaffordably long process, and may use up much of the cooperator's efforts and resources while detracting from his main aim, which is to obtain, in a reasonable length of time, viable improved technology to be transferred to the farmers.



METHODOLOGY



As three IBSRAM soil management networks have been launched, the need for a commonly accepted methodology is now a matter of urgency. Site selection and characterization, the design of experiments, and the monitoring of farming systems have been discussed in our last three regional seminars. It is now time to review and to finalize these recommendations. A first draft of a report setting out the suggested ordering of previous recommendations has been prepared and is being circulated. It will be discussed in due course before its final adoption.

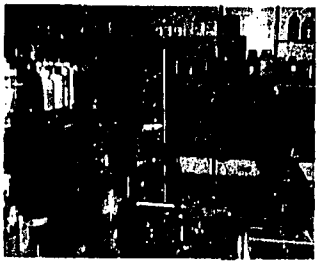
The first question, however, which might reasonably be asked is: why do we need standardized methodologies for the IBSRAM networks? Many guidebooks provide soil descriptions and soil analysis methods; some also discuss the relevant environmental issues and socioeconomic considerations. Why, then, should we not merely use methodologies with which we are already familiar?

The answer is that methodologies should be suited to the aim of the research and not the other way round. "Routine" descriptions and analyses have been performed for too long in soil science and agronomy, without regard to their significance in relation to agricultural improvements. As a consequence, too many agronomists hardly utilize these routine operations except as background information, and often the interrelations between soil and crops are not adequately considered. It also needs to be borne in mind that the acquisition of soil and environmental data is an expensive process. If the data requirements are not carefully chosen, excessive costs may overload a research budget. For a methodology to be appropriate, it must be suited to the research objectives. This means that for soil management projects emphasis must be put on characterization of the topsoil and its variability, on the environmental parameters which affect plant growth, and on the socio-

economic background which is related to agriculture. Standard analyses often have little relevance for the assessment of soil fertility. For example, effective cation exchange capacity is much more relevant in terms of agronomy than cation exchange capacity measured after extraction by ammonium acetate at pH 7.

The second type of requirements for good methodologies are simplicity, accuracy and replicatability. IBSRAM cooperators often have limited laboratory facilities, and since methodologies must be applicable by all, they should only involve the use of a few different extractants, the determination of easily appraisable visual characters, and simple questionnaires. Training, correlation, exchange of information and samples, and the use of control laboratories are the most important features of the cooperative system which need to be applied.

Finally, methodologies must be open-ended. New results may bring a better assessment of some parameters, and a shift may be needed towards new analytical methods. Allowance must be made for incorporating new elements into the system — something which is especially important to bear in mind when choosing the data-base system.



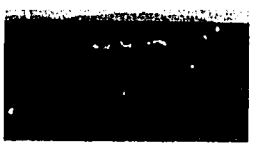
SOIL MANAGEMENT NETWORKS

MANAGEMENT OF VERTISOLS UNDER SEMI-ARID CONDITIONS (MOVUSAC)

Vertisols are dark swelling clay soils which occur extensively under semi-arid conditions in Africa, the Middle East and the Indian subcontinent. Out of an estimated total area of 300 million ha, 43 million ha* are located in semi-arid Africa and 76 million ha in India. Their total area may appear limited in Africa in comparison with other soil units (316 million ha of Ferralsols, 79 million ha of Acrisols), but their importance is much greater than the area which they cover would seem to suggest.

Various factors predispose Vertisols to high agricultural productivity – their topographical position, their depth, the nature of their clays, their nutrient contents, and – most important of all – their high water-holding capacity. However, high levels of crop yields are seldom reached due to various limitations, low infiltration rates, tillage difficulties and nutrient deficiencies. It is therefore felt that improved soil management techniques may bring a substantial increase in production on these soils.

*This figure is taken from R. Dubal: "Soil-related constraints to agricultural development in the tropics," in: *Soil-Related Constraints to Food Production in the Tropics,* IRRI, 1980. The estimate of 43 million ha proposed by Dudal does not correspond to the total area suggested by the twelve countries represented at the seminar, which would amount to 80 million ha. This indicates the need for further investigations to the determine the precise distribution of Vertisols.



The inaugural IBSRAM workshop on the Management of Vertisols for Improved Agricultural Production held at ICRISAT headquarters in Hyderabad, India, in February 1985, set out the then current views on the use of Vertisols:

1. Improved techniques are available for achieving better soil management, such as ICRISAT's broad bed-and-furrow land sloping system and improved tillage, the use of adapted varieties, and improved cropping systems.
2. Such techniques and others need to be tested and adapted in a range of semi-arid zones in order to determine the most appropriate areas for introducing them into farming practices.
3. Further research is needed, especially on water conservation, drainage, tillage, nutrient management, and cropping systems.

As a follow-up, the first regional seminar on the Management of Vertisols under Semi-Arid Conditions in Africa and Southwest Asia was held in Nairobi, Kenya, from 1 to 6 December 1986. Sixty-nine participants from 23 countries attended the seminar, including formal representatives

from 14 countries inside the region: Botswana, Burkina Faso, Egypt, Ethiopia, India, Kenya, Mali, Pakistan, Sudan, Tanzania, Tunisia, Uganda, Zambia and Zimbabwe, and one from the Arab Center for the Studies of Arid Zones and Dry Lands (ACSAD). The participants confirmed the need to establish a network on the Management of Vertisols under Semi-Arid Conditions in Africa (MOVUSAC), with the aim of developing improved sustainable soil management technologies that will substantially increase agricultural productivity.

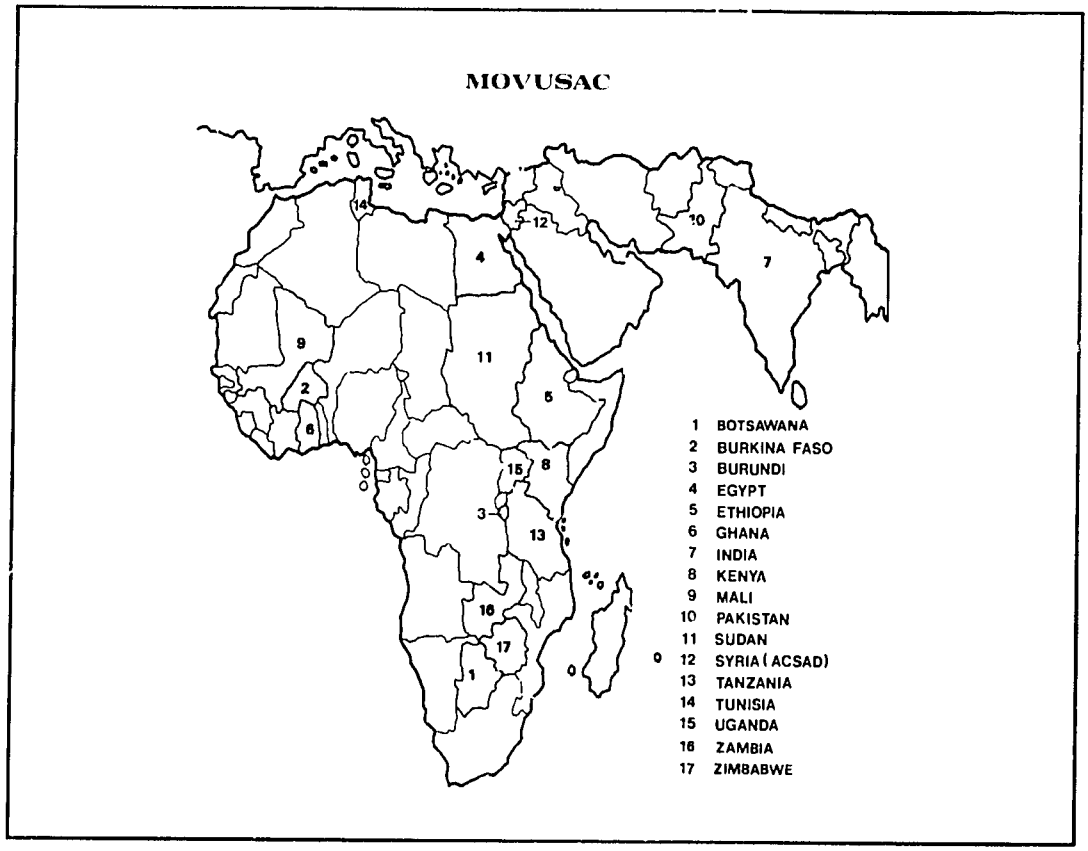
Fifteen countries or organizations have presented project proposals to be incorporated in the MOVUSAC network: Burkina Faso, Burundi, Egypt, Ethiopia, Ghana, Kenya, Mali, Pakistan, Sudan, Tanzania, Tunisia, Uganda, Zambia, Zimbabwe and ACSAD. Others, like Botswana and Malawi, may submit proposals at a later stage.

The discussion was mainly concerned with research activities and experiments. It was concluded that in addition to site characterization, which is a common activity for all the IBSRAM networks, two types of research activities will need to be conducted at each site:

1. A core management experiment, in which the aim will be to compare traditional systems with at least one, and preferably two improved systems. For this experiment, the two improved-system treatments will be designed to remove three of the major constraints pertaining to Vertisol management under semi-arid climates, i.e. water conservation, removal of temporary excess surface water, and cropping systems. The two improved-system treatments would consist of: improved traditional practices using minimum inputs of fertilizer and adapted crops, and appropriate soil mangement practices using present recommendations in terms of fertilizers and high-yield crops. For soil moisture management, improvement in soil manipulation (or tillage) is one of the most important components. ICRISAT's broad-bed-and-furrows and cropping-systems techniques are some of the most promising, and these could be common to both of the improved-system treatments – according to local conditions. The monitoring of soil moisture, erosion, fertility parameters, crop yields and inputs should allow assessments of profitability and sustainability of these improved systems in comparison with those currently used by farmers. In two or three years' time, this core management experiment should provide prototype systems which could then be tested in farmers' fields.

2. Optional satellite experiments which will mainly focus on:
   - screening of improved cultivars,
   - fertilizer trials, with macro- and micronutrients,
   - testing alternative cropping systems, and
   - tillage practices (with regard to timing and appropriate implements).

The British Overseas Development



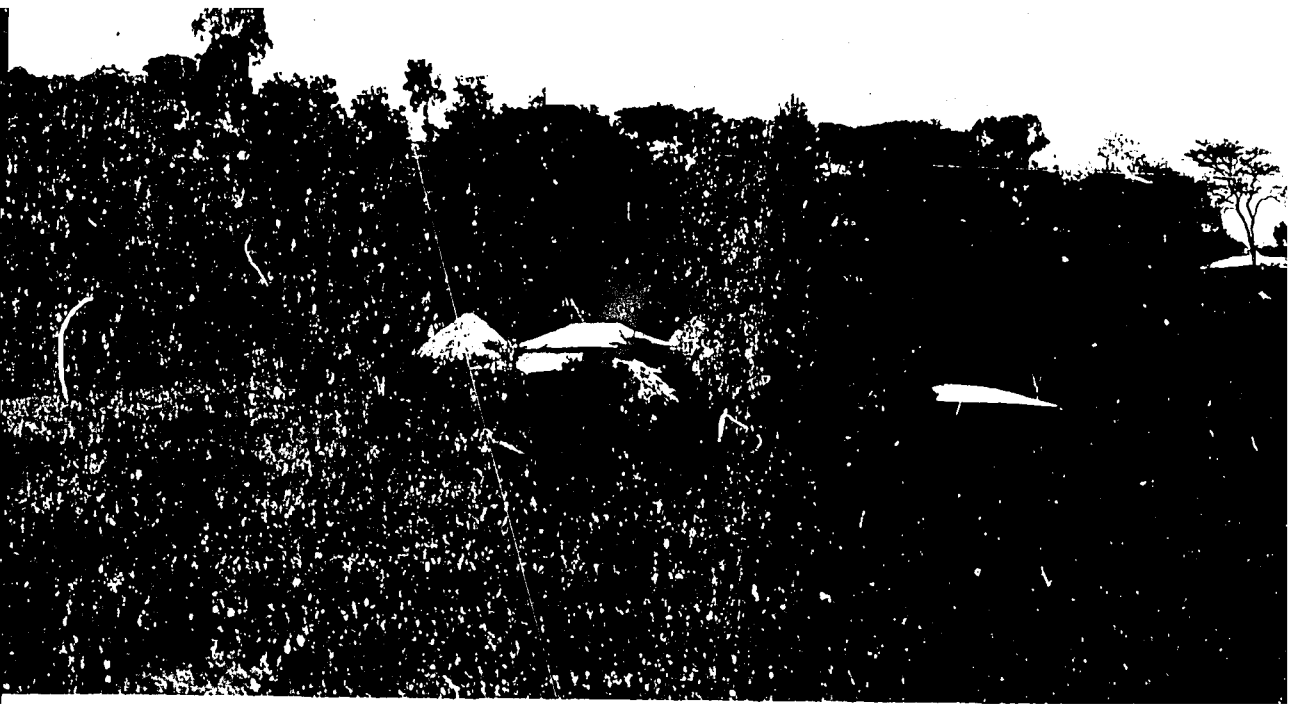
Administration (ODA) has agreed to fund the coordination of this network, and to provide some seed money for national projects in the next three years. A coordinator, Dr. Peter Ahn, who has had a long experience in Africa, has been recruited, and commences duties on 1 May 1987. The location of the MOVUSAC regional coordination office is presently being discussed, with Kenya as one of the first options. It is envisaged that the network will be fully operational by the second semester of 1987.

LAND DEVELOPMENT AND MANAGEMENT OF ACID SOILS IN AFRICA (AFRICALAND)

Acid tropical soils – Oxisols and Ultisols – of pH lower than 5.5 cover the largest block of potentially arable land in Africa. They represent around 470 million ha (about 27% of the continent) in central, southern and western Africa. They were in recent times covered with forest which is increasingly being cleared in order to open new lands for agriculture, thereby creating a worldwide environmental concern. The AFRICALAND network results from two inaugural workshops:

- Management of Acid Tropical Soils, held in Yirimaguas, Peru, and Manaus and Brasilia, Brazil from 24 April – 3 May 1985.
- Tropical Land Clearing for Sustainable Agriculture held in Jakarta and Bukittinggi, Indonesia from 27 August – 2 September 1985.

After a first regional seminar on lateritic soils, materials and ores – organized in Douala, Cameroon, 21 – 27 January 1986 – the network was informally organized, with programs being undertaken in the Ivory Coast, Congo and Zambia. This network was formalized recently during a second regional seminar held in Lusaka and Misamfu, Zambia, from 9-16 April 1987. Besides cooperators from the countries which took part in the first seminar – Burundi, Cameroon, Congo, Ivory Coast, Madagascar, Nigeria, Rwanda, Tanzania and Zambia – three new countries, namely Ghana, Kenya and Mozambique, have joined the original cooperating countries. Two subnetworks have been established, one dealing with the management of acid soils and the other with tropical land clearing for sustainable agriculture. Nine projects from Burundi, Cameroon, Congo, Ivory Coast, Ghana, Madagascar, Nigeria, Rwanda and Zambia have been submitted for incorporation into the acid soils subnetwork. Five projects from



Cameroon, Ivory Coast, Ghana and Tanzania have been prepared for incorporation into the tropical land clearing subnetwork.

As for the MOVUSAC network, a common-core experiment and satellite experiments have been agreed upon.

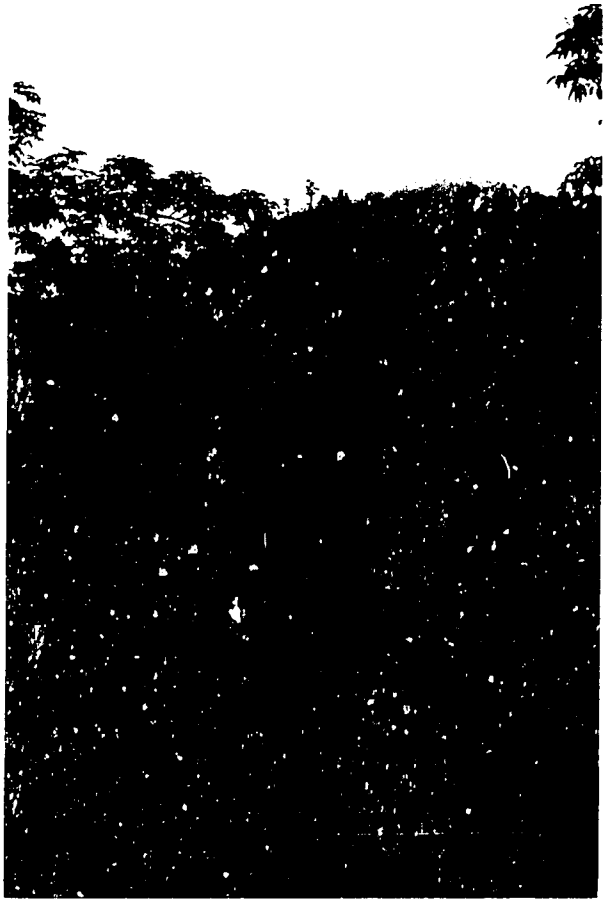
On the management of acid soils, the common-core experiment proposed aims to compare:

- farmers' practices, mainly shifting cultivation;
- improved low-input systems, with low fertilizer input and acid-resistant crops – managed fallow, cover crops and agroforestry were suggested as components of the systems;
- improved high-input systems with correction of pH and currently recommended fertilizer application with high-yield cropping systems, including maize and groundnuts.

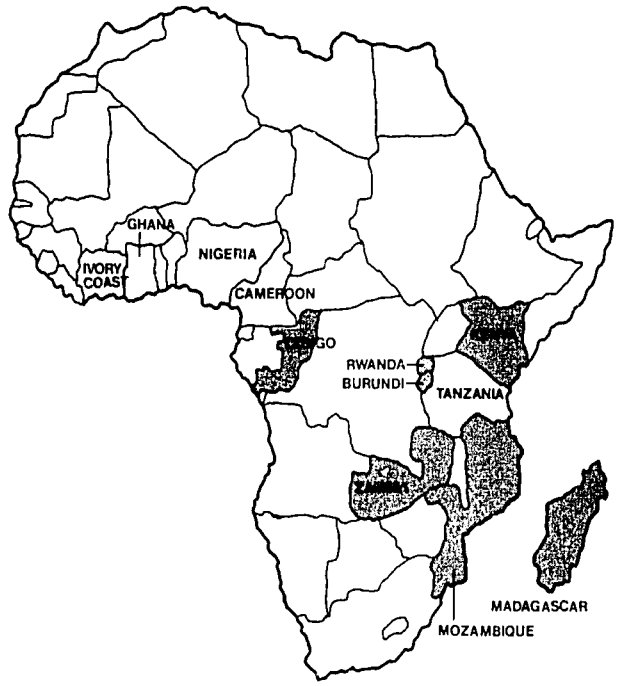
Optional satellite experiments could deal with fertilizer and lime requirements, screening of varieties, or agroforestry.

On the tropical land clearing subnetwork, it was decided to combine two aspects in the common-core experiment: (i) land-clearing methods – manual, semimechanized and fully mechanized methods; and (ii) tillage practices – ploughing, minimum tillage, and zero tillage including the use of mulching – with a common cropping system.

Fertility parameters – pH, nutrient status, compaction, permeability, moisture content and, for tropical land clearing, erosion -- will be monitored as yields in order to assess the improvement and the sustainability of the proposed systems.



AFRICALAND

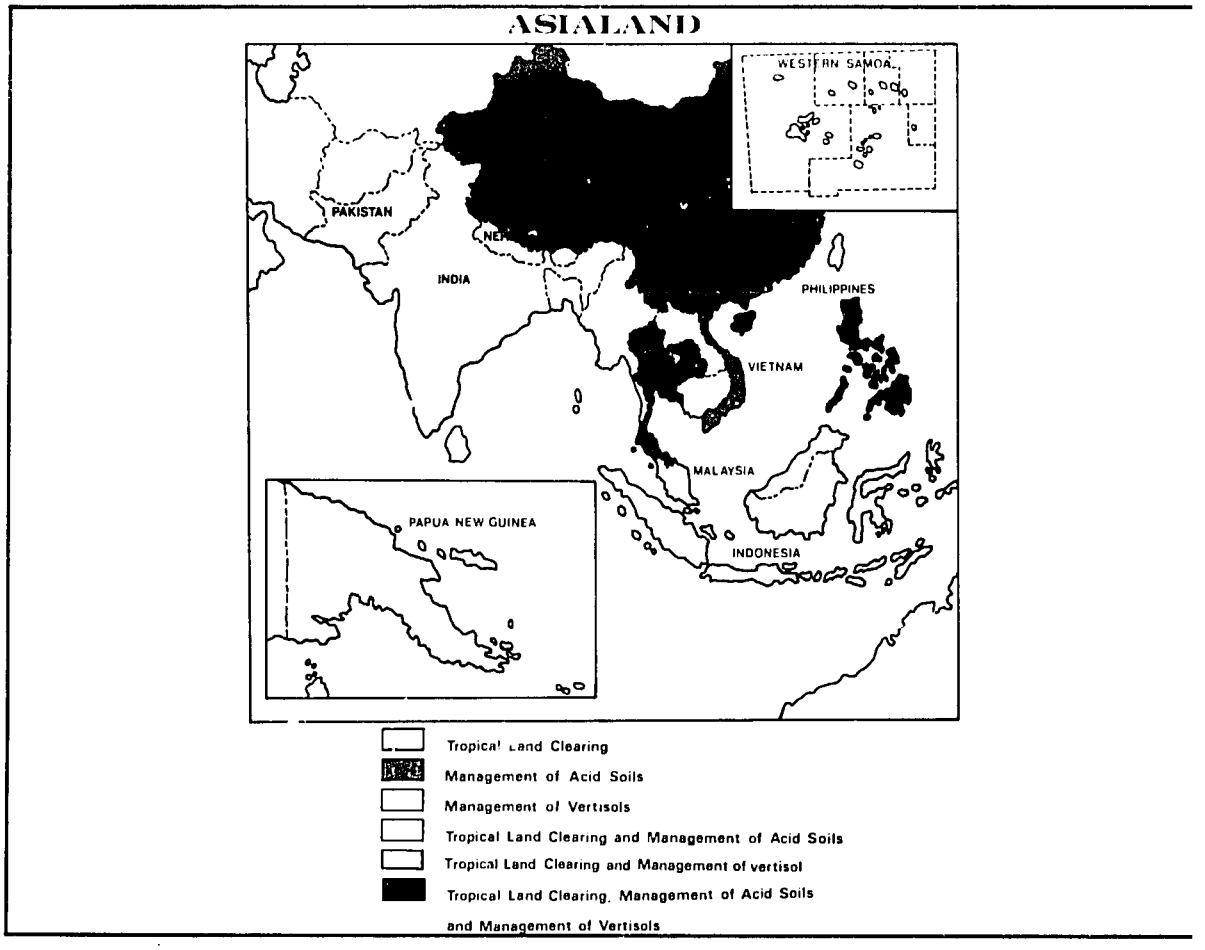


Tropical Land Clearing

Management of Acid Soils

Tropical Land Clearing and Management of Acid Soils

The Canadian International Development Agency (CIDA) has provided funds for an initial three years' coordination of the management of acid soils subnetwork, and the Federal Republic of Germany has promised support for the tropical land clearing for sustainable agriculture subnetwork, also on an initial three-year basis. Dr. A. Murshid has been appointed as coordinator of the network and commenced duties on 1 April 1987. The network is expected to be fully operative by the end of 1987.



LAND DEVELOPMENT AND SOIL MANAGEMENT IN ASIA AND THE PACIFIC (ASIALAND)

Proper soil management under humid conditions, the adaptation and use of new cost-saving technologies in order to increase food and fiber production while minimizing environmental damage, is becoming more and more urgent in Asia. Forest clearing is increasing at a very high rate – where there is still some forest – and reaches lands which are extremely marginal for crop production. Sound clearing methodologies are often not adopted, and hence land clearing creates soil problems for plant growth. Whereas clearing is sometimes a necessity due to high population pressure, on the whole management technologies used on already cleared lands remain rather poor. More intensive land use under poor management technologies has created extensive areas of degraded lands covered with alang-alang (*Imperata cylindrica*) or other grasses.

The inaugural workshops – (i) tropical land clearing for sustainable agriculture, (ii) management of acid tropical soils, and (iii) management of Vertisols – addressed these questions. They showed that some technologies are available for better soil management, that these technologies and others need to be tested and adapted in order to extend the successful ones to farmers, and that further research is essential in order to improve these technologies.

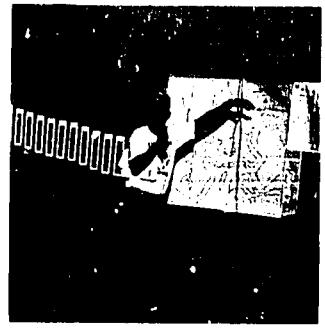
In order to promote these technologies and to conduct the further research which is necessary, a regional

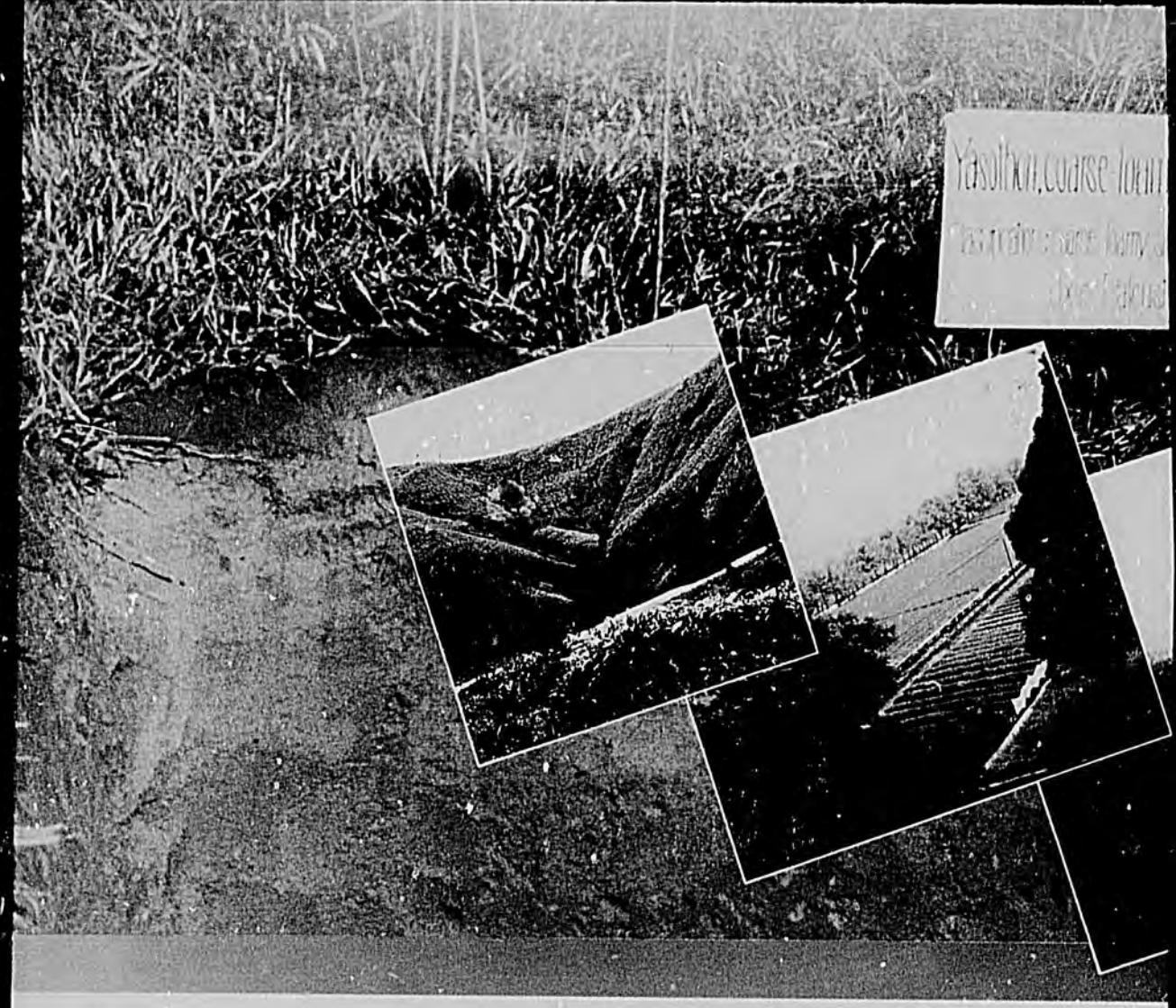
network approach was initiated. A regional seminar on Soil Management under Humid Conditions was organized in Khon Kaen, Phitsanulok, Thailand, from 13-20 October 1986, and three priority targets were looked at:

- tropical land clearing for sustainable agriculture, including land-clearing methods, post-clearing soil management, and rehabilitation of degraded lands;
- management of acid tropical soils; and
- post-rice soil and crop management on Vertisols.

Eleven countries participated: China, India, Indonesia, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Thailand, Vietnam, and Western Samoa. The seminar was supported by the Asian Development Bank (ADB) and the Australian Centre for International Agricultural Research (ACIAR). As for the MOVUSAC and the AFRICALAND networks, common-core experiments and support trials were envisaged and agreed upon during the seminar. Subsequent to the seminar, more than thirty project proposals for the three subnetworks were reviewed. The countries concerned and the number of relevant projects which were proposed by each country are as follows:

1. Tropical land clearing for sustainable agriculture: China (1), Indonesia (2), Malaysia (2), Nepal (1), Pakistan (1), Philippines (1), Thailand (2), Western Samoa (1).
2. Management of acid tropical soils: China (1), Malaysia (4), Philippines (1), Thailand (1), Vietnam (1), Western Samoa (1).
3. Post-rice soil and crop management of Vertisols: China (1), Pakistan (1), Philippines (1), Thailand (1).





A project proposal for the coordination of the network and for the support of the national projects has been submitted to the Asian Development Bank (ADB), the Australian Development Assistance Bureau (ADAB), the Government of Japan, and the European Economic Community. It is hoped that at least part of the network will be funded by the end of 1987.


nit (Yl-col)
hyperthermic

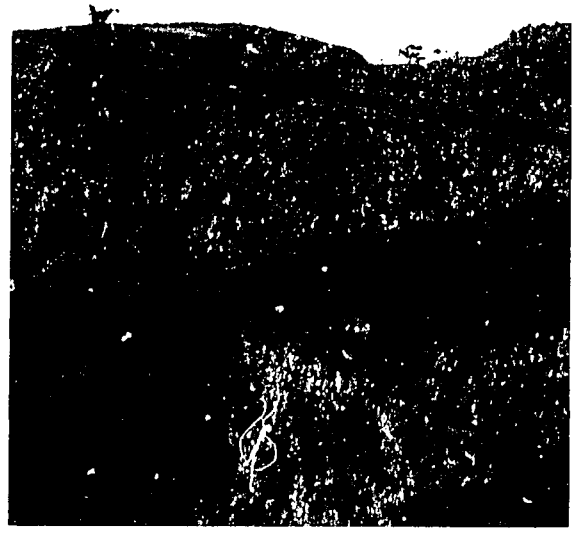

FIRST REGIONAL SEMINAR
SOIL MANAGEMENT UNDER RU
CONDITIONS IN ASIA
KHON-KAEN - PHITSANU

OTHER ACTIVITIES

The formation of the IBSRAM soil management networks has been greeted with great enthusiasm by the participants of the regional seminars and by other interested scientists and administrators. This enthusiasm is reflected by the copious mail IBSRAM has received asking for information about network operations and the procedure to join the networks. Many other subject or geographic areas have also been proposed for consideration by IBSRAM.

Concerning subject areas, the management of the very extensive sandy Alfisols in the African Sahel appears to be one of the first priorities after the three original global targets. Management of acid sulfate soils, or of steepland soils, have also been mentioned many times, as well as the means to prevent desertification or to link soil management projects with land use planning programs.

Two geographic areas will also need particular attention: Oceania and Latin America. During a workshop on the management of acid soils in Oceania held in Palau, Micronesia, participants asked to organize, even in an informal way, a network for post-clearing soil management and for the rehabilitation of degraded lands. A follow-up meeting coorganized by IBSRAM and the University of the South Pacific may take place in 1988. Besides, IBSRAM has for long had an interest in Latin America but has not yet secured funds to implement actions there. However IBSRAM has been invited to join the Xth Congresso Latino-Americano de la Ciencia del Suelo in Maracaibo, Venezuela, to examine with interested



scientists the possibility of a similar exercise on the management of acid soils. Such an effort will be coordinated with TropSoils, which has a strong research network in Latin America.

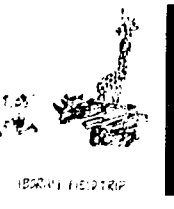
During its meeting in March 1987, the IBSRAM Board of Trustees appreciated these marks of interest. However, it felt that due to the current lack of personnel, it was advisable not to overcommit the headquarters with activities beyond those undertaken in connection with the present networks.

To be efficient, networks need scientists with adequate sources of information, trained personnel and understood data-processing procedures. Once the network becomes operational, an important factor for success is to ensure that there are no weak links in the network chain. In order to fulfill these requirements, the following support units are envisaged:

- Information unit
- Training unit
- Data-processing unit.

Information

The information unit is one of the key factors of a network. Poor libraries and information sources, which lead to duplication and inefficiency in research, are common conditions in national research organizations of the developing world. Therefore, in order to fulfill these needs, IBSRAM has planned an information unit designed to spread soil management technologies, and to disseminate scientific material and general information to cooperators, interested scientists and administrators. The Canadian International Development Research Center (IDRC) has agreed to help IBSRAM organize its information unit, and a consultancy on this subject will be arranged as soon as possible. Newsletters, reports of seminars, a review of highlights, and proceedings of workshops and seminars are presently being produced in Bangkok. A plan to produce a journal on tropical soil management containing abstracts and reviews is awaiting support.

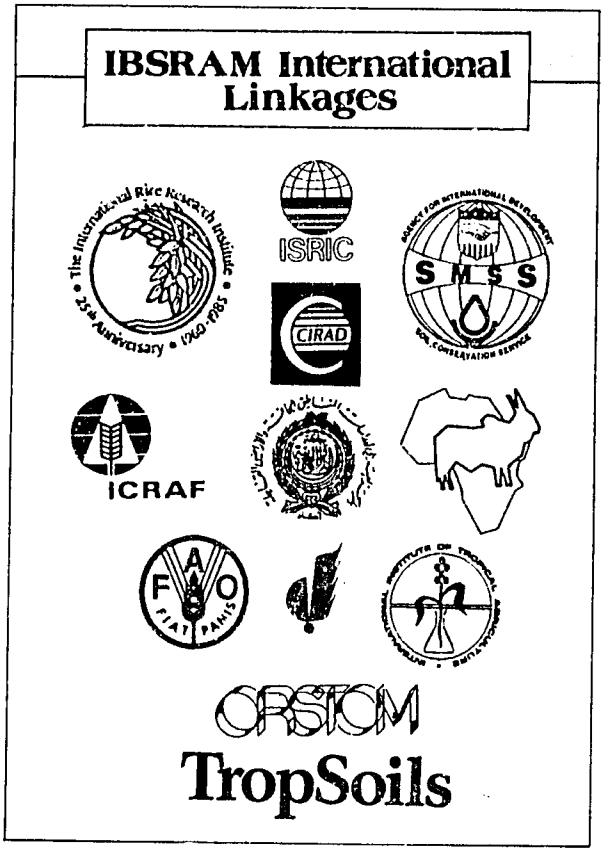


Training

The provision of training is one major part of network functions. Training determines the quality of the results produced and thus the outcome of the network. Training, in IBSRAM's view, must address itself first and foremost to the front-line researchers, to those who actually conduct the experiments. It must concentrate on short-term (3-6 weeks) courses focused on one subject relevant to the network. IBSRAM is at present seeking a consultancy on this subject. In the meantime, there are plans to help cooperators participate in training courses related to soil management experiments and laboratory practices organized by the International Institute for Tropical Agriculture (IITA), the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), TropSoils, or by any other institutions offering relevant courses. USAID has agreed to help one training course this year, and plans have been put forward for a course on the design of experiments to be conducted in Zambia. Another course may be organized next year on site characterization with the help of the U.S. Soil Management Support Services (SMSS).

Data Processing

A data bank and accepted data-processing procedures are major needs of soil management networks. They allow the full use of the information collected by the different cooperators and the processing of such information. A data-processing unit is needed as soon as possible because the data requirements must be discussed before starting the experiments, and not after they have been started and are difficult to change. Unfortunately it has not been possible to develop this unit during the period under review.



International linkages have increased markedly during the year under review. Cooperation with international centers and other research agencies has been established on the basis that IBSRAM, as a coordinating agency whose function it is to promote adaptive research, will help to disseminate successful technologies obtained by these centers. Such links are presently established in a formal way with TropSoils for the network on the management of acid tropical soils – a network in which Dr. P. Sanchez is playing a leading role. On an informal but active basis, cooperative links also exist between IBSRAM and the Arab Center for Studies of Arid Zones and Dry Lands (ACSAD), the Food and Agriculture Organization of the United Nations (FAO), the International Council for Agroforestry (ICRAF), the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), the International Institute for Tropical Agriculture (IITA), the International Livestock Center for Africa (ILCA), the International Rice Research Institute (IRRI), and the International Soil Reference and Information Center (ISRIC). Special mention should be made of the cooperation received from IITA (Dr. Lal and Dr. Terry) and ICRISAT (Dr. Virmani and Dr. Burford), who have helped to promote our land-clearing and Vertisols networks. Training courses are also scheduled in cooperation with these institutes.

Cooperation with research agencies and the universities of developed countries has also increased. Scientists from the Institut Français de Recherche pour le Développement en Coopération (ORSTOM) have contributed to our seminars in Douala, Khon Kaen, Nairobi and Lusaka, and ORSTOM has also helped in backstopping some of our African cooperators. CIRAD, the Centre de Coopération International en Recherche Agronomique pour le Développement will also help some of our African cooperators. The U.S. Soil Management Support Service (SMSS), through its program leader Dr. H. Eswaran, has also been very helpful in promoting some of our activities, and there are now plans for the SMSS and IBSRAM to organize a training course on site characterization.

ORGANIZATION AND OPERATIONS

IBSRAM functions through its Board of Trustees and Support Group, its staff, its headquarters, and its regional coordination offices.

The Board of Trustees and Support Group

The Board of Trustees is the executive and policymaking body which has primary responsibility for IBSRAM. It is composed of ten members plus the director as an *ex-officio* member.

The IBSRAM Support Group which is to be established in the near future will replace the IBSRAM donors' interest group and will be the official link between IBSRAM, its Board of Trustees, and donors. It will meet once a year and provide an opportunity for communication and consultation concerning IBSRAM's research program, financial requirements and other matters of concern.

The Staff

Five senior staff – the director, an administrative officer, two coordinators and an editor – and five support staff form the total IBSRAM workforce. Even with the recent addition of the two network coordinators, the staff is far from adequate in relation to current operations. This shortage has restricted the management of IBSRAM operations during the period under review. The most urgent staffing needs at present are for a coordinator for the ASIALAND network, a project officer to assist the director, and an administrative assistant.

The Headquarters

In inviting IBSRAM to Thailand, the Department of Land Development (DLD) agreed to help it obtain international status in the country and to provide it with office space. It also offered land in its compound on which to build its permanent headquarters.

Agreement in Thailand

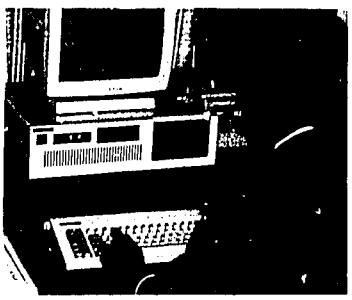
Soon after the choice of Bangkok for the IBSRAM headquarters, the Thai Cabinet recognized IBSRAM as an international organization. On 26 November 1985, a memorandum of understanding was signed between the DLD and IBSRAM, granting IBSRAM privileges for conducting its activities – such as facilities to obtain temporary stay permits for nonresident personnel, tax reimbursement for office equipment, and reimbursement of customs and income taxes for personnel not permanently resident in the country. Discussions are presently under way with the Thai government in order to obtain the full rights and privileges of a nonprofit international organization.

Headquarters temporary office

The present headquarters office is located in the main building of the DLD at Bangkhen, Bangkok. It covers 196 m^2 with six offices, one meeting room and a large reception area. The office, which was spacious enough last year, has now become crowded, and it will soon be necessary to find new office and storage space. Plans for the future permanent office will be prepared for next year.

Regional Coordination Offices

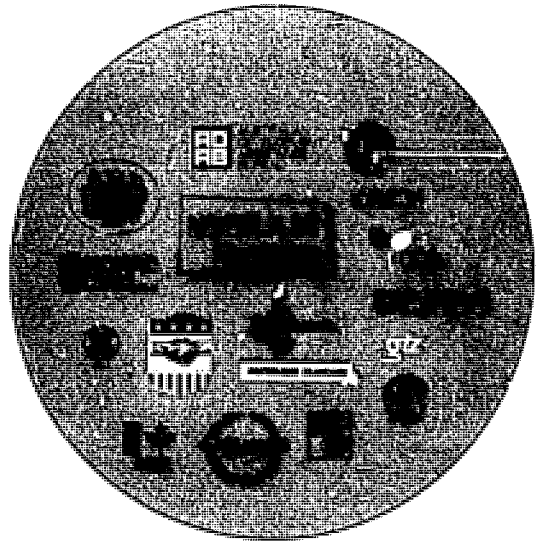
Two regional coordination offices have to be found in Africa for the two IBSRAM regional networks, namely MOVUSAC and AFRICALAND. The existence of active ongoing national programs of the network, facilities for communications, and possible linkages with other international programs or institutes are the main criteria of choice for these offices. Given the present geographical activities of the networks, the MOVUSAC coordination office will probably be located in the eastern or southern part of Africa and the AFRICALAND coordination office in the western part of Africa. The ASIALAND coordination office will probably be located in Bangkok.



Financial support for IBSRAM has increased considerably this year. Fourteen countries or agencies at present support its activities: the Australian Centre for International Agricultural Research (ACIAR), the Australian Development Assistance Bureau (ADAB), the Asian Development Bank (ADB), the Bundesministerium für Wirtshafliche Zusammenarbeit (BMZ) of the Federal Republic of Germany, the Canadian International Development Agency (CIDA), the Technical Centre for Agriculture and Rural Development of the EEC (CTA), the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), the French Ministry of Foreign Affairs, the Institut Français de Recherche pour le Développement en Coopération (ORSTOM), the Norwegian Agency for International Development (NORAD), the British Overseas Development Administration (ODA), the Swedish Agency for Research Cooperation with Developing Countries (SAREC), the Department of Land Development (Thailand), the U.S. Soil Management Support Services (SMSS), and the U.S. Agency for International Development (USAID). It is also appropriate to mention the considerable support we have received from the host countries where our seminars and workshops have been held.

The total funds expected in 1987 exceed US$2.3 million, as compared to US$.85 million in 1986 and US$.47 million in 1985. This is a clear sign of the increasing support IBSRAM is receiving from donors. The funding for the coordination of our two African networks — MOVUSAC by ODA, and AFRICALAND by both CIDA (the acid soil subnetwork) and the Federal Republic of Germany (the land clearing subnetwork) — has been secured for an initial period of three years. However, we are still seeking funds for the coordination of our ASIALAND network and, on a bilateral basis, for the national project proposals.

One difficulty which arises in connection with funding is the imbalance which exists between our core resources and our project resources. In particular, we need to secure financing for our support units — information, training and data processing — and the development of these units is now a matter which requires special attention.



FINANCES

Summary of IBSRAM financial support 1985/1986/estimated 1987

Source	1985	1986 Core	1986 Special projects*	1986 Total	1987 estimated Core	1987 estimated Special projects*	1987 estimated Total
1. Contribution in cash							
Accumulated surplus**	4,327	137,197		137,197	283,837	118,000	401,837
ACIAR	28,902		21,095 (3)	21,095		21,000 (3)	21,000
ADAB	115,331	–		–	54,400		54,400
ADB	–		35,000 (3)	35,000		5,000 (3)	5,000
CIDA	–	111,837		111,837	150,000	527,404 (4)	677,404
CITA/EEC	–					8,000 (3)	8,000
GTZ/BMZ	25,000		35,000 (4)	35,000		167,373 (4)	167,373
France	39,250		82,000 (4)	82,000		116,529 (4)	116,529
NORAD	–					40,000 (4)	40,000
ODA	–		240,000 (5)	240,000		496,820 (5)	496,820
SAREC	–					8,000 (3)	8,000
SMSS	45,000						–
USAID	50,000	50,000		50,000	50,000	100,000 (4)	150,000
Interest	2,568	2,106		2,106			
Subtotal . . . US$	310,378	301,140	413,095	714,235	538,237	1,608,126	2,146,362
2. Other contributions							
ACIAR (1)	10,000	5,000		5,000	5,000		5,000
Brazil (2)	10,000	–					
Cameroon (2)	–		10,000	10,000			
Indonesia (2)	10,000						
ORSTOM (1)	100,000	100,000		100,000	100,000		100,000
Peru (2)	7,200						
Thailand (1)	20,000	20,000	–	20,000	25,000		25,000
Zambia through CIDA (2)	–					30,000	30,000
Subtotal . . . US$	157,200	125,000	10,000	135,000	130,000	30,000	160,000
Grand Total . . . US$	467,578	426,140	423,095	849,235	668,237	1,638,000	2,306,362

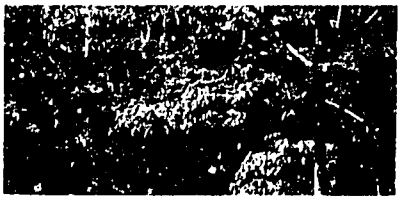
*An administrative cost of 15% will be taken on special projects (1) contribution in kind to core budget; (2) national participation in workshops; (3) ASIALAND; (4) AFRICALAND; (5) MOVUSAC.

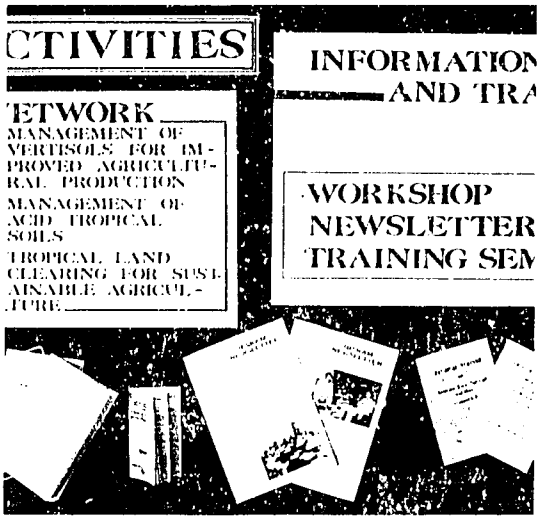
**Surplus due to differences in fiscal years between donors and IBSRAM.

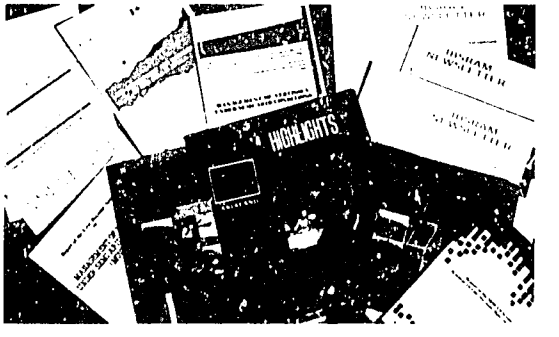
PUBLICATIONS

IBSRAM PUBLICATIONS
(1986-1987)

- Newsletter No. 3, June 1986
- Newsletter No. 4, December 1986
- Newsletter No. 5, April 1987
- Land Development and Management of Acid Tropical Soils in Africa – Report of the IBSRAM Sessions, Seminar on Lateritic Soils Materials and Ores, Douala, Cameroon, 21-27 January 1986. 32 p.
- ASIALAND: Report of the First Regional Seminar on Soil Management under Humid Conditions in Asia, Khon Kaen, Thailand, 13-20 October 1986. 40 p.
- Management of Vertisols under Semi-Arid Conditions (MOVUSAC) – Report of the First Regional Seminar, Nairobi, Kenya, 1-6 December 1986. 32 p.
- Land Development and Management of Acid Soils in Africa – Proceedings of the IBSRAM Sessions of the First Regional Seminar on Lateritic Soils, Materials and Ores, IBSRAM, 1987. 184 p.
- Soil Management under Humid Conditions in Asia and the Pacific – ASIALAND. Proceedings of the First Regional Seminar on Soil Management under Humid Conditions in Asia and the Pacific, IBSRAM, 1987. 466 p.
- Management of Acid Tropical Soil for Sustainable Agriculture – Proceedings of the IBSRAM Inaugural Workshop, 24 April – 3 May 1985, Yurimaguas, Peru and Brasilia, Brazil, IBSRAM, 1987. 300 p.







ABBREVIATIONS AND ACRONYMS

ACIAR	Australian Centre for International Agricultural Research
ACSAD	Arab Center for Studies of Arid Zones and Dry Lands
ADAB	Australian Development Assistance Bureau
ADB	Asian Development Bank
AFRICALAND	Land Development and Management of Acid Soils in Africa
ASIALAND	Land Development and Soil Management in Asia and the Pacific
BMZ	Bundesministerium für Wirtschafliche Zusammenarbeit (Federal Republic of Germany)
CIDA	Canadian International Development Agency
CIRAD	Centre de Coopération International en Recherche Agronomique pour le Développement
CTA	Technical Centre for Agriculture and Rural Development of the EEC
DLD	Department of Land Development
EEC	European Economic Community
FAO	Food and Agriculture Organization of the United Nations
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
IBSRAM	International Board for Soil Research and Management
ICRAF	International Council for Research in Agroforestry
ICRISAT	International Crop Research Institute for the Semi-Arid Tropics
IDRC	International Development Research Centre
IITA	International Institute for Tropical Agriculture
ILCA	International Livestock Centre for Africa
IRRI	International Rice Research Institute
ISRIC	International Soil Reference and Information Center
MOVUSAC	Management of Vertisols under Semi-Arid Conditions
NCC	Network Coordinating Committee
NORAD	Norwegian Agency for International Development
ODA	Overseas Development Administration
ORSTOM	Institut Français de Recherche Scientifique pour le Développement en Coopération
SAREC	Swedish Agency for Research Cooperation with Developing Countries
SMSS	Soil Management Support Services
USAID	United States Agency for International Development

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