INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS
(ICRISAT)

LAND AND SOIL ENVIRONMENT PROGRAM AT ICRISAT

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NOTE PREPARED FOR THE SOIL POLICY COMMITTEE MEETING ORGANISED BY FAO/UNEP AT ROME FROM 23-28 FEBRUARY 1981.

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Last year I reported to this Group recent achievements in the land and soil environment program of research at ICRISAT. One year is too short a period in which to review further progress in this field. However, I do not believe in rhetoric, nor in giving you platitudes, there are nevertheless some significant developments in the ICRISAT program that I consider worthy of report.

ICRISAT believes that the problem of environmental degradation cannot be tackled unless the problem of hunger is solved. Thus no soil conservation measures can be successful unless they substantially increase production per unit area per unit time. The problem of land, soil, and water resource management is interrelated with the problem of increasing food production, and it is impossible to separate the two.

Note prepared for the Soil Policy Meeting organised by FAO/UNEP at Rome from 23-28 February, 1981.

During 1980, staff of the Farming Systems Research Program, the work of which is relevant to environmental studies on land and soil, reviewed the past 7 years' researches critically. A status report entitled "Farming Systems Components for Selected Areas in India : Evidence from ICRISAT" has subsequently been prepared. Copies of this report are now available, and members may be interested in the information it contains. I do not intend to summarize the document. But suffice it to say that, for deep Vertisols, the broadbed and furrow system is ideal for reducing erosion, conserving moisture, increasing production, and changing from single-to double-cropping. The main advantages of the system are that it :

. reduces soil erosion;

. provides surface drainage;

. concentrates organic matter and fertilizer in the plant zone;

. reduces soil compaction in the plant zone;

. is suitable for supplemental water application;

. can be laid out on a permanent basis;

. facilitates land preparation during the dry season;

. reduces the power and time requirements of agricultural operations;

. makes possible precise placement of seeds/fertilizers and facilitates intercultivation work; and

. increases yield and profitability.

As a sequal to this critical study, we have gone a step further and drawn up an action program, to be located on a large watershed on deep Vertisols in Medak District, about 25 km from ICRISAT. The land belongs to farmers of the village Taddanpalle. They are all small farmers who use traditional dry farming methods. We are planning to test, evaluate, and introduce with their collaboration the technology based on the broadbed and furrow system, that of the ICRISAT site, with the advantages listed above, made possible the production of 4-5 times more per unit area per unit time. The farmers are interested in testing the system. If they find it suitable, it is proposed that all of them in the village will adopt it. The Department of Agriculture has agreed to participate in the program and to extend the use of the system to 100,000 hectares in Medak District alone. If the experiment succeeds it has the potential to change soil and water conservation practices over a few million hectares of deep Vertisols in Andhra Pradesh, and to be extended to other states as well.

Additional participative studies on farmers fields on Alfisols in Aurupalle village, Mahbubnagar district, and at Akola in Maharashtra have been very successful and farmers there are convinced of the efficiency of the system in reducing erosion and increasing production significantly.

The Farming Systems Research Program however, found that recommended techniques in using the broadbed and furrow system on deep Vertisols were not suitable for Alfisols and medium or shallow Vertisols, and have refined the technology for these soils accordingly. The Program is also reviewing its concepts and strategies for a dynamic and relevant research program for the next 10 years. It is expected this review will result in changing our strategies in the future.

To meet research needs in Africa, particularly in the Sahelian and Sudanian zones of the semi-arid tropics, ICRISAT has agreed to establish a regional center at Niamey (Niger) that will develop technology suited to the environments of the sandy soils (Entisols) of West Africa. Thus soil and water conservation techniques specific to the land, soil and climatic environments of this region of Africa will be worked out. The transferability of the techniques will be tested, on-farm, in the West African countries. In this work ICRISAT's efforts will be directed to the development of techniques that can reduce erosion, improve the environment for crop growth, and increase the level of rainfed farming production significantly.

During the last year also, ICRISAT has attempted to extend its knowledge about environment management to national programs.

A symposium on "Rainwater Management" was held jointly with the Indian National Academy of Sciences. This highlighted the land and soil management techniques required to prevent the degradation of environments and to improve production.

In a recent address to soil conservation trainees at the Central Soil and Water Conservation Research and Training Institute, Dehra Dun, I emphasised the need for a change in their outlook and philosophy: to ensure that programs of soil and water conservation are relevant to farmers' situations, and to give them a technology which they can adopt with enthusiasm.

We have developed a cooperative program with the All India Dryland program for measuring changes in soil erosion and water conservation and increasing yields. Field work for the program is undertaken at five centers on Vertisols, five centers on Alfisols and three centers on Alluvial soils. The results are reviewed and critically examined every year. In this way we hope to build up a series of data for practical application.

It may not be out of place to mention that the Government of India also has became much concerned with the environmental problems of the deterioration of land, the silting of reservoirs, and flooding. It has created a separate Department of Environmental Coordination and Policies responsible directly to the Prime Minister. When she

launched the World Conservation Strategy on 6 March 1980, the Prime Minister of India in her address highlited the need to protect the environment. She deplored the loss of large forest areas over the last 30 years, and observed that deforestation had resulted in soil erosion and floods, as well as in the silting of reservoirs and river beds. She stressed the need for soil conservation. There are many welcome indications that the Indian Government is becoming increasingly aware of the need to pay great attention to land development. Thus better management of command areas, watershed areas, drought-prone areas, desert areas, etc., have been adopted in recent years, with an emphasis in each case on proper land management. Food for Work programs are also being increasingly oriented towards soil and water conservation and afforestation. Similarly, there is an increasing realization that traditional methods of flood control, through civil engineering, are wasteful and ineffective, and that the problem of floods must be tackled at their source through proper watershed management.

On a different - but related - subject, I would like to inform you about progress and preparations for the 12th International Congress of Soil Science, to be held in New Delhi from 8 to 16 February 1982.

You may be interested to know that the Congress theme is to be "Managing Soil Resources to Meet the Challenge to Mankind". It

has been recognised that, without the proper management of soil and water resources, the world is threatened with dire consequences.

The 12th Congress is planned to comprise five Plenaries and five Symposia on subjects of relevance to the main theme. The topics of the Plenaries are :

. Soil resources of the world;

. Soils of arid zones;

. Soils of semi-arid zones;

Soils of the rice-growing humid tropics;

Soil policies (UNEP-supported program).

It may be observed that world soil policies form an important topic for discussion. I have been encouraged by UNEP and assured of their support, in this program.

The five Symposia are relevant to :

Vertisols;

Submerged rice soils;

Organic manuring in the tropics and subtropics;

Nonsymbiotic nitrogen fixation;

Desertification (UNEP-supported program)

All these topics are relevant to the today's discussion. The subject of desertification has been specifically included on the recom-

mendation of UNEP. We hope that UNEP/FAO will encourage many scientists from the developing and developed world to participate in the Congress, and benefit from its wide-ranging deliberations.

Please do not misunderstand me. This is not an attempt to publicise the 17th Congress; but I assume that this Group will be interested in information about it and I would welcome your advice and suggestions concerning this Congress program.

JSK:ss
February 2, 1981