INTERNATIONAL ATOMIC ENERGY AGENCY
UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION
INTERNATIONAL CENTRE FOR THEORETICAL PHYSICS
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SMR/402- 11

COLLEGE ON SOIL PHYSICS
9 - 27 October 1989

"Project & Produce"

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Please note: These are preliminary notes intended for internal distribution only.

PROTECT AND PRODUCE

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THE PROBLEM

Soil conservation programmes around the world have not been as successful as hoped. One of the recent theories is that project teams had not really identified the basic problems, so that projects were treating effects of soil erosion rather than causes.

It now becomes clearer that senior scientists and politicians saw farmers as part of the problem of soil erosion (not following their "scientific advice") instead of part of the solution, by continuing to use and further develop traditional measures of soil and crop management, for stable long-term sustained production with minimal inputs of (imported) machines, fertilizers and pesticides.

The scientific advice fell short in various ways:

- engineering solutions may look good because they are mathematically inspiring and aesthetically pleasing. These solutions rarely meet economic and often not even practical reality of specific sites or social arrangements; at the same time, engineering solutions have to be more or less continuous in spatial arrangements as well as in time to be most effective. But many of these solutions do not give any immediate cash or productivity return to the farmer, especially if introduced as isolated measures.

- solutions and economic calculations developed on research stations are often only 20 to 40 percent transferrable in both economic and practical terms to small farms.

TRADITIONAL SOIL CONSERVATION MEASURES

Most traditional systems which still survive, were developed by farmers over centuries and did little if any harm to the environment. It is the artificially generated demand from central governments for vastly-increased production which introduced the factor of instability.

This is partly because moisture, fertility, organic matter and soil biota management were not considered an important part of the increased production package proposed by scientists. We now see that these factors are perhaps the most important part of the practical solution, coupled with economic studies.

Minimum tillage and trash farming techniques are seen to encourage earthworms and other soil fauna to resume soil structure improvement and to recycle organic matter and nutrients as in the natural state. Conventional ploughing destroys worms.

Plants cover the soil and protect it better than any mechanical engineering solution, at a fraction of the cost.

National Policy Considerations

Government policies on the pricing of crop produce and livestock as well as marketing, with government preference for supporting the secondary rather than primary industries, coupled with real national development policies, all affect the degree to which farmers use land and participate in the wider national economy.

Subsidies can be a 2-edged sword; it is difficult for a farmer to continue to operate on the same level after the subsidies and incentives have been withdrawn, so one must be extremely cautious to introduce subsidies in the first instance.

In practice, soil conservation and environmental issues do not win votes in developing countries, or even at the manufacturing level in developed countries for that matter.

Thus, with a soil conservation strategy and supporting legislation at national level, if the political will to translate the strategy into concrete and practical action is lacking, the issues are only paid "lip service".

Short-term national development objecties may thus conflict with longer-term environmental protection and maintenance of a natural resources base. So without developing the right policy environment, research and development of new technologies for small farmers will amount to nothing, or worse, move in a negative sense if traditional and environmental balances are upset.

Farmers must be convinced about and take their own decisions on the ultimate land uses. This must be supported by appropriate national policies, and not in the reverse where policies dictate what farmers should do, as so often happens.

CALENDAR OF RECENT SOCIO-ECONOMIC SUCCESSES IN SOIL CONSERVATION

Early 1960s Technological package developed on a dam catchment in state of Victoria, Australia; proved so successful with poor farmers that the increase in tax revenue from vastly improved production of livestock actually paid back the cost of government subsidies with a profit, used to fund other subsidies.

Late 1960s Rwanda: Introduction of livestock stall-feeding integrated into a total farm development and recycling package and parallel village self-help scheme. Total farm production vastly improved from diversified enterprises and effects of intercropping and mulching.

Early 1970s Malawi: Land Husbandry concept for district or even territorial management introduced and developed, with emphasis on smallholder farmer problems. Land Husbandry Training Centre established in Zomba to teach the principles to technicians, other government services with connections in rural development and eventually training in specialized courses for all sectors of the community, from politicians and deicison-makers, to school-teachers.

Early 1980s Closing of badly eroded areas in central and northern Ethiopia meets with approval of villagers when spectacular growth of natural vegetation and planted shrubs and trees observed; source of fodder and firewood used on a regulated basis, leading to village requests for more closures to livestock or indiscriminate use.

Mid 1980s Gikongoro Province of Rwanda: development of a differential approach to rural extension programmes, which recognized the need to link land improvement and rehabilitation to the different actual and capability levels of farmers. Encouragement and subsidies given on achievement of 4 distinct steps: simple conservation measures adoption, livestock integration step, improved cultivation practices step and improved farm management step. Carefully designed programme allowed widening circle of trained step-4 farmers to train lower-level participants.

Late 1980s Development of a national soil conservation strategy for Lesotho based on the new concepts; a rough strategy was drawn from the national Agricultural Strategy and then modified by working up from village to district level, taking account of the real problems and desires encountered by individual farmers and groups, upward through the lowest levels of local administration, with concurrent formulation of a pilot working development plan.

FAO: TECHNICAL AGENCY AND DEVELOPMENT AGENCY

FAO has development and technical assistance projects in most developing countries of the world; among those projects, there are a number of soil conservation or integrated rural development projects with a strong element of soil and water conservation. To assist with the technical support to these projects, the Soil Conservation Group have commissioned or publicized a number of studies of key problems.

Successes and Failures of Soil Conservation projects

Professor N. Hudson was commissioned to identify and analyse a wide assortment of projects over the past 20 years, with a major soil conservation component. This resulted in identification of a large number of things which could and often did go wrong and a check-list of things to avoid when a new project is being designed.

Erosion losses linked to falling productivity

Dr. M. Stocking was commissioned to document cases of soil productivity declines on eroding lands. He then designed trial layouts for measuring losses with simulated densities of vegetative cover. One step further was taken in extrapolating fertility losses from soils to the national scale in Zimbabwe, based on old records, with cost estimations of the replacement of lost fertility by mineral fertilizers. It was shown that Zimbabwe loses millions of US dollars in plant nutrients annually, due to erosion. Trials have been laid out in several other countries on 3 continents and Dr. Stocking has now organized a productivity-loss network.

River sedimentation

Dr. C. Abernethy compiled records of sedimentation from major river systems, which enabled soil conservationists to follow erosion trends and to better understand such problems of water supply dams which fill with sediments much earlier than predicted by the design engineers. Another conclusion was that degradation is irregular, once "instability" sets in; a 100 percent population increase is very often accompanied by a 150 percent sediment rate increase. So-called "treated areas" as far as soil conservationists were concerned, often released more silt than untreated areas, due to mechanisms which are only beginning to be understood.

Raindrop splash from tall vegetation

Ms. M. Styczen PhD has concentrated attention on tall vegetation which can accumulate raindrops and transmit larger droplet sizes at high velocities. This results in accelerated erosion if the undergrowth or ground-level vegetation has been degraded or removed by grazing animals or inter-row cultivation. Thus, forestry without ground vegetative cover can cause more erosion (up to 200 percent) than occurs on non-forested bare ground. This study has drawn out other observations and similar conclusions from other scientists and so-called "agroforestry" trials are being re-examined in the light of these findings.

FURTHER READING

Land Husbandry, A framework for soil and water conservation - Shaxson, Hudson, Sanders, Roose and Moldenhauer. Pub: 1989, Soil and Water Conservation Society, ISBN 0-935734-201, US $ 12.00.

Conservation Farming on Steep Lands. Moldenhauer and Hudson, Editors (material from Puerto Rico Workshop, March 1987). Pub: 1988, Soil and Water Conservation Society, ISBN 0-935734-19-8, US$ 25.00.

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* Opinions stated in this paper are the author's views and are not necessarily endorsed by FAO.