

OPERATIONALISING SOIL CONSERVATION POLICIES AND PROJECTS – THE CHALLENGING PROBLEMS AHEAD

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Abstract

There is a general opinion that there is much more to be understood about the technical aspects of soil erosion and about the soil conservation techniques. However, there is an even greater challenge in understanding the non-technical aspects associated with it. Soil conservation methods have developed in a phased manner over the period of time through research and case studies. During the first half of this century, emphasis was laid mainly on the traditional North-American style of conservation, involving manipulation of the land to control surface run-off by using graded channel terraces. In the 1950s many agronomic practices were also developed to supplement the traditional method. However, research carried out during the 1970s in many countries and at international research centres like ICRISAT and IITA, made workers and scientists to think that major modification were necessary in this direction. To achieve this, the three basic approaches namely, soil conservation is a good thing, co-operative programs, and financial incentives were made use of to find solutions to soil conservation programs. Various combinations of the above three elements were also tried. In parallel with the realisation in the seventies that new technical solutions are required, there was a parallel realisation that putting the concepts into operation is extremely difficult and that the problem of operationalisation of soil conservation schemes is widespread. The problem actually arises from a complex interaction between a large number of mutually interactive factors, namely, **political, social, and economic**. The basic political aspects include political policy, state land use and state forests, land allocation and legislation. Social aspects include ownership and tenure of land, fragmentation of land holding, social significance of cattle and reluctance to move and to change. Economic constraints include the degree of risk, the time scale of soil conservation, and the beneficiary and the payee. A great deal of work is therefore required to be done since there is now available a much better base. This is inevitable because of the fact that the decision-makers need more reliable evidence on which to make their judgements and to frame future policies. This paper therefore aims at analysing the above mentioned mutually interactive non-technical aspects.

Key words: soil erosion, soil conservation, surface runoff, policy, land use, land holding

INTRODUCTION

Soil conservation is today recognised as one of the main responsibilities because of the fact that soil erosion is recognised as a serious threat to man's well being. It is evident from the fact that most governments today provide active support to programs of soil conservation. Studies of the effect of erosion on early civilisation have shown that a major cause of the downfall of many flourishing civilisations was soil degradation. Whether long term changes in climate have affected past soil degradation or not is a matter of debate. However, the devastation we see today is essentially a man-made phenomenon.

The growth of erosion research has taken place mostly during this century. In this the USA has maintained a commanding lead in research on the erosion process and in studies of the application of conservation practices. Several programs at national level have been reinforced by international programs. South African Regional Commission for Conservation and Utilisation of the Soil (SARCCUS) for example pioneered this approach about forty years ago. The international agencies like FAO, UNEP, and UNESCO have now become active in action programs. International

agricultural research stations particularly ICRISAT in India and IITA in Nigeria have started multinational research on erosion from the 1970s. The result of such research showed that there is a need for major modification in this direction. There has to be a new approach and this has now led to new and systematic effort to develop solutions appropriate to the widely varying conditions in the developing countries of the world. Development of technical solutions however, forms only one part of the problems relating to soil erosion. The other and definitely the most important part of the problem is to operationalise the technical solutions on the ground. This means putting the policies and technical solutions into practice. In this regard there have been a number of realistic appraisals of the soil conservation movement in many countries, especially in the USA. These have shown that success does not automatically follow good intentions. Two examples of early reviews are Held and Clawson (1965), and Simms (1970). In the Southeast Asia, soil conservation programs are much less intensive as compared to other parts of the world. Despite of having well-planned and well-intentioned soil conservation projects, operationalisation of many soil conservation projects have been disappointing for example, the Greening Program in Indonesia was a well conceived and well planned project and it also had political and financial support but in operation the project failed. This problem actually arises from a complicated interaction of a large number of aspects. These aspects may be divided into three main categories - **political, social and economic**. And this is where the need for mediation between these three mutually interactive aspects arises. This paper therefore, aims at discussing the various aspects mentioned in light of global situation of today.

BASIS AND SCOPE

Treating Soil as an Economic Good

That soil is an economic good is not and can not be a matter of dispute. As the conventional definition of economics goes – **the science which studies human behaviour as a relationship between ends and scarce means (resources) which have alternative uses** (Kessler 1997). Soil definitively has many uses and is increasingly becoming scarce in many places due to various reasons. This on the other hand means that it can not satisfy all the alternative uses simultaneously. The main alternative uses include, use in agriculture, development of the residential sector, roads and infrastructure services, recreation and environmental protection. Increasing scarcity of land due mainly to explosion of population and decrease in productivity provide the rationale for adoption of demand management in soil conservation and management. Demand management refers to the policies that relate the values of soil to its cost of provision and motivate users to adjust their usage in the light of those costs. It entails treating soil more like an economic resource as opposed to an automatic public and inexhaustible resource. Such a service is typically characterised by centralised planning, reliance of bureaucratic instruments, wasteful usage and inefficiency. Further a policy hierarchy most appropriate to given local conditions and objectives must be developed. This hierarchy must comprise action at three mutually reinforcing scales – **enabling conditions, incentives for users, and projects and programs**. Enabling conditions are the responsibilities of the government and include institutional and legal changes, utility reforms, privatisation, and examination of how macro and micro policies affect soil conservation and land use. Incentives for users to change to change behaviour may comprise both market or non-market based measures. These are also described as economic as compared to coercive and normative incentives (Briscoe 1997), and as price-related versus regulatory instruments. The third tier of actions comprises projects and programs. This may include, for example, conservation tillage, zero tillage, mulching,

and promotion of other soil and erosion protective measures involving efficient technology. The three mutually reinforcing scales therefore, need to be dealt under the three main categories – **political, social, and economic**. Further, proper mediation between the three is a must for achieving the highest level of success in all soil conservation projects.

POLITICAL ASPECT

Political policy

Policies at government level are generally not translated into action programs unless there is the political will to implement them. The situation in many countries today is such that plans are made for conservation of natural resources but such plans are not operationalised. Conflict at national level policies exists between the short-term objective of self-sufficiency and the long-term maintenance of the country's land resources. The understandable desire of national governments to increase food production invariably leads to excessive pressure on the land (Dudal 1981).

The exploitation of land by unwise use is not limited to developing countries alone as is evident from the picture of it occurring in the mid-western grain producing areas of the USA (Shrader 1975). The massive contribution, which is being made by the USA to the rest of the world need for grain, is being achieved at the expense of irreversible damage to the country's soil resources.

State land and state forests

Developing countries all over the world have a long history of land reserved for some agency of power. This was the case of **crown land** under British colonial rule. In independent provinces, kingdoms and under feudal systems the land automatically belonged to the ruler with the exception that some form of title was granted in return for services rendered for social purposes. Many developing countries have a sizeable proportion of land, which was previously reserved. In India vast amount of land was under the landlords during the landlord rule (called the Zamindari Pratha).

On one hand the authoritarian management has declined and on the other hand the population pressure and land hunger have increased. Further, there are examples where the land was deliberately withheld from settlement because it was ecologically unsuitable. This is particularly true of steep mountainous land in the humid tropics, and destruction in these areas is occurring as a result of small-scale peasant farming. Examples of such farming are steady climb of cultivation up the mountain slopes in Central Java, in Kenya, in the lower Himalayas of India and Nepal, in the Andes in South America. Such farming called the shifting cultivation (locally called the Jhum) in India is now a major threat to the ecology of the sub-Himalayan region. Many political leaders neither know nor care what is happening, some of them know but hardly cares, and some know and think about it. But unfortunately, none are doing anything about it. In some cases it appears that political will exists but the politicians are not clear what solution could be offered to this problem.

Allocation of land

Allocation of land to non-landowners is a government policy in many countries. In India with a population of about 1.0 billion, the government policy is **land for the landless** and 50.0% of all

state or public land must be allocated to people who do not own any land. This policy for a country like India has come under criticism due to the fact that such a policy is neither realistic nor practical. This is because the country has been intensively farmed and densely settled for centuries and has no reserve of spare land suitable for cultivation. The common land is usually worn out, or eroded or so steep that it is only suitable for forestry. This policy needs to be reviewed as early as possible. Further, breaking up large land holding into small units in India is due mainly to the social rules that exist today. The same situation exists in many other countries like Iran, Kenya, Sri Lanka and Bangladesh where fragmentation of land holding has taken place for some reason or the other. Brandt Commission report points out that reallocation of land is not likely to solve the problems of the rural poor (Brandt 1980).

Legislative measures

The main consideration that comes to one's mind is that, **“should government try to impose a certain set of rules for land use through legislation?”** In the year 1970 FAO made a review of the records on legislation and suggested that legislation can not provide the solution for two basic reasons. First, it is morally wrong to force on the populace theories and practices whose validity has not been proved. Secondly, in countries having powers to control land use and enforce soil conservation measures, it has been possible to pass the legislation because there is a widespread acceptance that the misuse of land is an offence against society and is socially unacceptable. When this approach to land use is accepted by the community it is not necessary to invoke legislation. It can be pointed out that soil conservation programs can only be effective when they are moved from the **bottom to top** i.e. by full involvement of the rural population (Dudal 1981). Schemes imposed from the **top** will not succeed even if they are technically correct.

SOCIAL ASPECTS

Land ownership and land tenure

Historically it appears that everyone has an automatic right to own land and this is more clear in developing countries but with partial justification. Enough land was available in the past for everyone and increase in population meant bringing more land in use. This is especially true in dominantly agricultural economies since there are no alternatives to working on agricultural land. In developed countries people have other jobs to do especially in the industrial sector. However, in developing countries agriculture remains the main occupation. This means that only the expansion of industry can ease the problems of those who have no opportunities to work on the land. There are certain undesirable pressures on land due to some form of land tenure. Community ownership can lead to mismanagement, particularly over-grazing by cattle or removal of firewood. This problem was overcome in central India due mainly to the works done by the extension workers at ground level. In this part of India the villages decided to rest and restore their main hill-grazing area, and operated a self-imposed and self-regulated program of zero grazing followed by intensive planting of fuelwood trees. This demonstrates how such a problem can be overcome. Short-term cultivation rights, share cropping tenancies and absentee landlords are few other aspects of land tenure that can lead to soil depletion. These problems are not only existent in developing countries but are also present in the developed countries (North Central Farm Management Research Committee, USA, 1951). In India there are entrance rights of villagers to graze certain areas, to cut fuel wood, and to take timber for making agricultural implements. These factors are so ancient and so complex that

solution satisfactory to all situations is hardly possible to arrive at, resulting in difficulty to manage efficiently even the reserved forests.

Fragmentation of land holdings

Fragmentation of land holdings is a result of the concept of a universal right to own land. This is particularly true for countries like India (Shaxson, 1981). This has led to adopt **land consolidation program** in some states of India, for example in Uttar Pradesh. This means putting all the agricultural lands in a common pool and redistributing the same in more manageable manner. Successive division of land holding is not only a problem of the developing world but there are examples from Europe and North America too. The basic facts therefore remain that fragmentation is a serious constraint on optimal land use.

Significance of cattle

This is an important aspect as far as India and Africa are concerned. In Africa, cattle are symbol of status and wealth. These two aspects apply equally to Indian context too coupled with an added complication of religious significance of the cow. All these lead to more livestock than are desirable on one hand and low standards of livestock management and production on the other hand. All these lead to high stress on land resources, which by no means are unlimited.

Lack of will to move and to change

Human beings usually do not like to move from the accustomed environment. Sporadic cases of such movements have been reported from various countries like Sudan, India and America under irrigation and other rehabilitation schemes. However, a trend has not been set in this direction. India in this regard is reported to have the worst problem of all. The over-crowded, over-grazed, and over-cultivated foothills of the Himalayas are disintegrating so fast that the sediment load of the main rivers is higher by an order of magnitude than comparable rivers on other parts of the world. However, there is hardly any possibility of resettlement of the people on the plains due to the fact that the plains are already settled to capacity and there appears to be no practical solution to this problem.

As regards change, it occurs seldom and that too very slowly. Change always requires a certain amount of financial involvement and this is one of the major constraints as far as marginal and small farmers are concerned. For them agriculture is an art of survival and not a business as is for the farmers of the developed countries where the object is to maximise yield and profit. It is not that the farmers are not willing to change but they are locked in an inescapable economic prison from where escape seems difficult.

ECONOMIC ASPECTS

Degree of risk

Agriculture being the only source of income for the marginal and small farmers, they are not prepared to accept any risk for the improvement of this farming system. However, there seems to appear a solution to this problem and that is to put money into the production system in the form of risk capital. In this regard, subsidy to the price of seed or fertiliser and offering support prices to

farmers has been tried. However, all these only help the farmers who have some capital of his own to invest. This entails that the money should be used to underwrite the risk of failure. This kind of approach will help the marginal and poor farmers to change and accept challenges.

Soil conservation and management time scale

A scale appropriate to measure the benefits of soil conservation programmes is needed to be applied in all cases. This scale is usually a long time scale of 50-100 years. Unfortunately, the managers of our national land resources are also our political leaders, and their time scale seldom extends beyond the date of the next election. Accordingly, they are not interested in long-term conservation. Even shorter is the economic cycle of the farmers. As Dudal (1981) quoted – **the first requirement for effective soil conservation is that the income from the farm is large enough to provide sufficient proportion for the maintenance of the soil capital.** However, for the majority of small and marginal farmers, the problem of today is of prime concern rather than the future problem.

The beneficiary and the payer

Soil erosion control is required not only for on-site benefits but also for other reasons such as downstream damage caused by sedimentation which in turn causes increased flooding, reduced hydro-electric power, interference with irrigation. This is particularly true in case of northern and north-eastern part of India. In countries where the farmers are poor their ability to contribute towards the cost of conservation works is practically non-existent. Under such conditions the state should pay due to the fact that it is a long-term interest of the state or of the nation. Rosenberry et al (1980) concluded that the cost of erosion control to farmers is greater than the economic return from controlling erosion. However, it is not an easy task to decide the relative priorities only based on economic terms. The cost involved in soil conservation measures is easy to calculate than to determine the benefits. However, the most difficult part is to quantify the benefits in cash terms. Benefits like job creation, input of money into the economy can be considered for the purpose. However, there still remains some intangible benefits like restoration of ecology, long-term soil productivity, improved quality of life, better health, balance diet, and reduced drudgery among the rural people. This justifies the findings of Libby (1980).

CONCLUSIONS

Based on the discussion and the critical issues presented above it would suffice to say that the necessity for a much greater effort in examining this problem is now widely accepted (Marsh, 1980). Further, there are available now strong bases for further research. Studies conducted in India also reveal this fact (Nobe and Seckler 1977). The extent to which soil erosion and soil degradation can be tolerated needs to be studied on model basis for specific locations as revealed by Mannering (1981). Studies conducted in El Salvador has produced an useful model suggesting that at least in those circumstances a soil programme can be justified in economic terms over a short time scale. It is obvious that a great deal of study is necessary in this direction to help decision-makers have more reliable evidence to formulate policies and plans. Any future work on this subject must therefore, include the above mentioned mutually interactive and reinforcing non-technical aspects.

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ABBREVIATIONS USED

FAO	Food and Agricultural Organisation
ICRISAT	International Crop Research Institute for Semi Arid Tropics
IITA	International Institute for Tropical Agriculture
SARCCUS	South African Regional Commission for Conservation and Utilisation of the Soil
UNEP	United Nations Economic Program
UNESCO	United Nations Educational, Scientific, and Cultural Organisation
USA	United States of America

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