

## **POLICY – DEVELOPMENT ISSUES IN SOIL & WATER CONSERVATION**

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### **Abstract**

Estimates of soil erosion and forest degradation are increasing every year in the developing countries. Even though there is some awareness of the problems of soil erosion yet much is not achieved by way of conservation. The causes of soil erosion are non-anthropogenic and anthropogenic. While technologies for managing non-anthropogenic causes are available, the anthropogenic causes are the least addressed and managed. The anthropogenic causes include the people and their animals, and surprisingly the Governments and the agents of change. The Governments and their agents of change extensively contribute to soil erosion, deforestation and land degradation. Whatsoever, and wherever the Governments do some thing it is done in piecemeal and on a temporary basis. To achieve success in soil and water conservation there is need of a holistic approach paying attention to policy, institutions and operations. The status of policy-research institutions in selected developing countries of Asia-Pacific and Africa is reported. The status of the many aspects of these components with particulars reference to the management in densely and sparsely populated countries, the role of agents of change and governance and cost effective and time-saving technologies is discussed.

Additional Keywords: people, governments, population, institutions, technology, participation

### **Introduction**

Soil and Water Conservation have been promoted and emphasized for well being of human society very vigorously during the past fifty years. However, inspite of this the estimates of soil erosion, forest degradation and land degradation are increasing every year in the developing countries. Even though some awareness of the problems has been created, yet not much is achieved by way of conservation and productivity. Why? The paper attempts to answer this question, based on personal experiences in Asia, Africa and the Pacific.

### **Role of People and Governments in Causing Soil Erosion**

The causes of soil erosion are non-anthropogenic and anthropogenic. While technologies for managing non-anthropogenic causes are available, the anthropogenic causes are the least addressed and managed. The farmers and their animals are generally considered to be the major anthropogenic cause of soil erosion. However, it is generally neither recognized nor articulated that the Governments and their agents of change are no less responsible for soil erosion. This information is reported from Indonesia, India and Thailand (Tejwani, 1990). To trigger erosion on a wide scale and then to expect the farmers or beneficiaries to accept the blame and also to share the costs of rehabilitation is not a fair game. The Governments and their agents of change must use the land, forests, water, mines etc. properly simultaneously.

### **Need of a Holistic Approach in Soil and Water Conservation**

Whatsoever and wherever the Governments do something to promote soil and water conservation, it is invariably done on a temporary, piecemeal and adhoc basis. To achieve success in soil and water conservation there is need of a holistic approach paying attention to policy, institutions and operations framework, which itself will be anthropocentric. The status of policy-institutions-operations frame work in some developing countries of Asia-Pacific and Africa is reported in Table 1 (Tejwani, 1986; 1992).

Programmes are implemented by Sectoral Departments concerned with Land Use e.g. Agriculture, Forestry, Animal husbandry, Soil Conservation, Roads, Irrigation, Horticulture, Hydropower. Programmes include demonstrations, extension services, operations like planning, projects formulation, implementation, maintenance, monitoring, evaluation and coordination. Training refers to University or Vocational or In-service teaching/training.

Policy will include awareness, legislation (land policy, forest policy, water policy, population policy, socio-economic policy etc.) and creation of enabling institutions. Institutions to implement policy would include research, demonstration, operational projects, development of technology packages, training/teaching at all levels and agencies to extend (Government, Non-Government and Voluntary). Operations will include programmes for soil and water conservation, watershed management, forest conservation and rehabilitation etc, delivery of goods and

services in the field on time at site, being sensitive to the social, cultural and economic needs of the people. Any one component in isolation of the other components will not yield much.

**Table 1. Status of policy and institutions in selected countries of Asia-Pacific and Africa.**

<i>Country</i>	<b>Policy</b>	<b>Legislation</b>	<b>Programmes</b>	<b>Research Institutions</b>	<b>Training Institutions</b>
Afghanistan	3	4	4	4	4
Bangladesh	3	3	4	3	4
Bhutan	4	4	4	4	5
Burma	4	3	4	3	4
Cambodia	4	4	5	4	5
China	2	2	1	1	3
India	2	2	1	1	2
Indonesia	1	2	1	1	3
Laos	4	4	3	3	5
Malaysia	3	3	2	2	4
Nepal	3	1	2	3	3
Pakistan	3	2	2	2	3
Philippines	3	3	2	2	3
Sri Lanka	3	3	3	3	4
Thailand	3	3	2	2	3
Vietnam	4	4	5	4	5
Cook-Islands	4	4	4	4	5
Fiji	3	3	3	4	3
Tonga	4	4	4	4	5
W. Samoa	4	4	4	4	3
Sierra- Leone	4	4	5	5	5
Tanzania	4	4	5	4	4
Zambia	4	4	5	4	4

Status is graded as : 1 = Excellent; 2 = Good; 3 = Fair; 4 = Poor; 5 = Very Poor.

China, India, Indonesia, Malaysia, Nepal, Pakistan, Philippines, Thailand, etc. have excellent to good status of policy, legislation, programmes, research and training institutions. Some other countries in Asia & Africa have fair to less than satisfactory status of these components. In fact in some of the countries of Africa, even the institutions which were built by the colonial powers have deteriorated or disappeared. Some critical aspects of these components are discussed and high lighted here.

### **Two Important Keys for Soil and Water Conservation Strategies**

There are many keys for success of soil and water conservation. However, those keys are generally available to some extent. The two important keys which are mentioned here are based on extensive observations in the countries of Asia-Pacific and Africa.

#### *Population density*

The early scientific articulation regarding population versus limited natural resources was by Malthus & Ricardo, in the first quarter of the nineteenth century (Held and Clawson, 1965). Each land use system has an upper limit to being sustainable and its ability to provide food to the people. As the population increases beyond the limit of sustainability, the farming system breaks down in respect of productivity as well as the natural resources. Once a system breaks down or is on the verge of breaking down, either there should be a technology upgradation or the population density must decrease.

It is generally believed that mountains and hills are less densely populated than the plains. At present it is a myth. For example, if population density is calculated per sq. km of cultivable land, it is 1432 persons in the Indian Himalayas as compared to 432 for whole of India. This is also true of Afghanistan, Pakistan, Nepal, Bhutan, Java, Bali and many other countries. The issues of very dense populations in some countries can be ignored at a great cost of degradation and destruction of production base, natural resources and bio-diversity. Given the same agro-climatic conditions the nature of soil and water conservation, and land and water management will vary with the

density of population. For example the agro-climatic and edaphic conditions in Kerala State of India and Sierra Leone Country of Africa are almost similar, yet the population densities and the land use statistics are quite different (Table 2).

**Table 2. Programme approach vis-à-vis population.**

Item	Kerala State (India)	Sierra Leone (Africa)
Area (Sq. Km)	38863	72300
Population density (Person/sq. km)	655	48
Rural population (%)	81.3%	Almost entirely rural
Climate	Tropical humid	Tropical humid
Annual rainfall (mm)	2807	3000
Land use (sq. km) (% of total area)		
Agriculture	21800 (56.1%)	5440 (7.5%)
Forest	10810 (27.8%)	63050 (87.2%)
Tree crops	640 (1.6%)	-
Irrigated area	13610 (62.4%)	-
Fertilizer use (kg/ha)	45.2	-

In view of the very dense population, excessive forest degradation and soil erosion in Kerala, the emphasis is on land reclamation and rehabilitation, increased area under home gardens and tree cover, fertility management, and irrigation to increase production, and conservation. On the other hand in Sierra Leone the population is sparse, forest and vegetation cover is in good shape. Hence land degradation and soil erosion are less; the emphasis will be on safe forest clearance, soil conservation and soil fertility and water management.

#### *Transfer of Technology and People's Participation*

Soil and water conservation is a multi-disciplinary technology. It is generally believed that technology is available for transfer. Both the traditional and modern/refined technologies are available. Traditional technologies (bench terracing, water harvesting, water conveyance and application, home gardens, silvopastoral, & agro-silviculture systems, sacred groves, etc.) are time tested, socially acceptable and easily available. Refined (also simple) modern technologies based on research are also available.

The use of soil and water conservation by the people is also not new. The management of land-water-vegetation had been achieved by the people by their wisdom and traditional knowledge, due to their needs or faith or trust or enforcement. Given this back ground it is surprising that we are not able to promote/sell/push these programmes on a large scale. Why? At the outset one reason for this antipathy is the responsibility of the Government or its agents to cause soil erosion/land degradation etc. as pointed out above. The second cause of the lack of enthusiasm for the soil and water conservation programmes by the "people" lies in the approach of the Governments/agents of change/voluntary organizations in the definition of the "people" itself.

#### *Who are the people?*

The "people" are "generally" categorized by the agents of change (government departments, development agents, NGOs, etc.) as the farmers, forest dwellers, tribals and all so called "direct beneficiaries". However, in a broader sense, those who man the government departments, development agencies, NGOs, etc. are also the people. The participation of direct beneficiaries to receive services and to implement activities is no doubt essential. However, the job remains incomplete unless the agents of change, who deliver services also fully participate in their own activities.

#### *What attracts the beneficiaries?*

The current methods of extension and the intentions to serve have given mixed results- more indifferent than success stories. It has been observed that the beneficiaries are more interested in on-site and in a short term benefits. For example, they would welcome development of water resource and irrigation system rather than sediment control, irrigation and hydropower generation for use downstream. They may be interested in sediment control and

hydropower generation if their contribution to these off-site activities is recognized and either compensated by delivery of power at the site within the watershed or by cash payment for their contribution.

The beneficiaries will participate vigorously if they get their benefits in short term rather than in long term. They do not get enthused by the prospect or promise of soil conservation for the next generation or availability of timber 10 years or more down the line. They are interested in direct personal benefits like irrigation, increased crop and grass yields, animal husbandry, goods from forests, etc. rather than indirect community benefits of betterment of environment, underground water recharge, which springs up elsewhere and benefits others.

The beneficiaries would opt to participate for community welfare such as schools, hospitals, roads, tanks, ponds, *nala* bunding, etc. as long as they can share benefits of these activities. In short, the beneficiaries will participate, and even contribute to watershed management as long as they get short term, on-site, direct and tangible benefits. They would not participate for altruistic reasons. This is now being recognized and many programmes are emphasizing upon income generation activities (Dave, 1998; LUCI, 1999). Once their trust is secured, they will volunteer ideas and contributions (Padmaiah and Ansari, 1998).

#### *Role of Agents of Change*

So far only the role of farmers or beneficiaries has been mentioned. On the other side are the agents of change. They play a vital role in achieving peoples' participation. First and foremost, these agents of change have to be sensitive to the urgent needs of these people. This calls for identifying a broad spectrum of benefits at the planning stage. Then consulting and discussing the local needs and benefits which will trigger enthusiastic and committed participation. Having identified the needs, and the goods and services to be delivered, it is important that they are delivered in time. For example, if the seeds, saplings, fertilizers are not delivered on time, the farmer not only loses his crop but also gets disillusioned. Once this happens, it is difficult to bring him back to any type of participation.

Apart from the timely delivery of goods and services, there is an element of cost effectiveness and efficiency of delivery. It is appropriate that there is a system of single window delivery so that the farmer or beneficiary does not have to chase many functionaries. As anyone else in the society, he also has limitation of time, and limited resources. Only when the beneficiaries and the agents of change function in unison, then alone do the development activities succeed.

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