

Losing the Ground Beneath our Feet-Conserve Soil

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Editorial

Soil is a precious, non-renewable natural resource. The time it lasts and supports the life forms including humans will depend upon the way we use it today. Unfortunately, this resource is subject to utter negligence as well as over exploitation. Soil erosion which is literally an early death of soil, is a complex phenomenon governed by various factors, such as rainfall erosivity, soil erodibility, slope, land use, and conservation measures. Fragile soil in hilly areas including forests and agricultural land is susceptible to erosion by water. Loss of vegetation and erosion promoting cultivation practices on the hill slopes has deteriorated the quality of land over a vast area. The natural or geological erosion is slow, and it has been occurring naturally since the dawn of time, but the rise of humanity has sped up the process. The accelerated erosion on our land has become more severe due to the anthropogenic interference. Rampant deforestation, degradation of forest areas and lack of conservation and protective measures on agricultural lands has led to irreparable loss of huge quantities of our soil. We depend on soil for our sustenance but ironically it is the most neglected commodity. The dirt-cheap soil cannot be ignored for long, and history bears testimony to it. Soil has played a role in the rise of human civilizations and if misused and neglected it can lead to their downfall.

Soil is an integral part of our environment, no matter how advanced and hi-tech our lives have become, we still owe our existence to a six-inch layer of topsoil soil. Ecological downfall and loss of valuable cultivated land even today can lead to annihilation of civilizations, migrations, wars and invasions. Soil degradation through erosion is regarded as one of the possible causes of downfall of Maya and Mesopotamian civilization. It is widely believed that it takes nature 1000 years to form an inch of soil, and what takes nature so long to build; we destroy that in days.

Losing soil through erosion is like gradual loss of our capability to produce food and earn our livelihood. Someone has rightly said that soil erosion is any nation's worst enemy - far worse than any outside enemy coming into a country and conquering it because it is an enemy you cannot see vividly. The loss of nutrient rich topsoil affects the farmer's ability to grow crops in two broad ways. Firstly, it reduces the inherent productivity of land, through the loss of soil per se, and through nutrient loss and degradation of the soil's physical structure. Secondly, it increases the cost of production. When the fertile topsoil is lost, farmers can only maintain land productivity by substituting nutrients in the form of fertilizers. Therefore, the farmers who lose topsoil from their land may experience either a loss in land productivity or a rise in inputs. But, if productivity drops too low or costs rise too high, they will be forced to abandon their land.

A study by the Royal Commission on Environmental Pollution (UK) concluded that approximately 30 per cent of the world's arable

crop land has been abandoned because of severe soil erosion in the last 40 years. It is estimated that one-sixth of the world's soil has already been degraded by water and wind erosion. Protecting and conserving soil should be our foremost priority. The marginalized and vulnerable population in the hills will suffer the most from the impacts of land degradation because they often have fewer resources to fall back upon. Their vulnerability is exacerbated by factors like: difficult living conditions, remoteness and limited livelihood options. The soil detached by accelerated erosion may be transported considerable distances giving rise to 'off-site' problems. The movement of sediments and pollutants into water courses can lead to the silting-up of dams, disruption of the ecosystems of lakes, and contamination of drinking water. Increased downstream flooding may also occur due to the reduced capacity of eroded soil to retain water. The increased sediment load in the water courses or rivers can have detrimental effects on hydroelectricity generation. The muddy water of our rivers is a glaring evidence of accelerated erosion taking place in their catchments.

Politicians, bureaucrats and scientists in developing countries have been harping on the potential of hydro-electricity generation and earning from Carbon Trading in future, however, efforts for conserving soil, land and ecology need to be expedited now, or else not much would be left there to conserve, and we shall lose the ground beneath our feet forever. Presently we lack a comprehensive knowledge about the status and magnitude of the land degradation process and its level of impacts on our development and rural livelihood system, therefore, further investigation and research in the field is imperative. An efficient network of hydrologic and sediment monitoring stations is needed, so that the sediment load data is utilized to determine the Sediment Production Rate from different land use categories in watersheds, so that appropriate conservation measures are put in place accordingly. In many areas unscientific cultivation on hill slopes, non-adoption of proper soil conservation techniques, forest encroachment, deforestation and over exploitation of land; for crop production and sustaining animal population, lead to enormous soil erosion. The predicament is more likely to worsen in future due to climate change and changing demographic patterns and ever-increasing demands of burgeoning population. The top soil loss is huge and irreparable, and amounts to losing quintals of fertilizers from our fields every year, in addition to valuable organic matter and micronutrients.

Moreover, wastage of this resource through erosion is associated with serious economic, environmental, social, and geo-political consequences. Meeting the demand for rural livelihood, energy and other human requirements depends upon the preservation and improvement of the productivity of land. The forests are already under a heavy biotic pressure. Because increasing population, per capita availability of agricultural land is further declining, and land holdings are getting further fragmented. Notwithstanding small arable land

resource, the agriculture remains to be main source of livelihood to the people. The cropping pattern is gradually changing-becoming more commercial and market oriented. Losing soil and its fertility through erosion and other degradation processes can make this industry (agriculture) more external-inputs-based and environmentally unsustainable. The preservation and protection of our soil through appropriate technologies and farm level efforts underpin the long-term sustainability and economic viability of our agriculture industry. Besides, spatial and natural characteristics, land use and farming practices determine the type and degree of soil degradation. Despite all the efforts through various watershed management and soil conservation projects, preventing effectively and inclusively the further

degradation, seems uncertain. Neither heavy investment nor any other government intervention alone can bring the change. Experience has shown that success of any soil conservation model or land resource management programme requires a participatory approach and the active involvement of rural communities and individuals. Small measures, like adoption of appropriate soil and water conservation practices by farmers on their fields can make a difference in protecting lands and deterioration in soil health. However, institutional intervention using regulations, better policy mix, agricultural support services and formulation and enforcement of appropriate legislation is important too.