SOIL EROSION -A CASE STUDY OF NORTH BIHAR PLAIN

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Abstract

The process of soil erosion has been in existence since man appeared on the earth. Hence it is not a new thing . But when the mother earth conceived agriculture and gave birth to crops, it took a new meaning altogether. For an area which existence is solely wedded to agriculture protection of soils becomes the most urgent need.

The denudation of soil particles by natural agencies like rains, sun, wind, running water and waves is called soil erosion . But in the study area, man has emerged as potent dangerous factor of soil erosion . This is why Dr.Bennett has rightly opined that "The vastly accelerated process of soil removal brought about by human interference with the normal disequilibrium between soil building and soil removal is designated as soil erosion . The area is a victim of human interference with soils.

Introduction

National planning committee Report on soil conservation and Afforestation studied in depth the menance of soil erosion. But with the marching passage of time since 1948 (Report submission period) the area underwant sea-change . Deforstation, shifting courses of numerous rivers, especially the gandak, the koshi and the Bagmati, prevalence of faulty practices of cultivation, lack of natural postures and grassland, intensive farming without necessary inputs, etc .have combined together brought about tremendous pressure on soils and soils have lost its vitality.

FACTORS OF SOIL EROSION :

General slope condition, nature of the soil and nature of plant cover are important factors determining soil erosion. Among all these factors, run off plays dominating role as the area receives rains of concentrated natures. The run-off itself is influenced by the intensity of rainfall in the catchment, slope of the land, vegetation of the catchment area, atmospheric conditions such as temperature in the catchment area, atmospheric conditions such as temperature, humidity, etc. And other miscellaneous

factors like changed conditions of surface. such as the methods of cultivation adopted and other practices of farming and grazing also affect soil erosion. Besides these, there are some less variables, e.g., mechanical relations of gravitational creep, sliding soil granulation, fragmentation, dispersion, alternate freezing and thowing and sedimentation concentration of rainfall – the amount and rate of run-off depend upon the amount, intensity and duration of rainfall . The more concentrated and intensive the showers, the more forcefully they strike the surface and the greater, the run-off (erasion loosening the particles farming the deep ravines) . it has been estimated that rainfall of abnormal intensity once in 50 years is sufficient to cause the heaviest erosion in one single year compared to the erosion caused in the previous 49 years. A heavy downpour within a shart time, causes as much damage as all the other rains during the year put together. A gentle shower is absorbed easily by the soil and causes less damage than a heavy downpour, which loosens the particles and forms deep ravines.

According to Mr . M.S.V. Raman Rao the north Bihar plain is relatively an area of moderately high rains . The crucial period of soil erosion by rainfall is between August and October when heavy showers are intermittently received. Almost whole incidence of rainfall with intensity of more than 4.25 cm per day flows to cause surface run-off . from this point of view the west Champaran, the East Champaran, Saharsa, Katihar, Purnea, Seohar, Sitamarhi, Darbhanga, Madhubani, Khagaria, Begusarai, Samastipur, Muzaffarpur, Siwan, Saran and Gpalganj are prone to moderate to heavy soil erosion .

Another factor which affects soil erosion in the area is the general slope of the ground. except someshwar & dunhills of West champaran the entire area has almost gentle slope. The loss of soil due to erosion as estimated by national planning committee is as such.

The area under study is almost flat ground. Except saharsa, sitamarhi and seohar districts sheet erosion is prevalent. Hence more loss of soil takes place during high intensity run-off. As soils of the region are mostly of fine grained nature, so they are resistant to erosion. Areas affected by soil erosion have coarse grained sandy soils. The diaras of the Ganga, Bagmati and Kosi are highly prone to soil erosion. Soils of some parts of west Champaran Seohar, Sitamarhi, Samastipur, Begusarai, Khagaria, Saharsa and Madhepura have high dispersion ratio and liable to serious erosion . These areas remain affected by soil erosion during the floods by the swirling currents of the

streams. The Gandak, Adhwara groups of rivers, Bagmati and kosi are notoriously famous for bank erosion .

CAUSES OF SOIL EROSION :

Soil erosion is not in menancing form in the area under study . Deforestation, destruction of pastures I and faulty method of cultivation, the nature of the crops groups and socioeconomic factors combined together cause soil erosion in the area. Except west champaran, purnea, East Champaran and katihar the entire north bihar plain is almost devoid of vegetation cover. Hence the entire region is as such-

Table – 2

Sl. No.	Nature of land cover	Proportion of loss (ton)
1.	Forest with normal ground	1
2.	Forest burnt annually	20
3.	Well managed pastures	14
4.	Grass land	130
5.	Completely bare ground	3250

Source : National Planning Committee, New Delhi, 2007

The perusal of table reveals that the area under study falls under fifth category.

The consequence of it is that during rainy season majority of water drain to the bay of Bengal by surface run-off. Its effect on water and soil loss have been computed by Mr. R.M. Gourle. His finding are as such –

Table – 1.2

Sl. No.	Nature of cover	Loss Of water
1.	Forest	1
2.	Grass	27
3.	Bare land	125

Another cause of soil erosion is the loss of pasture grounds. After harvests cattle are left free to roam at random in the fields. Its consequence is that the ground is badly trampled by the hooves of the livestock. Thus, the ground becomes

entirely uncovered, worn and then so that rain drops of high intensity begin to fall directly on the soil pudding the surface and clogging up the pores with mud. Thus infiltration of water into the soil is reduced and the run of the water increases. All this invariably leads to a deterioration in botanical composition and an increase in the growth of weeds as well as an increase in the area of bare ground. Almost the entire area is prone to overgrazing and, in turn, face erosion of soil on massive scale.

The entire study Area is arable in nature. Crops grown vary widely in their affect on erosion losses. While barley, oats and wheat have " low units of index of soil lost" corn, sorghum, cotton, soyabeans have higher unit of index but rice and cane account for very little of loss. Rice, wheat, maize and sugarcane are the major crops of the study area. Hence erosion of soil is minimized.

CONCLUSION :

The area under study is chiefly affected by the soil erosion caused by run-off. Agriculture, irrigation, navigation and water table are all affected. During the rainy season all streams of North Bihar remain in spate. Rapid run –off & consequent erosion lead to the deposit of an increasing mass of overflooding. It causes huge loss of standing crops and people and cattle. The National planning committee report on heavy erosion in recent years in Bihar, Assam, Bengal, Uttar Pradesh and Orissa are due to man`s invasion of the cradle of streams and trees The reclamation of swamps in the study area has also forced an exceedingly heavy run-off . It is estimated that the river Ganga alone from North Bihar plain carries about 6 times the quantity of silt carried by the Mississippi in the U.S.A.

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