

## Soil Conservation Measures for Production of Maize

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### ABSTRACT

An experiment was conducted on the farmers' field in Adesipada village of Khajuripada block of Kandhamal district of Orissa under NAIP, Component-3. As Kandhamal district was affected mostly by heavy rainfall during rain season, the crop lands were mostly damaged by the heavy rain and top fertile soil was eroded, so the poor tribal farmers they face a heavy loss. So this trial was construction of works was conducted during the year 2009-2010 in Khajuripada cluster with following objectives: 1) To increase farm production through suitable soil and water conservation measures; 2) To monitor the soil loss. The treatments are: 1) V-ditch at 10 m HI; 2) Miniature bund at 10 m HI; 3) Control. It is observed that the 15% of area was lost due to soil erosion in control. So V-ditch at 10 m H.I. should be recommended for North Eastern Ghat Zone of Orissa for production of maize. It conserved 40% higher soil loss compare to bunding and higher B.C. ratio of 1:25 compared to other treatment. It has also got the highest green cob yield of 115.5 q/ha compared to other treatments.

**Keywords:** Soil, Conservation measures, Heavy rain, Soil erosion, Maize

### INTRODUCTION

In India, over 60% arable lands are rainfed which support 40% of Indian population and contribute nearly 44% of total food production. These areas contribute to production of major proportion of nutritious (coarse) cereals (87.5%), pulses (87.5%), oilseeds (77%), rice (48%) and cotton (65.7%). In addition, a large population of India's cattle wealth thrives in the rainfed region. With a view to maximizing the crop productivity in these areas, the Indian Council of Agricultural Research, New Delhi launched the NAIP projects. This project is under Component-3, operating under OUAT in three districts viz. Kandhamal, Dhenkanal and Kalahandi. As Kandhamal district was affected mostly by heavy rainfall during rainy season, the crop lands were mostly damaged by the heavy rain and top fertile soil was eroded, so the poor tribal farmers they face a heavy loss. So these trials and construction of works were conducted during the year 2009-2010 in Khajuripada cluster. Many authors they define the effect of contour bund to check soil erosion. Subudhi et al. [1] and Samra [2] reported that renovation of terrace and plantation of fruit plants, timber plants improved biomass production, net returns, growth of crop, productivity, reduction of runoff in the range of 1.5-10.8 times, peak flow rate by 20 times and soil loss in the range of 1.2 to 5.2 times, as well as water table rise. Subudhi et al. [3] have reported that effect of vegetative barrier like Vetiver has increased the rice yield, decrease the

soil loss and decrease the runoff compared to farmers practice. Arora and Gupta [4] reported that there is a growing need for rain water management since 96 m ha out of 142 m ha of net cultivated land of the country is rainfed. Scientific use of these resources will definitely increase the productivity and conservation of resources like soil and water. Kumar [5] reported that impact of different soil & water conservation techniques viz. contour bunding, terracing, land leveling, smoothing and gully plugging, sowing across the slope, vegetative barrier, increase the Kharif crops by 25-30% [6]. Establishment of vegetative barrier with mechanical measures were more effective in controlling soil erosion ( $3.8 \text{ t ha}^{-1}$ ) over conventional method ( $9.64 \text{ t ha}^{-1}$ ) and run-off thereby making more moisture available for crop growth [7,8].

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**OBJECTIVE**

1. To increase farm production through suitable soil and water conservation measures.
2. To monitor the soil loss.

**TREATMENTS**

- T1. V-ditch at 10 m HI
- T2. Miniature bund at 10 m HI
- T3. Control

**RESULTS AND DISCUSSION**

It is observed from **Table 1** that the 15% of area was lost due to soil erosion in control. So V-ditch at 10 m H.I. **Figures 1 and 2** should be recommended for North Eastern Ghat Zone of Orissa for production of maize. It conserved 40% higher soil loss compare to bunding and higher B.C. ratio of 1:25 compared to other treatment. It has also got the highest green cob yield of 115.5 q/ha compared to other treatments.

**Table 1.** Yield soil loss and percent of area loss in different treatments.

Treatment	Yield of Green cob Kg/ha	Gross return (Rs)/ha	Cost cultivation (Rs)/ha	Net return (Rs)/ha	B.C ratio	Soil loss t/ha	Area loss in %
T <sub>1</sub> -V-ditch at 10 m HI	11,550	28,875	23,097	5,718	1.25	0.7	2
T <sub>2</sub> -Miniature bund at 10 m HI	10,350	25,875	24,747	1,128	1.05	0.5	3
T <sub>3</sub> -Control	8,560	21,450	21,447	-	1.00	-	15
<b>Mean</b>	<b>10,150</b>	<b>25,400</b>	<b>23,097</b>	<b>2,302</b>	<b>1.1</b>	<b>0.4</b>	<b>6.7</b>



**Figure 1.** Miniature bund with farmer.



**Figure 2.** V-ditch filled with deposited soil.

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