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Soil and Water Conservation Measures in Degraded Watershed of Kandhamal District, Odisha



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Abstract

A trial was conducted on farmer's field at Sudreju watershed of Kandhamal district of Orissa, India located within 20030'16" to 20031'24"N latitude and 84017'8" to 84018'14" E longitude with an altitude of 75m above mean sea level. The trial was conducted during 2001-02 & 2002-03. Kharif paddy (cv. Lalat) was transplanted. The project was conducted under National Agricultural Technology Project (Rainfed Rice Production System-7) at All India Coordinated Research Project for Dryland Agriculture (OUAT), Phulbani, Orissa with following objectives. To check erosion of upstream field. To store water in the field to a desired depth. To increase the rice yield. The following treatments were tried T₁- Brushwood structure T₂- Loose boulder structure T₃- No structure There were seven replications and design was R.B.D. Date of transplanting: August Date of harvesting: Last week of October to First week of November During 2001, there was no effective drought spell, but during (2002), drought spell occurred during 6th -14th, 18th -27th July, 14th -21st September, 28th September to 13th October and 20th October onwards. There was no serious incidence of pest and disease. Soil was acidic (pH-5.42). Organic Carbon-4.35 g/kg. Also loose boulder structures conserve more moisture compared to no structure. So loose boulder structures should be recommended in degraded watersheds of Kandhamal district of Orissa to conserve soil and moisture and to increase the yield of rice.

Results and Discussion

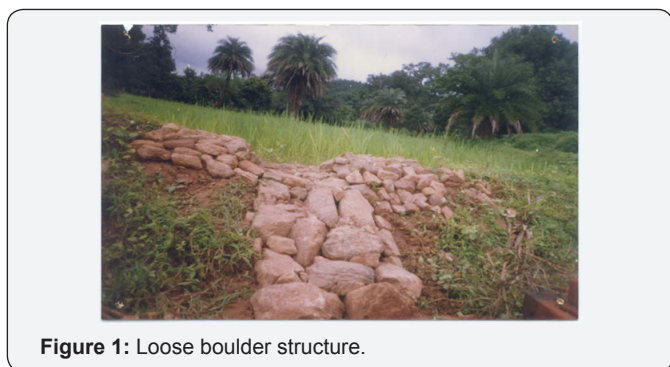


Figure 1: Loose boulder structure.

The rainfall was 1949.7mm during (2001) and 887.9mm during (2002). The grain yield of rice was shown in (Table 1)

in different treatments. It is observed that the grain yield was significantly higher in loose boulder structures (T₂) (Figure 1), compared to other treatments. The average cost was also low in loose boulder structure i.e., Rs. 80.00 per structure. In (Table 2), soil loss was shown which shows that loose boulder structures conserve more soil (0.055 tonne/structure) as compared to others. Also the area lost due to siltation in the down stream field was sh² area was lost in control and less area (0.12 m²) was lost due to loose boulder structure. Also structures conserve more moisture compared to no structure (Table 3). So loose boulder structures should be recommended in degraded watersheds of Kandhamal district of Orissa to conserve soil and moisture and to increase the yield of rice.

Table 1: Mean yield (t/ha) of different rice varieties along with cost of structures in different treatments .

Treatments	2001-02	2002-03	Mean (2 years)	Average Cost in Rs./ structure
T ₁ - Brush wood	3.725	1.21	2.463	144.00
T ₂ - Loose Boulder	3.905	1.13	2.515	80.00
T ₃ - Control	3.615	0.86	2.236	--
Mean	3.748	1.059	2.404	--
Sum+	0.158	0.033	0.083	
CD (P=0.05)	NS	0.102	NS	

Table 2: Silt deposited in different treatments during 2001 & 2002.

Treatments	Silt load in volume (m ³)			Silt load in weight (ton)		
	2001-02	2002-03	Mean	2001-02	2002-03	Mean
T ₁ - Brush wood	0.0017	0.028	0.015	0.0024	0.04	0.021
T ₂ - Loose boulder	0.0018	0.075	0.038	0.0026	0.108	0.055
T ₃ - Control	Nil	Nil	Nil	Nil	Nil	Nil

Table 3: Extent of area damaged in the downstream field due to siltation in different treatments.

Treatments	Average area, m ²
T ₁ - Brush wood	0.30
T ₂ - Loose boulder	0.12
T ₃ - Control	1.392



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