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Interactive comment on "Experimental study using coir geotextiles in watershed management" *by* S. Vishnudas et al.

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Explanation to comments from Referee #3

1. India is the largest country (66% of the world production) producing coir fibre, of which Kerala account for two-thirds of the production. According to FAO, out of the total annual global production of coconuts, only 10% of the coconut husk is being used for fibre extraction which is estimated to be around 500 Gt / year of coir. Out of this only about 30% enters the world trade. Goshal and Som (1993), cited in: Kaniraj and Rao (1994) have presented an economical evaluation of the use of geotextiles from the Indian perspective. They compared the costs with synthetic geotextiles and conventional methods for typical geotechnical problems in four metropolitan cities of India. Even at the present high costs of geotextiles, the solutions using geotextiles have been shown to be economical in certain situations when factors such as land

costs, material costs and maintenance costs are taken into account.

The aim of this experiment was to study the effectiveness of coir geotextiles (natural fibre) for slope protection and to provide an alternative, cost effective option to reduce soil erosion, increase vegetation growth and increase soil moisture availability. If the efficacy of coir is proved, it can be used to strengthen watershed structures, thereby offering an attractive alternative for the expensive conventional methods. Although the processing of coir geotextile is labour intensive, this will provide a livelihood and an important source of food security for many farmers in Kerala, India.

2. Some relevant case studies for this study are given below. These publications report on successful case studies in the application of coir geotextiles in river management.

Cammack (1988) reported the use of coir geotextiles in Noora basin in Australia, for causeway protection to prevent wave-lap erosion in saline water condition. He also reported the successful case study of Gooburrum main Canal bank protection using coir geotextiles.

Sotir and Simms (1991) illustrated case studies of river bank stabilisation using coir geotextiles in USA. In Longfellow Creek Bypass Channel, Coir geotexiles with selected plants were used to stabilise trapezoidal channel slopes. Results show that use of coir geotextiles in and along streams and river bank protection, and for the establishment of healthy riparian zones for aquatic enhancement appears to be a viable alternative.

White (1991) reported various control techniques adopted by Illinois department of conservation for the control of stream bank erosion of the Crow Creek. He reveals that coir geotextiles were found to be the most effective and environmentally sound biotechnical application to effectively enhance our environment.

Schurholz (1992) illustrated various field trials using coir geotextiles in Germany. It includes stabilisation of a creek bed and its bank using woven geotextiles, river bank stabilisation and revegetation of shore lines by sedimentation.

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A field study conducted by Sudhakaran (1994) showed that coir geotextiles are effective in riverbank protection and also that it is economical in its use with 50% reduction in cost compared to the conventional gravel lining process.

Lee (2001) through his case studies reveals that coir geotextiles and coco logs were widely used for river training works in Korea.

Anil (2004) through his case study using coco logs reveals that coco logs are effective in preventing meandering of rivers and to prevent failure of river banks. Coco-logs were anchored inside planks and placed at 135o to the flow in the river.

3. Intensity of plants per m2 was identified from June 04 to Feb 05. Among the grasses Axonopus compressus and Heteropogon contortus alone survived. Maximum intensity was found to be of Axonopus compressus.

Since the experiment was conducted and monitored from the view point of the user community they developed indicators and evaluated, monitored and gave the results. The triangulation was carried out by scientists.

4. Length of grass referred to as height of vegetation. The average length of the sampled leaves, at any period, is assumed to be indicative of the vegetation growth at that period.

5.. An experiment was conducted in the Soil Conservation Research station, Kerala, India to evaluate the different types of coir geotextiles and polythene as soil mulch. The treatments include different mulching materials viz. natural needled felt, black needled felt, rubberized coir, black polythene and transparent polythene along with a control (no mulch). The test crop used was bhindi (var. Salkeerthi). Results of the study revealed that growth parameters of bhindi such as plant height, leaf number and lateral spread were increased by mulching with rubberized coir and transparent polythene. These two mulches caused earliness in flowering and increased fruit yield. Coir materials as mulch registered a yield increase ranging from 67 to 196%. Observations also re-

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vealed that weeds were not noticed in plots mulched with black polythene, transparent polythene and rubberized coir (Anil, 2004).

As the aim of the experiment was to study the effectiveness of coir geotextile in embankment protection, comparative studies with other materials were not carried out in this study.

6. Kindly also see the explanation to the first referee comments.

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