C-36: Design of flexible pavements of C & D Class and village type roads in Sri Lanka using paddy-husk-ash and hydrated lime

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The maintenance costs of stablised roads are negligible when compared with traditional metalled base roads. The annual maintenance cost of 16,800 km of C and D class roads in 1996 was Rs.245,000,000. This could have been reduced substantially if stabilised road pavements were adopted.

Soil stabilisation is the process by which natural soils are improved by mixing locally available cheap materials such as lime, paddy-husk-ash etc. for use as substitute for aggregate base construction. Vast improvement can also result

from adding small quantities of lime but the strength will diminish in about 4 to 5 years. The durability and life time of a base construction can be enhanced by adding paddy-husk-ash which contains cementitious materials which bind the soil and lime particles together. The most economical proportion of lime to paddy-husk-ash is 1:2. Suitable paddy-husk-ash in amorphous form can be obtained by burning paddy husk in incinerators at temperatures between 600°C to 650°C.

A study was conducted to find the suitability of paddy-husk-ash in stabilising a road base and the cost effectiveness of the construction. A selected soil was tested with and without stabilising additives and the results compared. The tested soil samples showed an increase of C.B.R. value from 6 to 20 after stabilising with 6% of lime and 12% of paddy husk ash.

A cost estimate has been carried out for D class read designed in 2 alternatives, one with and the other without paddy-husk-ash and lime. The calculated construction cost for the stabilised soil base was found to be approximately 28% lower than the metal base. This gain is even more significant as the maintenance cost of stabilised base is negligible unlike the metal base. Additionally this will generate employment for surplus labour and maximise the use of local materials. It is suggested to introduce lime-paddy-husk-ash soil stabilisation as a meaningful strategy to cut down the cost for future construction and subsequent maintenance.