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Scarcity of river sand and common alternatives in a Sri Lankan context with reference to cost justification

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Scarcity is created where the infinite human needs and wants are rapidly ameliorated, in a world of finite resources. The construction industry is one of the higher levels of natural resource consumption industries. This research focused on sand, as a scarce natural resource which is used in the construction industry in a Sri Lankan context. River sand is the most popular sand type in Sri Lanka than other types of sand for construction purposes. However, alternatives for river sand has become a necessity due to boundless river sand mining which in turn leads to adverse environmental and social problems. Dune sand, off-shore sand, quarry dust and pit sand were identified as recommendable alternatives based on the experiments jointly conducted by the NBRO and the University of Moratuwa. But dune sand mining has been prohibited by GSMB, and therefore, other three alternatives were forwarded to further tests on this research.

The main objective of this investigation was to make an overall cost justification with regard to the three above alternatives and river sand. The overall costs were classified into two as Cost of Externality and Capital Cost of each material. To determine the external costs of materials, the Delphi method was used. Through the Delphi method, it was possible to determine comparative figures for each material as their costs of externalities. According to the Delphi result, river sand is the most expensive while the other three have the least amount of negative effects to the environment.

Table: cost of river sand and alternative sands

Type of Sand	Capital Cost (Rs./cube)	Cost of Externality index.
River Sand	5800/=	5.45
Off-shore Sand	3900/=	4.30
Quarry Dust Sand	3900/=	4.35
Pit Sand	5000/=	4.56

The capital costs of materials were briefly identified by using their market values. Even in terms of capital cost, the river sand was the most expensive. Therefore, it is obvious that, the time has come to reduce river sand usage while fulfilling the sand demand with other available alternatives, in order to reduce both external cost and capital cost of sand usage.
Key words: Scarcity of Sand, Alternatives, Cost of Externality, Capital Cost, Delphi Method

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