Article information

Article title

Dataset of Particle Size Distribution of Fine Aggregate sourced from Goain River (Bangladesh) and Dawki River (India) as utilized in a Batch Mixing Plant

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Keywords

Fine Aggregate visualization; Sieve analysis; River-sourced aggregates; Fine Aggregate quality; Aggregate suitability evaluation; Goain River- Bangladesh; Dawki River-India

Abstract

This data paper presents the Fine Aggregate (FA) Profile of an important river, the Goain in Bangladesh and the Dawki called in the part of India, which is a major source of natural FA for construction activities in Bangladesh. The FA Profiles were analyzed using sieve and Sand Equivalent (SE) Value of Soils and FA tests over a period of more than two years, with samples collected thrice a month from Jaflong, Sylhet, Bangladesh. The

sampling method followed standard guidelines, and the sieve analysis test report satisfied size distribution requirements, despite some fluctuations in the test results. The primary focus of this data is to present the scenario of sand availability throughout the years, which will be valuable for researchers, engineers, policymakers, and stakeholders involved in planning and designing construction projects that involve river sand. This data paper provides a comprehensive dataset on the FA Profile of the Goain (Dawki) River, which can be reused in various ways, including developing predictive models, monitoring the effects of climate change, and identifying areas for sustainable sand extraction.

Specifications table

Subject	Construction Materials
Specific subject area	Particle size distribution of Fine Aggregate.
Type of data	Table Figure Graph Chart
How the data were acquired	The Fine Aggregate Profile data presented in this data paper were directly collected from the two rivers. The instruments used for data acquisition were a sieve shaker, a set of sieves, and a graduated cylinder, dispersion agent. The data were collected by following American Society for Testing Materials (ASTM) guidelines and the sampling location was chosen to represent the typical sand composition of the river. Different machine learning techniques and Microsoft office package were used to process the data.
Data format	Raw Analyzed

Description of data collection	Fine Aggregate samples were collected from the source, Goain (Dawki) River, thrice a month for over two years. The samples were collected from a chosen location that represents the typical sand composition of the river, most of the sand extract from the river adjacent to that point. The data collection followed the standard guidelines.
Data source location	• Institution: Not applicable • City/Town/Region: Jaflong, Sylhet • Country: Bangladesh • Latitude and longitude (and GPS coordinates, if possible) for collected samples/data: 25.0405° N, 92.2687° E (GPS coordinates: 25°02'25.8"N 92°16'07.3"E) • Google Maps link: https://goo.gl/maps/Fi8Gzq6ppn4SWATm9
Data accessibility	Data is included with this article

Value of the data

- Provides critical information about the physical properties of natural FA for construction activities.
- Can aid in construction planning and scheduling for consistent and high-quality sand supply over the years.
- Offers insights into seasonal variations of sand characteristics over a two-year period.
- A baseline for future studies investigating changes in Fine Aggregate Profile and exploring relationships.

Objective

The main objective of this article is to offer significant information that can benefit researchers, engineers, policymakers, and stakeholders who are engaged in designing and planning

construction projects that require river sand especially in Bangladesh a fast growing infrastructure perspective. Fine aggregate's physical properties are critical in the construction industry, particularly in concrete production, where the percentage of finer particles can significantly affect the concrete's setting time and strength. Therefore, the purpose of this data paper is to present comprehensive details about the Fine Aggregate Profile of the Goain River, which is a crucial source of natural fine aggregate for construction activities in the locality. Moreover, this data can serve as a valuable resource for future researchers to explore further including but not limited to seasonal variation and appropriate period of Fine Aggregate collection based on requirement.

Data description

The dataset used in this research consists of Fine Aggregate Profile data. Samples are taken in a proper manner that allows a comprehensive representation of the variations in the data. To assess the particle size distribution and quality of the sand, sieve analysis and Sand Equivalent (SE) value tests were conducted with a view to obtain Fineness Modulus (FM) and SE value.

FM refers to a numerical index used to describe the fineness or coarseness of a fine aggregate such as sand. The FM is calculated by adding the cumulative percentages of the aggregate retained on each of the standard sieves (usually 4.75mm, 2.36mm, 1.18mm, 600µm, 300µm, 150µm) and dividing the sum by 100. It is unitless.

$$\text{Fineness Modulus (FM)} = \frac{\sum \text{Cu.\% Retained in standard sieves}}{100} \quad (1)$$

The SE test is a standardized procedure used to determine the relative proportions of detrimental fine dust or clay-like materials present in a sand sample. The test evaluates the cleanliness and purity of the sand by measuring the ratio of the height of sand to the height of clay-like materials in a graduated cylinder and the measuring unit is %. The result is expressed as a SE value, usually ranging from 0 to 100, with higher values indicating cleaner and more desirable sand.

$$\text{Sand Equivalent (SE), \%} = SE = 100 \times \frac{Sand\ Reading}{Clay\ Reading} \quad (2)$$