Abstract

Quarries are scattered all around the village of Aarsal constituting a major component in the livelihood of the residents. This project constitutes a final year project aiming at assessing the effect of quarries on the livelihood of the village and its people. The project addresses the general planning of the village quarries by developing a master plan of the current and future situation related to economical, health, and social issues. This project will also look at waste materials resulting from quarries, and, upon the demand of the municipality, hopefully propose solutions for their re-use.

Area Mapping

Based on the general assessment of the village, a GIS map has been established showing the various quarry locations and rough estimations of their corresponding areas. The Municipality of Aarsal promised to deliver all related documents and required information regarding this project to the coordinator of IBSAR. Plotting quarries in Aarsal on a GIS map was an important milestone that the team has accomplished in this project. The quarry distribution map will help in presenting a clear image of the quarry activities taking place with an insight on the environmental effects on the urban settlements of the region.

As shown in the map, the rapid spread of quarrying activities is focused on the Eastern mountainous terrains of the region; this lack of organization is due to the fact that most of the quarries operate without official license from the Lebanese government.

3. Lab Testing

Sieve Analysis

Plotting ‘sieve opening vs. % finer’ according to the lab results implied that the different samples collected are classified under the open and narrow gradations categories. This is a proof of the poor crushing techniques previously witnessed in Aarsal.

To obtain a better more efficient gradation:
- Use of more advanced excavation tools
- Separating the end product rocks according to size distribution.
- Expand the sale market

Strength and Flexure

4. Production Management

5. Benefits

The environmental benefits include:
- Reduction of quarry limestone powder
- Reduction of calcite wastes
- Locating expired quarry locations for Reforestation

The economic benefits:
- Implementation of new by-products from quarry wastes
- Increase productivity given new quarry extraction methods
- Create additional job vacancies

The industrial benefits:
- Use of quarry wastes in pavement construction
- Utilization of high volumes of limestone quarry wastes in concrete industry
- The use of quarry dust for self-compacting concrete applications