

ECONOMICAL AND ECOLOGICAL PROBLEMS OF PLACING MINERAL BUILDING MATERIALS IN AZERBAIJAN

AZERBAYCAN'DA MÎNERAL ÎNŞAAT MALZEMELERİNİN YERLEŞMESİNİN İKTİSADİ VE EKOLOJİK SORUNLARI

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ÖZET

Azerbaycan'da çimento, kireç, alçıtaşı (jips), mermer ve diğler mineral inşaat malzemeleri üretim yerlerinin belirlenmesindeki bazı iktisadi ve ekolojik sorunlara dikkat ediliyor. İnşaat malzemeleri üretmek için mineral hammaddelerin ve eldeki sanayi atıklarının rezervi gösterilmiştir. Plastik kütlelerin inşaat işlerinde kullanması imkanları tartışılıyor.

ABSTRACT

Some economical and ecological problems of plasing plants for the manufacture of cement, lime, gypsum, marble and other mineral building materials on the territory of the Azerbaijan Republic are considered. The information on the reserves of mineral raw materials and production wastes for the manufacture of building materials is presented. The possibility of use plastics in the construction works is discussed.

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1. INTRODUCTION

The territory of the Azerbaijan Republic is rich in mineral building materials such as sand, gravel, gravel sandstone materials, limestones, brick-tile clays, gazhies, marble, porphyries, granodiorites, tuf, bentonite clays, mineral paints, facing stones, rubbles, trass, pigments and etc.

The extend of utilization of these materials' reserves in the construction works in the Republic is being at different stages now.

The paper presents the results of the analysis of some economic and ecological aspects of placing mineral building materials on the territory of the Republic.

1. CEMENT

The Karadağ plant being a unique cement plant in the Republic is situated in Apsheron economic region, occupying nearly 7 per cent of the territory of the Republic and where 30 per cent of the population, nearly 60 per cent of the manufacturing enterprises, 65 per cent of the building material industry and 50 per cent of the civil engineering erection works of the Azerbaijan Republic are concentrated (Salahov M., 1985) . The plant with the capacity not exceeding 1.3-1.4 Mt. per year is not able to meet needs of the Republic in cement. For example, at a demand for 340 kg of cement per capita in the Republic only 180-200 kg is being produced. Nearly 40-45 per cent is necessary to deliver from another countries, the fact that is connected with large transportation costs.

These are the following ways which are considered to meet needs of the Republic in cement:

1. The increase of the cement production capacity. This can be realized by the development of new qualitative raw material resources in Apsheron region with a view of the further extention of the production capacity of Karadağ cement plant and the construction of new plants. The raw material reserves of more than 100 Mt. for the manufacture of cement are concentrated near Agdam. But the construction of new plant should be realized in line with the development and adoption of additional measures capable to organize the production with minimum or without wastes due to the fact that Agdam is the health resort zone of the Republic.

There are also the reserves of raw materials for the construction of the new plant for the manufacture of decorative cement in Taus. The raw

material reserves for the cement plant are also exist in Kelbadjar economic region.

2. The upgrading of cement quality will in the end minimize its consumption in the construction works. If today the Karadağ plant produces cement of grade 400, there is a possibility to obtain cement of grades 300-1200 by using metallurgical slags and alkali metal compounds (Salahov M., 1988). In cement production the use of the superplasticizer is of special importance because it increases the strength of the manufactured products by 50 per cent. At the same time this promotes the intensification of the clinker milling process by 40 per cent. In a whole the use of the superplasticizers in cement production gives 10-15 per cent economy.

The wastes of quarries can be used as raw material resources for the Karadağ cement plant, their quantity amounting to 2 Mm³ per year, 40 per cent being formed in Karadağ region. The other wastes which could be used for the cement production are the wastes of the Sumgait Tube Rolling plant. More than two million tons of open hearth slag occupying tens of hectare of suitable lands has been accumulated.

Some economic problems of cement production at the Karadağ plant were considered. Today nearly 30000 t. of inorganic dust and harmful organic fuel burnt gases as oxides of nitrogen, carbon, sulphur, benzopyren as well as hydrocarbons are thrown into the air by the plant chimneys. The cement production is one of the most energy consuming branch of industry. In clinker cost price the fuel costs constitute 40 per cent. To minimize the fuel consumption norms depending on the technological progress in this branch of industry it is necessary to use high-powered and economic, from the heat technology point of view, kilns and begin manufacturing cement using dry process. When converting the plant to dry process of production the consumption of equivalent fuel decreases by more than 25 per cent and the volume of waste gases will 35-40 per cent decrease as compared with the wet process (Mustafayev. 1,1991). By using dry process we solve the other ecological problem. We can save up to 1 Mt. of fresh water per 1 mill. t. of cement.

2. LIME, GYPSUM AND OTHER CEMENTING MATERIALS

The overwhelming share of production of lime and other cementing materials (nearly 67 per cent) is also concentrated in Apsheron region and is poorly mechanized and primitive. This branch of production is very primitive in Republic. Therefore the production cost is 27 per cent higher than the cost of manufactured cement. There are huge reserves of raw

materials for the production of lime in Sheky, Apsheron and other western regions of the Republic. But for lack of the effective technology it is impossible to intensify their production on small-and average-range enterprises. At the same time the low grade cement can be substituted by lime. There is a necessity for the construction of workshops for manufacturing cementing materials on the basis of eruptive rocks of unslaked lime and gypsum with capacity of 100 Tt. per year in Nakhichevan, Gyanja, Kazan and Kelbadjar. It is possible to produce 1 Mt. of unburnt cementing material by 2005.

The confirmed reserves (35 Mt.) of gypsum are concentrated in 50 km from the south-west of Geran station. Besides gypsum the reserve contains anhydrides used in the manufacture of covering materials for the housing interiors.

Gazha as a locally procurable cementing material was widely used instead of cement in laying walls. Gazha reserves are spread mainly in the western regions of the Republic. But the domestic method of production doesn't allow its wide application in the local construction works.

3. WALL BUILDING MATERIALS

More than 45 per cent of the production in the Republic cube stone is manufactured by the Karadağ plant. This plant is the most powerful in Europe in this branch of industry. The cube stone is the cheapest in the partem of building materials. For example, the product cost of 1 m^3 of the manufactured cube stone is 2.5-3 times lower than the cost of brick and nearly 7 times lower than the cost of the reinforced concrete wall slab. But there are some facts confirming the economic expediency of the production use of bricks in regions where the reserves of lime and effective aggregates are lacking.

4. NON-ORE BUILDING MATERIALS

Nearly 23 Mm^3 of non-ore materials (sand, gravel, rock-stone, quarrystone and etc.) are used in the construction works in the Republic yearly. Inexhaustible reserves of non-ore materials are concentrated in Bahramtepy, Mingechaur, Velvelchay, Ordubad, Dashburun, Lencoran and other regions of the Republic. At the same time nearly 40 per cent of concrete production is concentrated in Apsheron region. Therefore the non-ore building materials are supplied to Apsheron from the remote regions of the Republic. But there exist possibilities for the production of artificial non-ore materials (ex. keramzit). For the manufacture of light and

stable concretes it is possible to use new technology of production of the aggregate "azerit" on the basis of any kind of raw material and the corresponding waste. There is a potential possibility for the power of the working enterprises being increased simultaneously with the construction of new plants for the production of gravel and sand in Akstafa (reserves more than 18 Mm³), Zakataly (more than 20 Mm³) and Gusary (more than 20 Mm³) regions.

From the economic and ecological points of view of great importance is the use of production wastes and reserves for the manufacture of non-ore building materials. The most perspective for use in the construction works are the following production wastes and reserves:

- Lypharith reserves (Khanlar, Slamkyr, Dashkesan regions) and ash (Taus, Kazah, Kubatly and other regions) for the manufacture of light concrete.

- Wastes of the Azerbaijan Concentrating Mill (20-25 Mt. total, 1.8-2 Mt. per year) which can be used for the manufacture of non-ore materials for the high-way engineering.

- Refinery wastes (18-20 Mt. total, 80-85 Tt. yearly) for the manufacture of light aggregates.

- Wastes of the Gyanja Aluminium Works (10 Mt. total, 0.5 Mt. yearly) can be used for the manufacture of light aggregates, sanitary engineering products and so on. The rational use of these wastes must give positive effects from the point of view of ecology and economy allowing to save both raw and building materials.

5. FACING MATERIALS

In the Republic there exist reserves of marble and travertine. In Dashkesan marble quarry there are produced marble blocks, slabs and crumb as well as raw material for the Baku facing material plant. The product cost of marble slabs, manufactured at Baku plant is 25-30 per cent lower than that of the slabs manufactured at the neighbouring Gyanja plant. For a long period a substantial volume of the manufactured marble has been used outside the Republic.

Thus/in Azerbaijan there exist considerable reserves of mineral building materials. But for lack of the progressive technology in the Republic the building material industry both in volume and quality of the manufactured products is not able to provide the necessary rate of the construction development. The chemical, and petrochemical branches of industry can play a significant role in improving the industrialization of the building material production in the Republic. There exist possibilities

of widening the nomenclature of production synthetic building materials on the basis of plastics and resins. These are slabs, elastic and hard sheets, varnishes, cementing materials, glues, flooring materials and various building structural elements (Salahov M, 1991).

Using modern technology of production of mineral building materials and plastics it is necessary to meet demands of the Republic by the exploitation of its own reserves. Moreover, it should be taken into account that the ecological safety must be the most prominent feature of these technologies. This is connected with the fact that the greater part of mineral building material reserves is concentrated either in densely populated or in the health resort regions of the Republic.

For this purpose it is necessary to put forward the problem on the development and placing of small-and average-size enterprises and building materials for the stable provision of the Republic with local building materials and the environmental protection.

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