

**3 rd International Conference on Ecological Protection of the Planet Earth,
10-11 June 2005, İstanbul**

Land Filling Of Waste: Trabzon City Case

Dilek Şen Beyazlı*, Şinasi Aydemir, Karadeniz Technical University, Trabzon**

Abstract

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Since 1980 second part of land filled has been going on. Just in front of the market place (Moloz) land filling of residential wastes started. Filling the sea by household wastes progress from the shore to the sea step by step. Nowadays, almost 93.894 m² in filled land was gained, which equals 469.000 m³ landfill of waste.

Daily waste production is 200-250 ton/day from the city, 800 ton/month waste from 16 local surrounding authorities, 25 ton/ month from central villages in the extension area of Trabzon authority.

However, there is an initiative to build a waste treatment plant for household wastes of cities of Trabzon and Rize and surrounding towns of them. Those local authorities set up an organization to finance the cost of the plant. There are also attempts to negotiate for funds the projects with the European Union funds.

On the other hand, land filling of waste has been continuing on the existing waste area, so there is need for a temporary dumping site.

The above local authorities almost agreed on a site in between Rize and Trabzon (near Kutlular villigage). However, the construction of the treatment plant will take time.

Besides residential waste, rubble filling has been also continuing along the shore approximately 30-50 m. wide and five km. length from the 1970s shoreline.

The filled area between 1980- 2002 was designated for recreational use as such small sport fields, restaurants and walking paths and for some official uses.

In this paper we'll discuss the consequences of land filling of waste under the following headings.

- *Health impacts (caring of infections diseases by sea gulls)*
- *Visual and Environmental Impact*
- *Lack of integration with development plan*
- *Re-use of filled land*
- *Dumping techniques*

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- selected plants should have ability to thrive on low-nutrient soil with minimum nutrient addition
- plantation should be made in sufficient density to minimize soil erosion.

As will be shown in the course of paper, in filling in Trabzon is not fully consistent with the above criteria.

The case of Trabzon City: Growth and the development

Trabzon is a sea side city stretching east to west almost over 20 km; the physical form is linear, parallel to the coast line. Topography is steep towards south.

The population of Trabzon has increased from 50000 in 1960 to 240000 in 2000, and spatially extended (Figure 1).

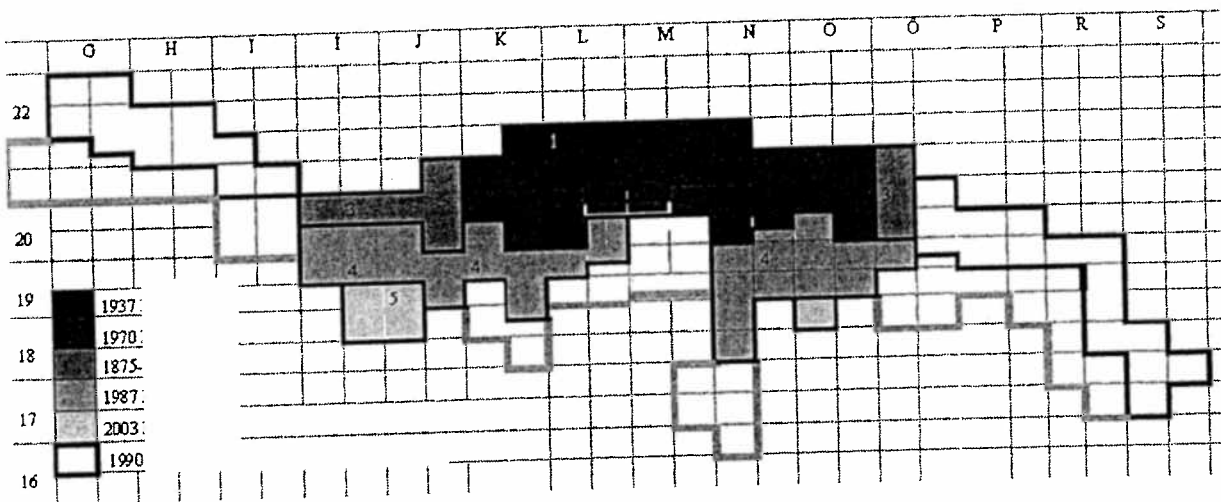


Figure 1. Spatial growth stages of Trabzon (Aydemir, 2005)

Urban economy mainly depends on commerce and trade, higher education services, health sector.

Fishery and agriculture are important for urban economy, too. Fishing products are exported to domestic markets. Agriculture is dependant on hazel nut and tobacco and tea growing. However, tobacco growing is losing it's importance. Hazel nut products are also marketed to domestic markets and to EU countries as raw material of chocalete industry.

Manufacturing industry is located at the organised industrial zone in the east of the city, serving for Trabzon and for a wide hinterland. In the organised industrial zone, there are 8 papers and printing, 6 glass, 3 textile and clothing, 14 machinery, 2 metallic goods, 10 wood, 12 food, 12 plastic and other firms mainly producing household goods such as furniture, heating appliences, news paper printing, packed foods like biscuit and crackers, packing materials have been producing for local and domestic markets, but some are exported too.

There are three small scale industrial sites that serve as service industry for households, for car owners and construction sectors.



Figure 9. Waste dumping in front of whole sale fish market



Figure 10. A view from waste in fill site showing waste composition, waste picking

Classification of Wastes

Wastes are, generally, classified as follows:

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Purification plants wastes: produced from water and waste water and sewage process (URL 3; 5).

Waste Components

The components of municipal waste are mainly influenced by the geographic conditions, living habits, standards and domestic fuel structure. While the municipal waste quantity is increasing rapidly, the components in the waste are also changing. The organic and easy-burning materials are also increasing. There is obvious distinction between the waste in large cities and small/medium ones. The organic compounds in the domestic waste in large cities account the most of the waste. Waste characteristics in Trabzon are as follows (Figure 11):

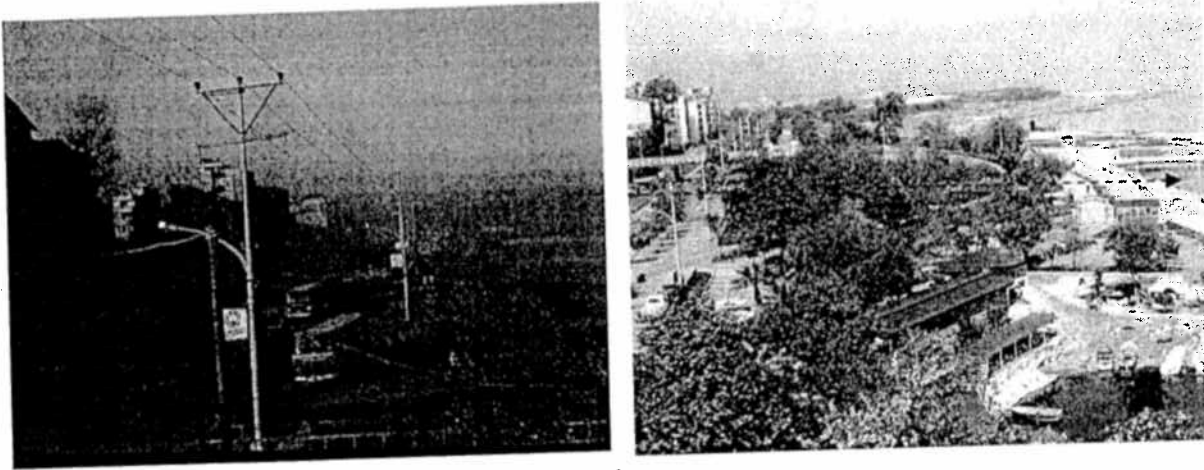


Figure 4. Extension of in fill strip and plantation

In filling of Wastes

For almost 40 years, every kinds of wastes have been collected from houses, commercial premises, small scale industries and health services and transported to a designated site called Moloz, in the middle of the city on the shore. Household wastes, industrial wastes and bio medical wastes are collected separately without any pre treatment.

Daily household waste generated in the city is about 250 ton/day, 800ton/month from neighbouring municipalities, and 25 ton/month from peripheral villages which are collected regularly by municipal authority and transported to the site. Industrial wastes are also collected and transported to the site by their organization (Figure 5, 6, 7), stored, piled and dumped on the sea shore (Figure 8)

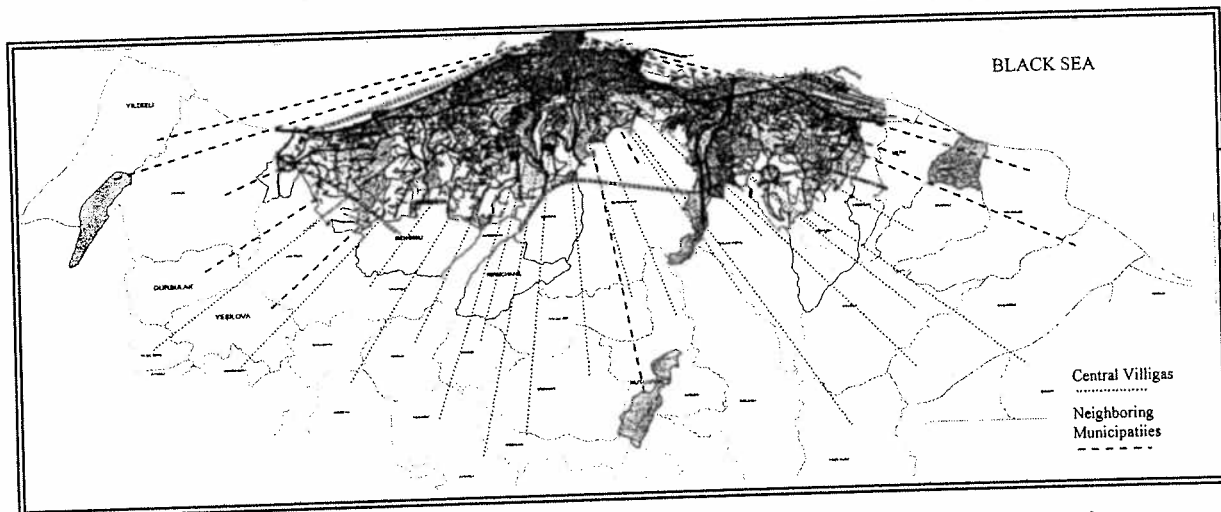


Figure 5. Household waste production and collection sites around and in Trabzon city

Waste Decomposing-Waste Picking and Piling

Most of the wastes are still piled up together in open air. Household wastes are not pre-treated before transferring to the waste filling site. Decomposing has been done by waste pickers who work on the site for 18 years on a contract. Waste pickers decompose and collect reusable and recyclable materials depending on the market demand and market values of the materials regained by decomposing which amounts % 20 of the total wastes. Street sweepers also collect 200 ton/day of wastes

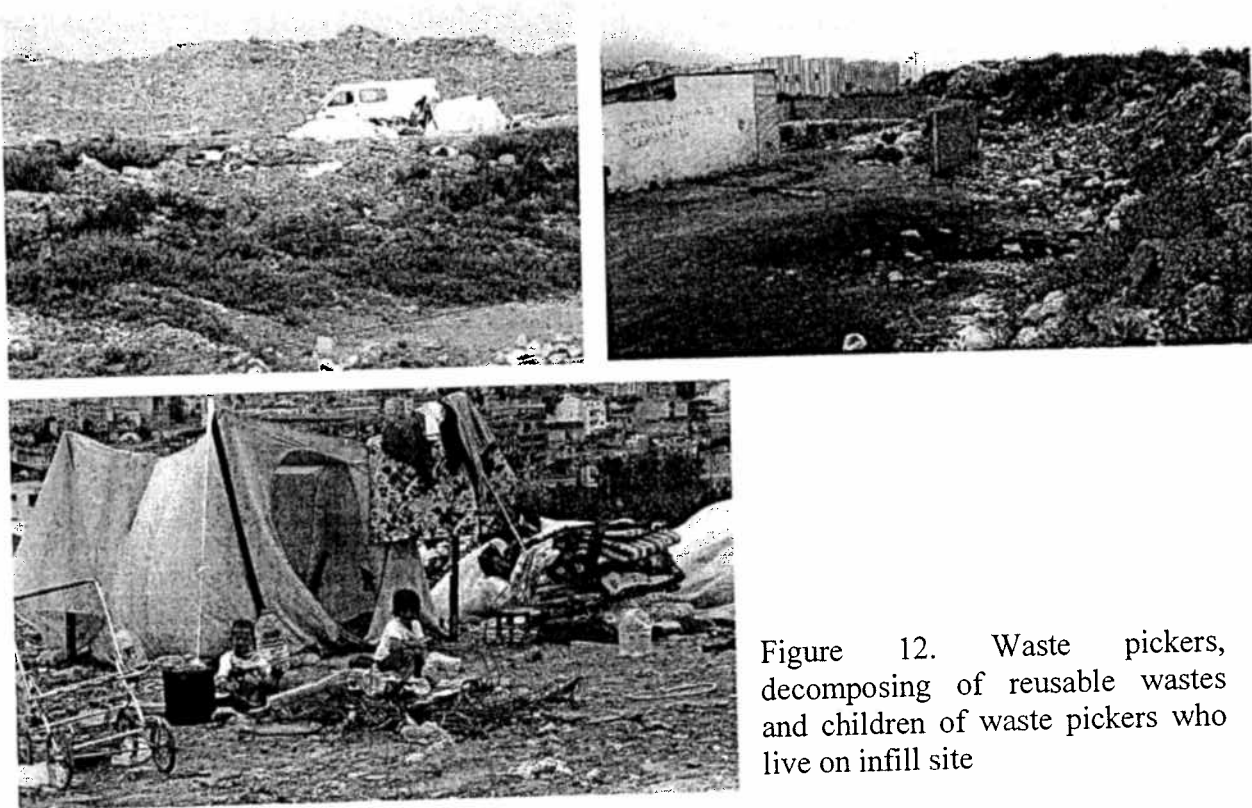


Figure 12. Waste pickers, decomposing of reusable wastes and children of waste pickers who live on infill site

Reuse of Wastes

Reuse of wastes means that to use a product more than once for the same or different purpose. Reuse avoids the more costly re-processing required to recycle a product for another use. Repairing a product, donating or selling a product to another user are examples of reuse. Reusable wastes estimated as 1500tons/year (Infrastruktur& Umwelt- Tempo, 2004; URL 7).

Recycle of Wastes and Obstacles

Recycling refers to practices and technology that recover materials from the waste stream for use of paper and paperboard, magazines, glass, aluminum, plastics, tin cans. Recycling may be limited by unstable markets and prices that fluctuate causing problems for recycling.

Effects on Human Health: Likely Consequences of Waste Infilling

Several environmental effects may occur from piling, dumping and infilling of household wastes and biomedical wastes such as smelly odor, pathogenic microbes, release of ammonia and sulphide, dirtiness, methane leakage, visual pollution, contagious diseases carried by mices, birds, flies and mosquitos and contamination of soil and wate.

A study on the waste infill sites in Trabzon, Giresun and Ordu showed that hering gull's carried a wide range Salmonella, whic are pathogenic to man and domestic animals (Karagüzel.A; Köksal.İ; İ,Baki.A; and et all,1993) (Figure 15).

Smelly odour is a serious matter especially warm days of the summer which has been carried by the prevailing winds towards the city. Waste filling sites are dangereous for human in case of methane gass explosion unless necessary precaution are taken.



Figure 15. Salmonella and Shigella carried by herring gulls (Larus sp):

Reuse of in Filled Sites

670000 m² of area gained by infill, 93834 m² (equals to 469000 m³) of total in filled land used as waste piling and dumping area. The rest of the infilled land was filled with construction residuals and debris. However, the amount of in filled area is stretching to the west of the city.

So far, except the waste filling site, rest of the gained land designated to recreational use, such as mini football courses, restaurants, exhibition hall, and pedestrian walk ways (Figure 16,17,18,19).

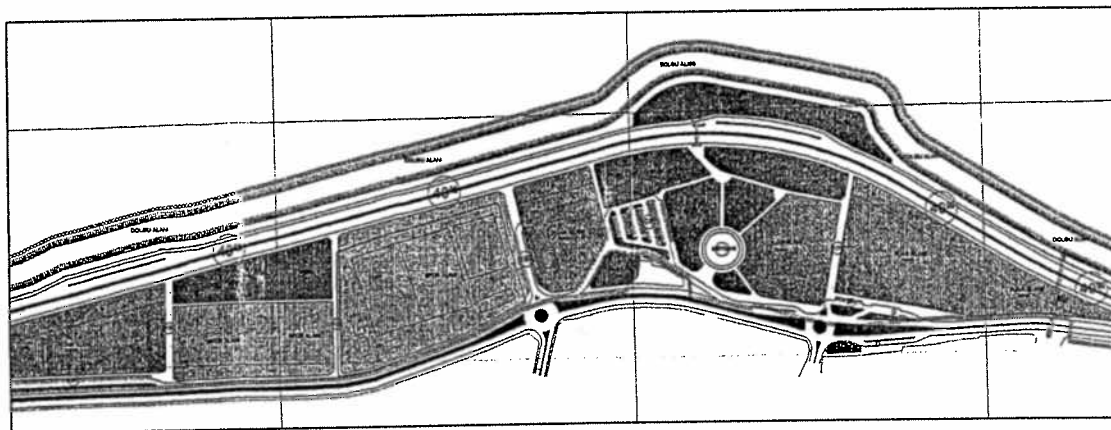


Figure 16. Planning for re use of in filled area

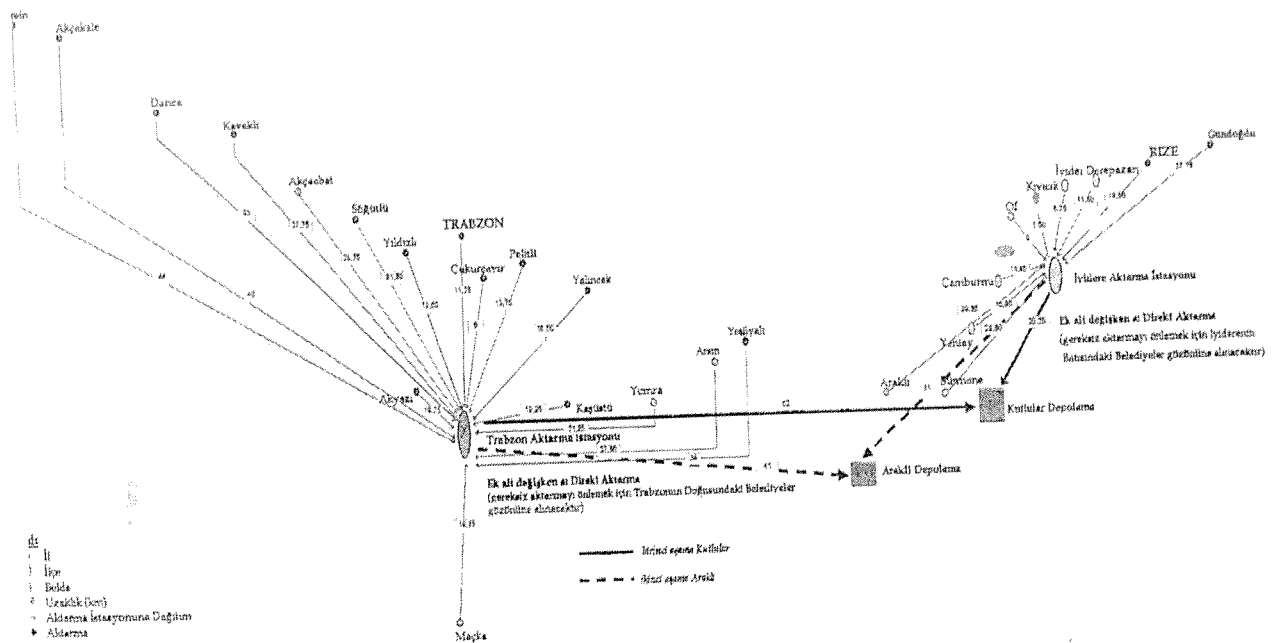


Figure 20. Trabzon- Rize Integrated Waste Treatment Catchment Area (from Municipalities)

In addition to the above initiatives the following policies will also be implemented:

- Minimize the waste from the source of the generation points (at premises)
- Research and develop the disposal technologies facilitating the industrial waste treatment including the promotion of the quality of compost, improve land fill technologies, develop and adopt the appropriate equipment and materials
- Set up technologies and equipment of incineration
- Strengthen the publicity and education, raise the public environmental awareness
- Minimize the waste by encouraging households, consumers and producers to use recyclable packing materials (non plastic materials)
- Use well burning coal for heating at houses, at work places
- To promote households to use grinders fixed kitchen sinks to grind vegetables and fruits residuals instead of collecting them in bins or containers.
- Proper land filling should be implemented with regard to location, design, construction of new land fills and their operation, closure and aftercare phases (URL 8; R. G. 21586).

Unfortunately, waste collecting, decomposing, picking and pilling processes are not in accordance with the criteria mentioned at earlier in the paper.

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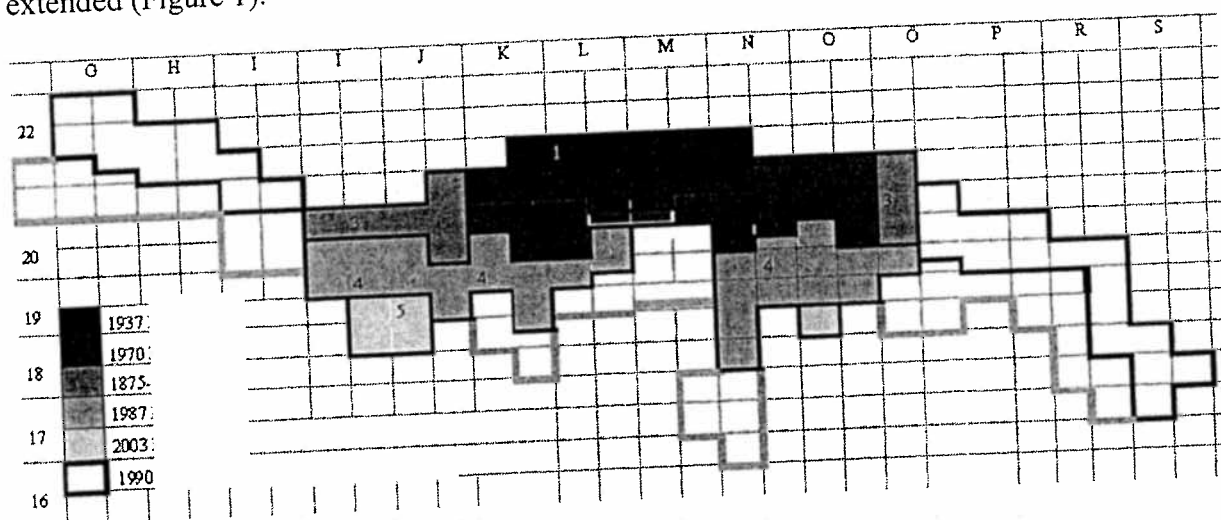


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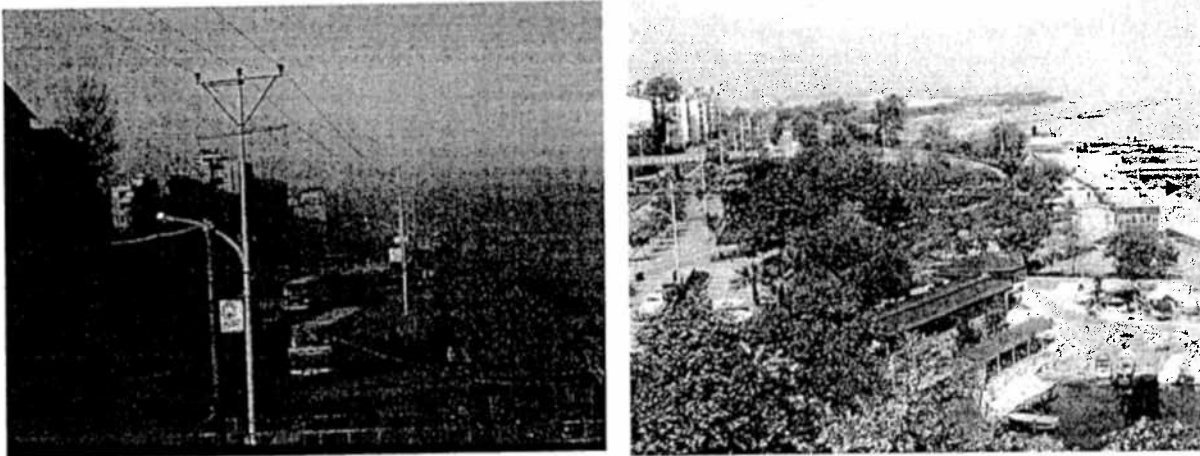


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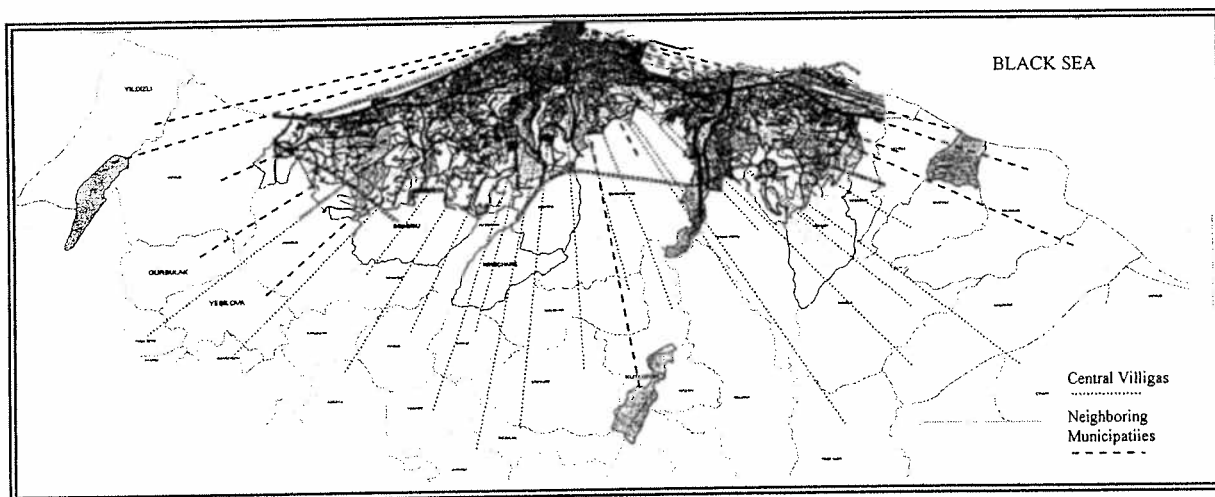


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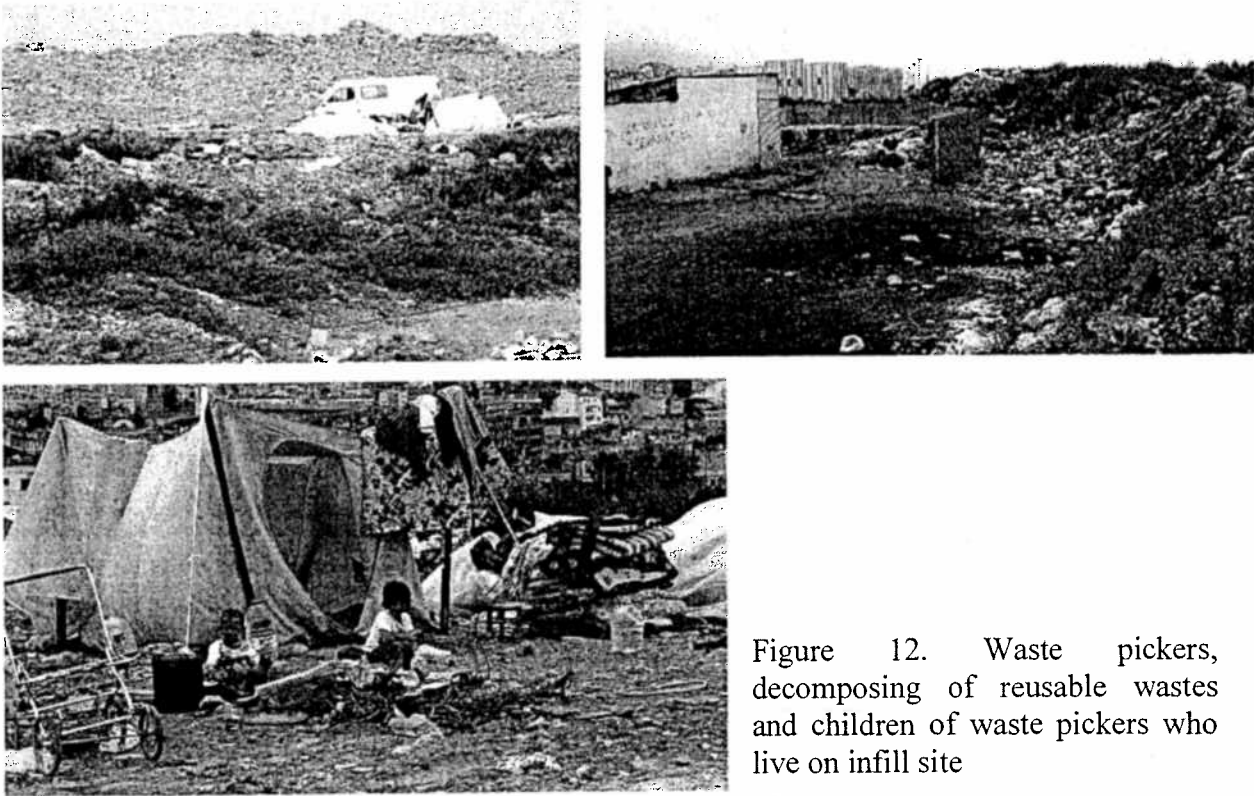


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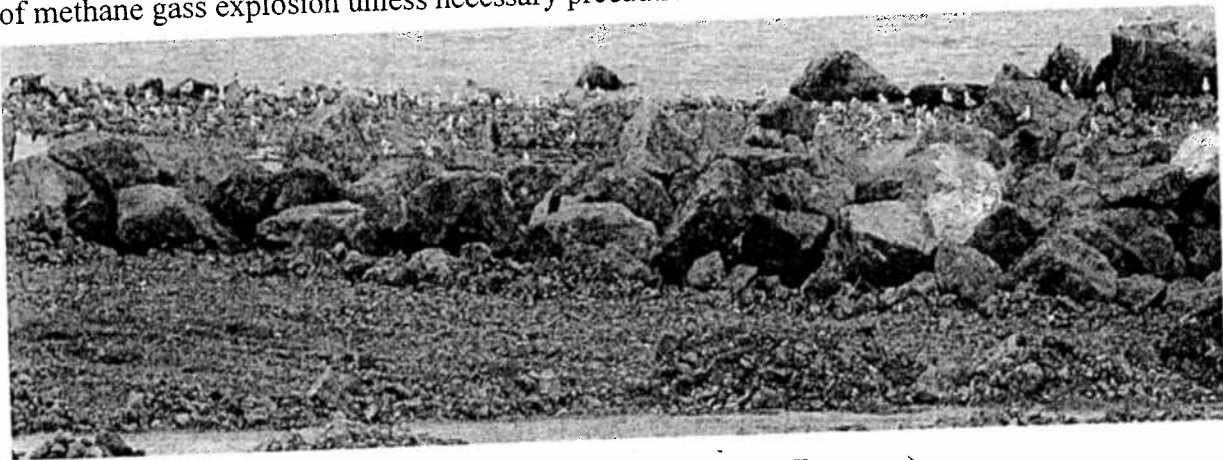


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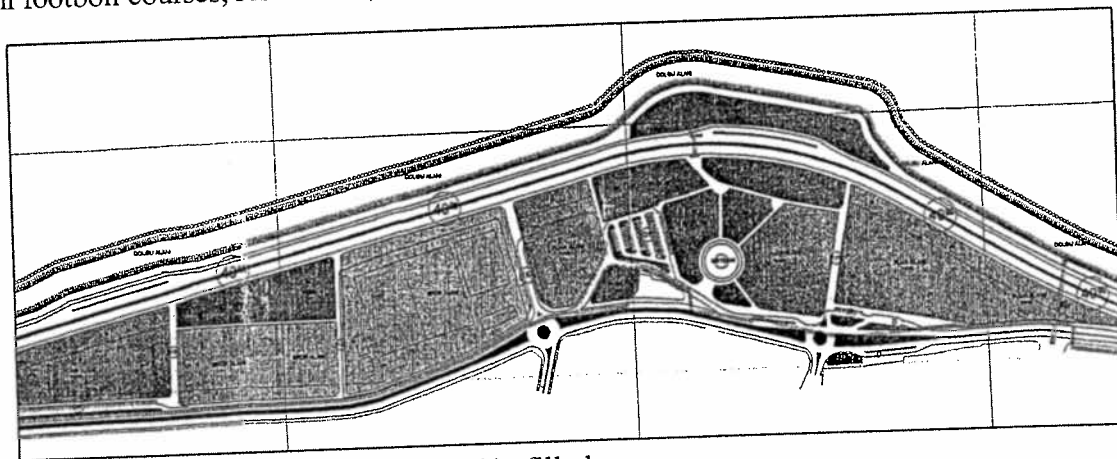


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