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Urban Solid Waste Management System in Primorsky Territory, Russia – New Technologies

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Abstract – The authors of the present paper describe the Solid waste management system which is under construction within the framework of the target program in Primorsky Territory is described. The basic problems are designated and ways of their decision are shown.

I. Introduction

Till 1990 in the USSR there was a system of the account and use of recycling material fulfilled by “GOSSNAB”. It was considered, that use of secondary materials is the powerful factor of resource saving. For rendering the effective scientific - engineering help for resource saving and uses of secondary raw material the State Logistics Committee of the USSR had the specialized Institute of secondary resources.

During transition of Russia to market economy old methods have ceased to work, conditions which would stimulate gathering and use of secondary raw material in new conditions have not been created. The specialized enterprises engaging in processing of secondary materials, became private and in part went on other kinds of activity that has led to sharp reduction of gathering and use of secondary raw materials.

It is known, that the significant role in maintenance of ecological safety is played with the decision of a question of storage, processing and recycling of waste products.

Primorsky Territory is the region of intensive social and economic development. It is of great importance for economic complex and in the system of strategic interests of the Russian Federation. Primorsky Territory provides between continental part of the Far East of Russia with the world market. It has unique diverse of flora and fauna - the total number of rare and endanger species of plants in Primorsky Territory are 207, 54 of it are protected by the Red data book of Russia, the number of rare animals are 458 species, 102 species are endemics [1].

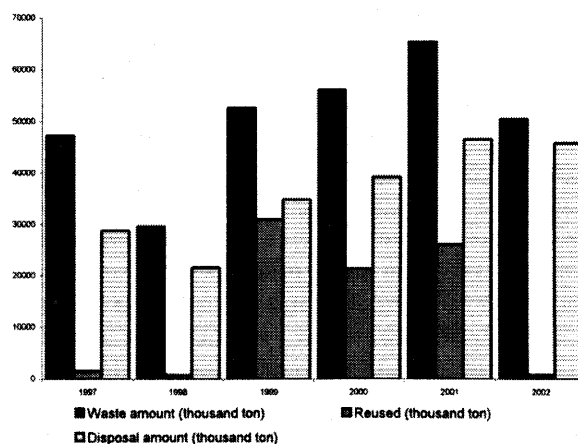


Fig. 1. Dynamics of Solid Waste Quantity per year (1997-2002)

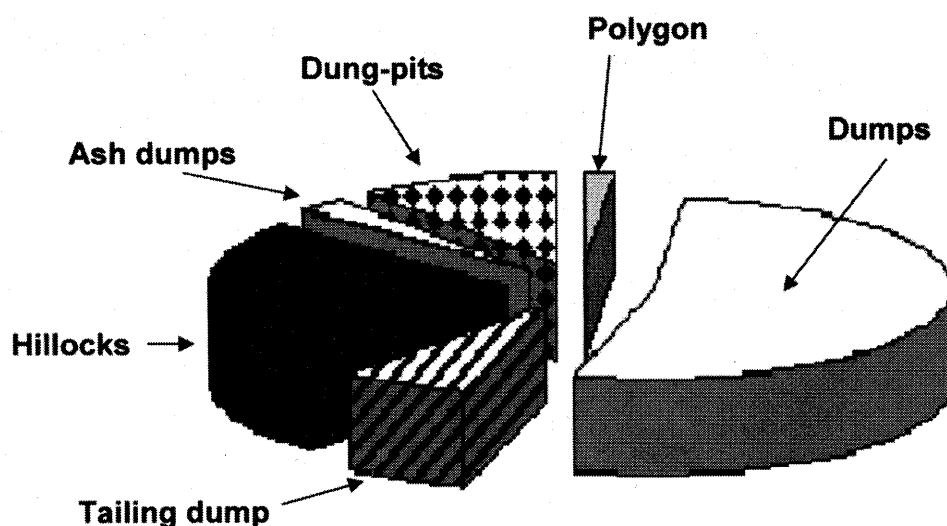


Fig. 2. Solid Waste Disposal's sites Characteristic

At the same time, it is the region of intensive use of nature. In Primorsky Territory it is concentrated about 30% of social and economic potential of the Far East [2]. The basis of economy of Territory is made with key economic branches of the industry: wood and timber processing, mining, electric power industry, coal, fish, food, construction, an agriculture, trade and public catering. The number of industrial enterprises in Primorsky Territory exceeds 42 thousand, they generate significant amount of industrial wastes (50,463 million ton in 2002). More than 2 million people live in Primorsky Territory, and they produce more than 750 thousand ton of municipal waste per year.

The diagram (Fig. 1) shows the dynamics of the waste quantity generated in Primorsky Territory for the period of 1997-2002. It is obvious, that only the insignificant part (not more than 5%) of solid waste generated on the territory of Primorsky Territory is exposed to recycling, but great amount of solid waste products are accumulated at the Territory. The main process of solid waste treatment is burning and only insignificantly small amount of waste products is used as secondary raw material.

Pollution of territory by waste products threatens health of the population and biodiversity [2,3]. Among the basic threats: first on a degree of danger are the solid waste products generated by galvanic manufactures, all kinds of activity with the mineral oil, the mercury containing devices. The main part of pollutants are formed by slag waste products, waste products of mining manufactures, solid municipal and medical waste products [3,4].

For a long time the problem of a waste management legal base is not adjusted, selective waste products collection is not realized. Disposal of waste products is made on the non-equipped sites (fig.2), the control of influence of these waste products for adjacent territories is not made. About 60% of existing sites for neutralization of municipal waste do not meet the requirements of sanitary norms and rules. There is only one enterprise processing significant volumes of waste products - the Vladivostok incinerate factory. The branch of business connected to processing of waste products, is at its early stage of development [4].

High level of chemical and microbiological pollution of ground that results in accumulation of toxic substances in ground and finally creates real threat to health of the population. It proves by true results of the laboratory control. Quality of soils on sanitary - chemical parameters has decreased in 1,5 times, on contamination by heavy metals in 1,2 times.

II. The structure of the program

To settle down the problems of Solid waste the new program has been accepted by administration of Primorsky Territory. The purpose of the Program is the development and realization of a complex of the measures directed to: reduction generation of waste products, involving of waste products in to manufacture as secondary raw material, maintenance of ecologically safe storage and destruction of waste products, carrying out rehabilitation of territories, degraded under accommodation of waste products, liquidation of industrial wastes dangerous for environment.

Achievement of the above purpose provides creation of legal and technological base for realization in Primorsky Territory at all levels of management of a state policy in sphere of the Waste Management; creation of a control system; economy of natural resources due to the maximal involving waste products in recycling process; realization of projects on processing and neutralization of separate kinds of waste products for the decision of a problem of recycling of waste products.

The program consists of the following components: creation of a control system for waste treatment, carrying out of research and development, creation of system of the population awareness raising on waste issues, training of experts in the sphere of waste management, creation of a network of the enterprises on waste processing, construction of landfills for waste and rehabilitation of the polluted territories. Each of this components is the integral part of the long-term actions directed toward achievement of the purposes, mentioned here as basic.

The program implementation:

Will allow to accumulate and effectively use scientific and industrial potential as well as financial opportunities of the territory;

Will provide radical changes of ecological conditions and improvement of conditions of life in Primorsky Territory;

Will become a basis for development of new industrial sector of profitable manufacture of a commodity output on the basis of waste products processing, as sources for secondary raw materials.

Realization of the program is planned in 2003 – 2010 years.

III. The program management

The important part of the program is the diversified management system directed for achievement of peak efficiency from realized actions.

The basic functions for realization of the program are assigned to executive management. The important role in definition of strategy for realization of program actions, maintenance of a high scientific and technological level of the program is played by the Supervisory council, which structure includes leading scientists - ecologists, practical workers, experts of state bodies.

The scientific supervisor of the program is the chairman of the Far Eastern Branch of the Russian Academy of Sciences. Practical realization of actions is carried out through "Promot-hody" regional enterprise ("Primorsky Waste" Company) and the enterprises on waste processing. The program stipulates creation of two skilled - experimental platforms for development of key elements within the Waste Management System: realization of a control system (Ussuriisk) and on development of new technologies of Solid Waste processing at mining industries (Dalnegorsk).

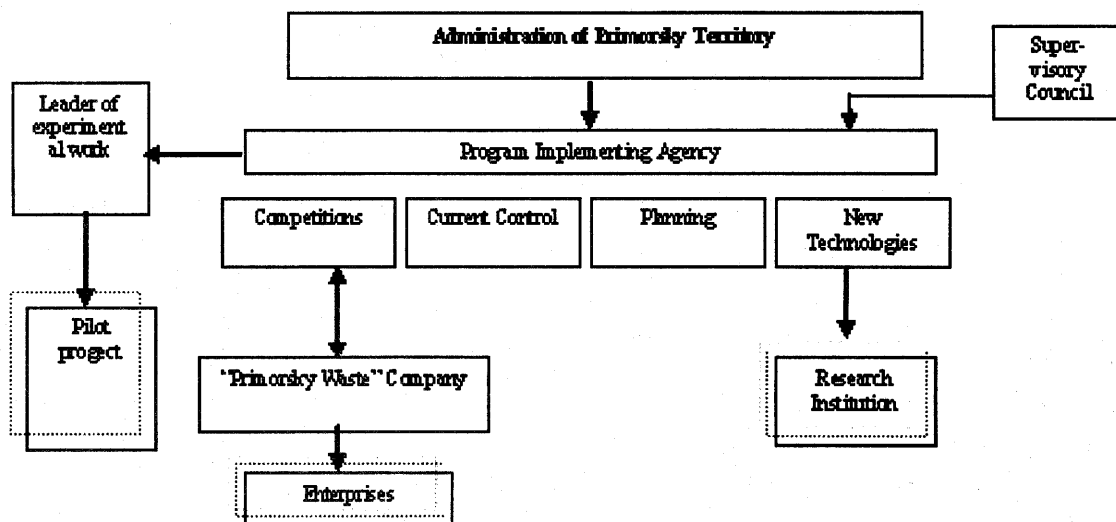


Fig. 3. Program Management Flowchart

IV. The upcoming activity

The program consists of 7 components. They are:

- Development legal regulations of Solid Waste Management system of Primorsky Territory
- A control system of the Solid Waste Management system of Primorsky Territory
- Research and developmental works
- System of Collection, transportation and sorting of Solid Waste
- Processing, disposal and recycling of solid waste
- Rehabilitation of the lands polluted by waste products
- Experimental landfills

V. Summary

The first stage of "Waste" program of Primorsky kri (Russia) realization and recommendations for possible followers in Russia and abroad are given.

Programm's activities will be directed at the commercialisation of new recycling techniques and development of waste standards. Furthermore, under the program a campaign to raise public awareness on waste management will be carried out.

The program planned outputs are to:

- to strengthen the institutional framework through the establishment of a Waste Management Centre, a strengthened waste management function within the Administration of Primorski krai, and advice pertaining to improve waste legislation and enforcement;
- an integrated waste management system for the collection and dissemination of waste management data and information;
- to support to waste prevention and recycling policies through the development and pilot application of economic instruments;
- to educate key stakeholders in modern approaches for integrated waste management.

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