Entrepreneurship development in the field of transport recycling

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Abstract. Waste recycling is an urgent problem that needs to be tackled for the purposes of sustainable development of the international community. Large and permanently growing amounts of diverse production and household wastes evidence the importance of this problem. Due to this, the majority of world countries have adopted certain legislative acts and by-laws aimed at regulation and comprehensive support of activities relating to waste treatment and reuse. Foreign experience of waste management proved that market relations being without state support cannot regulate the processes of waste production, collection, utilization and recycling, especially the processes of resource saving. Most European countries resolve the issues of resource saving and waste treatment by using both state and market mechanisms of regulating waste management works. Russia needs state administration for the development and adjustment of legal and regulatory framework of recycling in order to make the domestic sphere of waste reuse sound and effective. Implementation of waste recycling process requires significant investments that involve both private funds and fund from the federal budget or budgets of constituent entities of the Russian Federation. Today, the need for the development of, first, investing activities targeted at waste treatment and, second, the corresponding production industry, is becoming urgent, since if economic and technical system of waste recycling are not developing, the country will face ecological crisis and a shortage of some raw materials for manufacturing. Transport waste is a source of anthropogenic environmental pollution on a global scale and occurs as an inevitable result of consumer attitudes and an unacceptably low resource utilization rate. Waste is generated at all stages of the vehicle’s life cycle.

1. Introduction

Issues of business management are considered by numerous foreign and domestic scientists. The most famous works include those of such foreign authors as: Mariana Pipirigea, Gheorghe Zaman, Horatiu Strasser, Roxana Aramă, Constanta Strasser Irem Silajdžić, Sanda Midžić Kurtagić, Branko Vučijak, Matthew Fox, Kimberly Wade-Benzioni, Marie Mourad etc. [1-8]. The domestic school is represented by the works of the authors Jahongir Hamdamov, Elena Gafarova, Tatiana Ershova [9-10]. Nevertheless, in classical works the general problems of entrepreneurship are considered without taking into account the specifics of the activities of business entities in the field of municipal solid waste recycling. Certain aspects of business activities concerning recycling are considered in works of the authors of the present paper [11-14].

Thus, it can be concluded that the existing publications have a number of gaps, especially regarding the arrangement of business entities’ activities in the field of municipal solid waste recycling. There is a need to fulfill the scientific task on theoretical justification and applied adaptation of ways to
improve the mechanisms for developing business activities in the field of waste recycling on the basis of mechanisms of resource support for entrepreneurship.

2. Materials and Methods

The methodological basis of the study comprised methods of scientific knowledge (induction, comparison, dialectical contradiction, chronological, system approach, analysis and synthesis), specialized and adapted methods (object modeling, statistical groups) based on applying the general principles of modern management in the field of entrepreneurship.

Data and information from scientific papers dedicated to the problems of business management in the field of recycling municipal solid waste, information and reporting proceedings from official sources comprised the informational and evidence basis for the present research paper. When preparing the typescript, the authors used the proceedings from periodicals, independent analytical agencies, internal surveys taken in business entities, and statistical reporting data from the enterprises under study.

One of the most significant problems in the field of municipal solid waste management is their dumping without utilization. Currently, it is only a negligible part of waste that is industrially recycled. Even the system of collection and processing of recyclables, which was popular in the Soviet Union, is almost destroyed now, being under restoration and adaptation to new economic conditions. By this day, the economy does not have favorable conditions, which would propel the use of recyclables. Therefore, the volumes of turnover, collection, use and processing of recyclable materials are not large. To increase the volume of recycling and reuse of municipal solid waste, a set of organizational measures need to be taken that could significantly intensify entrepreneurial activity in this field.

Thus, the scientific substantiation and elaboration of operational guidelines for not only working out tactical directions for development of entrepreneurship in the field of waste recycling, but also for solving a set of theoretical and methodological problems. The aim of the above said is to develop specialized methods for the estimation of effectiveness of business activities, as well to synthesize the priority areas for improving the system of making decisions on the development of entrepreneurial activities in the field of waste recycling. Due to the low level of waste utilization, waste volumes permanently grow, which causes deterioration of ecological and sanitation-and-epidemiological situation in the country. At the same time, means of economic regulation that are currently applied for the treatment of production and consumption waste do not fully perform their functions. There is a necessity to improve the existing mechanism of business administration in the field of recycling on the basis of efficient economic and organizational measures for the involvement of waste into the economic turnover.

3. Results

In Russia, not excepting its large cities and metropolises, the situation of municipal solid waste treatment does not correspond to the highest foreign standards. In particular, by this day 55% of waste in the USA, 40% in Europe and 81% in Russia are disposed to landfills. The share of burned waste in the USA is 12.5%, in Europe is 20%, in Russia is 13%. As for recycling, Russia (6%) is lagging far behind the USA, where the share of recycled waste is 32.5%, as well as behind the Europe, where this share is 40%. Thus, over 90% of waste in Russia poses an overt threat to the environment. Statistical data on the amount of municipal waste collected by utility services in different countries are presented in table 1 [15].

| Table 1. Amount of municipal waste collected by utility services |
|-----------------------|--------|--------|--------|
| Country               | 2014   | 2015   | 2016   |
| Russia                | 2.4    | 2.5    | 2.5    |
| Austria               | 565    | 560    | 564    |
| Belgium               | 426    | 412    | 420    |

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The tightening of legal requirements for producers of goods and services, which was statutorily prescribed, became one of the most important incentives for the development of entrepreneurial activity in the field of recycling. It served as a driver for creating a demand for environmental technologies, environmentally friendly goods, investments in the environmental industry and led to the intense development of entrepreneurship in the field of municipal solid waste recycling. We may define recycling as a system of organizational-economic and technological measures aimed at reintroduction of municipal solid waste into the economic turnover.

The need to develop entrepreneurial activity in the field of recycling as of a mechanism for ensuring the ecological and economic balance of the territory is caused by negative consequences that appear as a result of the impact of municipal solid waste on the environment, when the level of waste recycling is low (tables 2 and 3) [16].

Table 2. Disposal of production and consumption wastes at facilities belonging to a business entity, according to their environmental hazard classes (thousand tons).

| Hazard class | 2016 | 2017 | 2018 |
|--------------|------|------|------|
|              | Totally | Including places of storage | Including places of burial | Totally | Including places of storage | Including places of burial | Totally | Including places of storage | Including places of burial |
| Class I      |        |                  |                  |        |                  |                  |        |                  |                  |
| Class II     |        |                  |                  |        |                  |                  |        |                  |                  |
| Class III    |        |                  |                  |        |                  |                  |        |                  |                  |

|               | 2016 | 2017 | 2018 |
|---------------|------|------|------|
|               |      |      |      |
|               | 2    | 0.5  | 0.3  | 0.3  | 0.0  | 0.3  | 0.2  | 0.2  |
|               | 15   | 14   | 1    | 283  | 281  | 2    | 2    | 0.1  |
|               | 592  | 494  | 89   | 263  | 170  | 94   | 488  | 363  | 125  |
Currently, the share of recycled materials in the manufacture of plastic products in Russia is only 4-5%. While a total market volume of polyethylene is 550000 tons per year, annual savings for material consumers could be up to 11 billion rubles; while a market volume of propylene is 783000 tons, potential savings would amount 15.6 billion rubles; while a market volume of polystyrene is 474000 tons, potential savings would amount 11.8 billion rubles. The calculations show that when using a glass bottle of 0.34 l size ten times, the energy consumption of one turnover from a producer to a consumer and back amounts 24% of energy consumption for the similar but not-reusable glass bottle made of recyclable material and 9-16% of energy consumed for making such a bottle of primary raw materials.

For the development of entrepreneurship, it is advisable to use modern pricing methods when all participants of the recycling process are interested in effectively solving their own problems. The analysis of effectiveness assessment of recycling technologies for common types of waste proved that the main expenditure included into cost price is the cost of maintaining and operating the equipment, the most part of which is depreciation expenses. As for technologies that regard waste grinding and drying, the costs of energy sources (waste paper, wood waste, worn out tires) are also significant. It should be emphasized that in all cases, the major share of expenses included in a cost price is depreciation, which indicates the high cost of equipment.

Table 3. Municipal solid waste and liquid waste taken off from urban settlements by special vehicles (thousand cubic meters).

| Year | Municipal solid waste | Liquid waste | Municipal solid waste was removed to special waste treatment facilities (waste processing plants and enterprises for the preliminary preparation of waste) |
|------|-----------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------|
| 2016 | 268.758               | 36.854       | 23.880                                                                                                                          |
| 2017 | 274.423               | 36.515       | 27.877                                                                                                                          |
| 2018 | 275.434               | 41.697       | 28.096                                                                                                                          |

High taxation largely impacts the efficiency of waste processing technologies: approximately a third part of the income accounts for taxes (VAT and income tax). The actual period of capital investment recoupment for most of the technologies considered is 3-5 years (excluding the repayment of interest on loans). The amount of payments for disposing waste in landfills is low if compared to capital expenditures for recycling and it does not incentivize enterprises to introduce waste treatment technologies.

Therefore, certain support measures may create favourable conditions for the successful introduction of waste management technologies. First of all, such enterprises should be provided with subsidies, grants and soft loans. To attract private investment, ensure the return on investment and the profitability of enterprises, the authors would recommend a full or partial remission of basic taxes (VAT, corporate tax) for those enterprises, as well as exemption from depreciation charges for the period of capital investment recoupment (1-2 years) or for a longer period. The current environmental expenses are presented in table 4 and figure 1 [17]. These expenses include the costs of waste management, which in 2018 amounted to 79,885 million rubles, which is 12.1% of the total operating costs.
Table 4. Operating environmental expenses (in actual prices; million rubles).

|                      | 2016     | 2017     | 2018     |
|----------------------|----------|----------|----------|
| **Totally**          | **305634** | **320947** | **345464** |
| including:           |          |          |          |
| for air protection and climate change prevention | 56851    | 56906    | 61075    |
| for wastewater collection and treatment | 154313   | 163261   | 173688   |
| for waste management  | 63580    | 70041    | 79885    |
| for protection and reclamation of land, surface water and groundwater | 19526    | 15452    | 15347    |
| for preservation of biodiversity and protection of natural areas | 396      | 422      | 514      |
| other                | 11869    | 14865    | 14955    |

Figure 1. Structure of expenditures for environmental protection in 2018 (in percent).

4. Discussion
Analysis of the current state of business activity in the field of recycling in the Russian Federation allows highlighting the main problems of its development:

- lack of fierce state support for entrepreneurship in the field of recycling;
- insufficient legislation, lack of legislative incentives for the development of recycling and development instrumentation for the use of recyclables;
- low efficiency of the municipal solid waste management system at the local level;
- insufficient level of development of solid waste management infrastructure;
- reduction in the number of reception points for municipal solid waste compared with the 1980s;
- lack of economic incentives for the involvement of municipal solid waste in secondary economic turnover;
- low intensity of inter-territorial interaction when building business networks to ensure the process of municipal solid waste recycling;
- insufficient influence of public and professional associations on decision-making by state and municipal authorities in the field of municipal solid waste management.

The development of the recycling industry is especially beneficial and reasonable during the recovery period of the Russian economy. Under conditions of the acute need for cost savings, the use of recyclables reduces expenditures when producing goods, since the involvement of recyclables in the economic turnover is usually cheaper than the use of primary resources.

5. Conclusions

Today recycling is becoming an important mechanism to solve socio-ecological-economic problems, the severity of which is growing faster than the effectiveness of measures taken to solve them. In this regard, recycling should be considered as an integral part of the socio-economic system of a territory, that creates the prerequisites for improving the ecological and economic balance of regional development.

The authors believe that the development of entrepreneurship is based on a business model that includes transactions of the recycling process with a valid description of costs and revenues. With the account for common structure of municipal solid waste recycling, the general model should involve the following sub-models:

- collection and transportation of municipal solid waste;
- municipal solid waste sorting;
- municipal solid waste processing;
- distribution of recyclable materials to consumers.

Thus, the analysis revealed that the most important areas of entrepreneurship development in the field of municipal solid waste recycling are: working out the directions and principles of tax incentives for entrepreneurship in this area; the construction of an inter-territorial logistical infrastructure for the industrial consolidation of business entities involved in municipal solid waste recycling; the system for assessing economic efficiency of recycling as of a business entity.

The model of entrepreneurship in the field of municipal solid waste treatment include the following components:

- components of the external environment: economic, legal, political, socio-cultural, engineering, physical (geographical) conditions of business entity’s activity.
- components of the internal environment: means of production, personnel, management of a business entity, the business entity itself.
- components of the interaction between the environments that manifest themselves in the following entrepreneurial functions: social; production; financial; HR; marketing; resource.

Transport waste is a source of anthropogenic environmental pollution on a global scale and occurs as an inevitable result of consumer attitudes and an unacceptably low resource utilization rate. Waste is generated at all stages of the vehicle's life cycle.

When choosing a priority method of handling failed automobile waste, it is necessary to consider the possibility of reuse of components included in the waste, as well as to minimize to the maximum
value the amount of substances (waste) that do not have further use. Recycling technologies are relevant when handling automotive waste. The model proposed in the paper describes entrepreneurship with its six key functions, four of which (finance, marketing, personnel, resources) involve relations with the external blocks. These institutions form the actual environment of a business entity, which means that they create the microenvironment for entrepreneurial activity that regards municipal solid waste recycling.

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