Waste Management as Functional Part of the Social Responsibilities of Business

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Abstract. Despite increase in scales and intensity of involvement of natural resources in the zones of direct and indirect anthropogenic influence, now there is no unified approach to assessment of impact on ecosystems of various levels from local to Biosphere in general. Nowadays it is necessary to stress the existence of the conflict between the ability of ecosystems to develop sustainably and environmental management in connection with the growing needs of the person and society, providing destruction of the ability of environment in future affected by economic and social development. Thus uncontrollable waste emission as well as scantiness of natural resources becomes an essential factor which is slowing down development of not only industry and technology itself but all socio-economic system. Solid waste led to poisoning of fertile lands including soil, water, and biota makes the research in the field of waste management highly essential. To disclose various approached to developing social responsibilities of business in the field of waste management and concentration of financial resources on different level of the budgetary system for economic and ecological sustainable development. Analytical research and critical analysis of the positive international experience of creation of the system of business and government shared responsibilities in the field of waste management. The directions of realization of the principle of expanded social responsibility of business in modern conditions are revealed. Recommendations about providing financial sources of waste management within the system of business and government shared responsibilities and partnership in the field of waste management are developed.

1. Introduction

At the beginning of this century, one of the contradictions of the present time was disclosed from the new point of view. The ecological sustainability of regions is keeping in conflict with the industrial strategy of the regional development, which determines the level and life stability of the population [10, 12, 13, 17, 18, 19]. Today we are forced to note that the state is incapable effectively to cope with a problem which solution demands considerable financial resources, identification and application of additional technical, human and other resources and opportunities. More often in modern Russia business acts in the role of such additional resource [4].

On the one hand, it helps to solve a problem of financing of the nature protection enterprises, relevant at the present stage, and, on the other hand, strengthens the image, being rehabilitated in the
opinion of citizens who quite reasonably see the reason of deterioration in an ecological situation in the enterprises. In this case business carries out policy of expanded social responsibility by the means of fulfilling the program of nature protection actions, including environmental monitoring. The mentioned above actions are aimed to decrease in negative anthropogenic impact on the environment, to preserve, improve and use rationally nature-resource capacity of the country.

One of the directions of expansion of responsibility of the enterprises which activity is inevitably connected with environmental pollution consists in improvement of the organization of waste management at the enterprise [11]. The current situation in processing of the municipal solid waste (MSW) is quite sad. So, for the first decade of the 21st century the mankind used so much plastic how many for all the 20th century, and as a result its most part has got to the earth and the ocean [21, 22].

According to the report of the Ministry of Natural Resources and Environmental Protection of the Russian Federation in the country more than 60 million tons of MSW are annually formed that makes about 400 kg of waste on 1 person a year [3]. Only about 7 - 8% of the collected MSW are involved in economic circulation, their other volume goes for burial in spite of the fact that useful fractions contain approximately in 60% of MSW. In the European Union countries there is more favourable situation, nevertheless, as of 2012 only 24% of plastic went for utilization, about 50% went to dumps, and the rest was burned [9].

The purpose of this work is the critical analysis of the long-term international practice aimed to work out an optimum solution of the problem of utilization and processing of municipal solid waste for development of the system of expanded responsibilities of the producer to environmental pollution.

2. Theoretical and legislative basics

Mutual relations between business and state in the working out the solution of environmental problems can be shown in various ways. Depending on a type of negative impact on the environment, it is possible to allocate various directions of business participation in nature protection actions [6, 14, 20].

1. At the stage of a production cycle: the production modernization aimed to reducing of industrial emissions; usage of ecologically sparing technologies.

2. Weakening of technogenic pressure on the territories subject to pollution: (i) development and deployment of new, including knowledge-intensive, more effective ways of purification of soil and water; (ii) implementation of actions for recycling instead of their burial, carrying out developments on creation of low-waste, waste-free, and resource-saving technologies; (iii) usage and processing of secondary raw materials.

3. Development of the program of expansion of social responsibility of business in monitoring of environment: creation of the research laboratories, carrying out initiative ecological audit, financing of programs of training of specialists which are carrying out ecological audit and assessment socially – economic consequences of negative impact on the environment.

All necessary basics for realization of this system are stipulated in provisions of the Federal law [1], which provides for producers and importers liabilities to ensure collecting and utilization of a considerable share of waste of production made and placed on the market. Waste management could be undertaken by the following ways: by means of the order utilization services by producers and importers to processors; by investing into own objects for processing; by merging of producers in the unions for presentation to the market of the consolidated, stable, solvent, and growing demand for processing of waste, including packing waste (independent realization of responsibility).

3. Results of the analysis and suggestion on introduction

Activities for improvement of waste management assume that besides those problems, which are solved by the producer in the organization, some issues outside the enterprise also, has to be implemented. The principle of the expanded responsibility of producers (ERP) has to be applied to collecting, sorting, processing and restoration of waste of consumption. The ERP principle means liability of the producer for ensuring collecting and utilization of a considerable share of waste of production made and put on the market. ERP includes producing, distribution of the made production,
recycling, control over the expiration dates, processing and / or re-use of waste. While previously the usual liability of the producer included liabilities have been restricted by only producing, distribution of production and recycling. Thus, ERP is a political approach that transfers a part or all responsibilities on producing and/ or packaging from public authorities (municipalities) to producers of this production and/ or packaging. Consumer waste represents the greatest number of all packings, and they are most difficult for collecting. Due to application of ERP principle industrial, commercial and packing wastes are formed in the smaller number of places and then they are collecting, processing and recycling. ERP can be applied by utilization of the following mechanisms [2].

1. Collecting, sorting, processing and recycling of waste (or their parts) is carried out by the organization itself independently by creation of their own infrastructure or signing contracts with the operators who are carrying out this type of activity that quite corresponds to a current trend in outsourcing in the business organization and structuring. The advantage of this method is positioning of the certain producer, improvement of his image. As a shortcoming it is necessary to indicate significant costs and difficulties in administration of mentioned above projects. Reasonable approach to the solution of problems in the sphere of waste management for the organization is merging (co-operation) of producers and creation of joint infrastructure.

2. Alternative approach is the payment of ecological fee (tax) [8].

Brief assessment of advantages and disadvantages of both approaches provides us with the following results [4]. The ecological fee (tax) paid by the organizations is only an alternative. At the same time as the attractive side of this mechanism it should be noted simplicity of execution and lack of the transaction costs connected with creation of own infrastructure (we should understand the expenses connected with the organization and administration of tax payment as transaction costs). The doubtful efficiency of payments and utter impossibility of the organizations to control growth of rates acts as essential minus. Unlike option when the organizations independently carry out collecting, responsibility for processing passes sorting, processing and recycling by creation of own infrastructure or signing of the contracts with the operators who are carrying out this type of activity, in the situation of payment ecological fee (tax) the responsibility to undertake waste management goes to the state authorities. In this case, ecological fee (tax) is not a part of ERP, turning into the quasitax shifted as the result to the consumers of goods (under quasitax can be understood the obligatory payments which have no legal features of a tax, for example, individual gratuitousness, compulsoriness of collecting or a provision in the tax law).

The comparative analysis of approaches has shown that the most efficient and productive mechanism of expansion of responsibility is merging of producers [5]. This approach is initially focused on the consumers and allows to the government to reduce administrative burden in this area. Creation of joint infrastructure allows accumulating financial resources in volumes that each separate enterprise is not able to afford, solving environmental problems individually. Co-operation in the infrastructure creation allows to carry out materially and to control effectively actual waste management.

At the same time, expenses of participants of co-operation of producers are controllable and rather low (lower than the cost of services of the operators carrying out collecting and recycling) because in joint created infrastructure there is no place for the task of commercialization of activity and it is not directed to generation of profit.

On the other hand, the imperfection of the legislative base and lack of the state support can lead to serious negative consequences for an ecosystem. It is also important to keep in mind the following fact that unfair producers for the purpose of extraction of personal both financial, and reputation benefit can enter association.

Analysis of advantages of merging of producers and creation of joint infrastructure to all participants of process, including the state provides the following results. 

**Producers** due to association reach decrease in costs for collecting, sorting, processing and/or restoration of municipal solid waste.
The state as positive effect of involvement of producers in the program of expanded social responsibility receives decrease in amount of MSW on grounds as so producers realize the program of utilization, and reaches the solution of questions of environmental protection, without incurring at the same time additional expenses on undertaking nature protection actions.

The population which directly or indirectly doesn't pay for the participation in these projects as positive effect receives environmentally friendly conditions of activity, lack of huge landfills on the neighborhood and also effect of participation in ecological programs of the state just due to sorting and separate collecting of garbage/waste.

Such policy of expansion of social responsibility by the organizations whose activity is inevitably connected with environmental pollution, in general is favorable to the state, because allows to reach the solution of tasks in the sphere of environmental control and holding nature protection actions, without providing additional financial resources from budgets of the budgetary system of the country. However, without the state support achievement of the target becomes unreal. One of the most significant problems is insufficiently developed legislation. To eliminate this defect it is necessary to define accurately a role and responsibilities of each member on such co-operation.

1. producers undertake financing of all projects running by the co-operation;
2. the government establishes standards and rules of recycling;
3. regional authorities can update requirements and also have to provide control;
4. municipal authorities support realization of this policy at the correspondent level;
5. merging of producers operates this activity on behalf of their members in partnership with authorities and also inform the citizens and the state on results of the carried-out work.

One of the directions of realization this state–private partnership in the solving of problems of ecologically adverse territories, is the co-operation of the state and the enterprises polluting the environment for monitoring of zones with the increased level of air and the soil pollution, and also creation of the research laboratories in joint maintaining the state and enterprises.

Educational communication programs have to become also very important element in the developing of the program of state–private partnership in the sphere of waste collecting and recycling. Here it is necessary to take into account traditional nihilism of urban population, lack of a habit to waste sorting and in general the irresponsible relation to their utilization. In this question the country population which owing to lack of the centralized refuse chutes carry out at least sorting of solid and liquid waste, food and nonfood is more advanced. Therefore it is about traditional ecological nihilism of urban population just because the country people in Russia owing to a way of life in the majority are forced to carry out primary sorting of household waste. For this reason, it is essential to pay special attention to the necessity of educating of new generation of consumers, changing of a framework of thinking from “consumer approach” to natural resources to “reproductive approach”. Impact on the behavioral model of the buyer is necessary. In the Soviet Union, for example, plastic bags practically did not get to waste not because of high ecological consciousness of buyers, and because of their inaccessibility, limited quantity in the market that influenced making decision on repeated reuse of plastic bags. In Germany now repeated use of plastic bags is reached by the fact that they have stopped being free in supermarkets. Nowadays the only way out is to change the behavioral model of buyers, develop and carry out educational and communicative programs in the sphere of ecological literacy of the population and stimulate of growth of ecological consciousness. Protective measures in the field of ecology only begin to be developed in Russia, for effective implementation of policy of environmental protection a valuable reference point is successful foreign experience. In this situation experience of Japan, in which the legislation on recycling was accepted only in the 90s the 20th century, is of high interest. Nowadays the Japanese economists and sociologists discover the necessity of creation of ecologically focused society which is characterized by rational use and reproduction of material resources in combination with maintenance of high level and quality of life.

In Europe in 2015 separate garbage collecting of paper, glass, metal, and plastic became obligatory, however still it was not succeeded to achieve it fully. On average in the European capitals only 19% of waste is exposed to separate collecting. Experts allocate three capitals in Europe as a positive example
of successful realization of strategy: Helsinki, Tallinn and Ljubljana. A share of separate collecting waste in these cities I have reached 38.6%, 47.2% and 55.4% respectively [23]. In general, turnover of plastic at the legislative level is regulated approximately in 40 countries [15, 16]. Various mechanisms are used, for example, in Great Britain and Germany special fees applied at the moment of sale on each disposable package is established (interesting to note that funds from these fees are allocated not for the solution of ecological tasks, but for support of social public organizations). Taxes on plastic packages are implemented in Ireland, Denmark, Latvia, and Israel. In California (USA) distribution of all plastic disposable packages, except for into what foodstuff is packed in the factory way is strictly forbidden. In France within Ecological strategy - 2020 the restriction on sale of plastic bags less than 10 liters and a subtlety less than 5 microns works. Tighter restrictions work in Italy, Australia, Egypt, Argentina, Singapore, and Tanzania where any use of disposable packages in retail is forbidden. By other way regulation of a turnover of plastic in Kenya, Tunisia, Mauritania, Eritrea, Rwanda and Ethiopia has gone. The states did not introduce the special taxes or fees connected with the sales of plastic packaging, and have preferred to realize the most stringent scenario by introduction of punishment in the form of a large penalty up to imprisonment for a period of up to 4 years, for production and distribution of disposable packages. It is reasonable to assume that in Russia it is necessary to realize economic approaches rather than dramatically restrictive measures, as in Kenya. Besides that it is necessary to influence behavioral model of the buyer, the state support and stimulation of technologies for processing of the used packing and also stimulation of retailers to the voluntary agreement for processing of waste is also important. The point is in not only the recycling of plastic and other municipal solid waste. Any initiative of business to make production more eco-friendly and eco-oriented has to find support of the state.

It is possible to consider as a positive example the successful in Europe and approved to realization in Russia project of the H&M Company "Fashion in support of the Environment" company. H&M initiative of collecting unnecessary clothes has been created with the purpose to reduce quantity of the thrown-out textile products and to close a technological cycle of production and processing in the fashion industry. The company carries out collecting the worn-out, torn or unfashionable things that go to switchyard where they are qualified or processed. The purpose of the company is providing a cycle of waste-free production. Things, too worn out or torn, not subject to reuse, are processed into raw materials or new products, into textile fiber that is applied to the shock absorbing and isolating materials in the car industry. For today there is no direct economic effect of implementation of this project at the H&M Company, and the benefit lies only in capitalization of the image of ecologically focused company. Nowadays question of granting by the state of tax benefits and preferences to the business undertaking the ecological initiative should be deeply researched and discussed [7].

4. Conclusions

According to our opinion, the most effective and productive way of solving socio-economic problems is strong co-operation between state and business and increasing the social responsibilities of business. Creation of joint infrastructure for performing nature protection actions by the organizations (including, environmental monitoring), which are carrying out environmental pollution allows accumulating financial resources in volumes that each separate enterprise is not able to afford, solving environmental problems in an individual order. The performed analysis of the legislative basis and the international experience has revealed that in the system of state – private partnership such element as the consumer has to be represented actively. In this system roles and duty can be distributed as follows:

- the Government defines the general reference points and establishes the general standards of utilization;
- territorial subjects of the Federation introduce additional requirements and provide control of activities for recycling;
- municipal authorities support the organization of processing and restoration of waste of packing;
- producers maintain expanded responsibility of producers by creating and financing merging of producers;
- merging of producers operates collecting, sorting and restoration of waste;
- operators according to the address with waste render high-quality services in collecting and sorting of waste;
- processors process the sorted waste and make secondary resources or new goods;
- consumers carry out separate collecting waste not only houses, but also in public places.

Such allocation of roles and duties discloses the following tasks:
- realistic standards of utilization have to be developed by the government;
- development standardly – the legal base governing the relations in the sphere of collecting and recycling is necessary;
- education and communication waste management programs are becoming more and more important.

Thus, liability of the producer, carrying out negative impact on the environment, is impossible to limit only by the concept of ERP meaning control of utilization and / or reuse of waste.

5. References

[1] Federal Law as of 28.12.2016 N 486-FZ About introduction of amendments to separate acts of the Russian Federation
[2] Federal Law as of 29.12.2014 N 458-FZ About introduction of amendments to the Federal Law as of 24.06.1998 N 89-FZ *About industrial and consumption waste
[3] Order of the Ministry of Nature Resources as of 14.08.2013 N 298 About the adoption of complex strategy of the address with solid municipal (household) waste in the Russian Federation
[4] Bashkirova N N and Lessovaia S N 2017 Approaches to the resources creation for nature protection actions on the ecologically adverse territories (Podhody k formirovaniyu istochnikov dlya provedeniya prirodoohrannyh meropriyatij na ehkologicheski neblagopriyatnyh territoriyah) Bulletin of Moscow University. Series 26 "State Audit" 3 37-46.
[5] Bashkirova N N and Lessovaia S N 2017 Industry of mono-cities as a factor of destabilization of the ecological situation in the country (Promyshlennost monogorodov kak factor destabilizacii ehkologicheskoj situacii v strane) Migration Law 4 24-26
[6] Bashkirova N N and Lessovaia S N 2018 State and business co-operation in settling socio-economic issues: forward to sustainable development of ecologically unfavorable IOP Conference Series: Earth and Environmental Science 107(1):012128 DOI :10.1088/1755-1315/107/1/012128
[7] Bloshenko T, Ponkratov V and Pozdnyaev A 2016 Development of methods for determining differentiated rates of mineral extraction tax in recovery of solid commercial components from technogenic and natural fields. Indian Journal of Science and Technology 27
[8] Bloshenko T A, Ponkratov V V and Pozdnyaev AS 2017 Methodology for identifying the differentiated mineral extraction tax rates relating to the recovery of solid minerals Journal of Environmental Management and Tourism V 8 1(17) 60-66
[9] Koshkina A 2017 Plastic bog (Plastikovaya tryasina) Profile 2(34) 26-28
[10] Koeppel J, Geissler G 2015 Environmental assessment research in Germany: retrospect and prospect Journal of Environmental Assessment Policy and Management 17 1 1550010
[11] Kirkby J T, Birgisdottir H, Hansen T L, Bhander GS and Hauschild M 2006 Environmental assessment of solid waste systems and technologies: EASEWASTE. Waste Management and Research 24(1) 3-15
[12] Li Z, He W, Zheng H and Chen L 2017 Evolvement and driving forces of cultivated land ecological security spatial pattern Boletin Tecnico 55 6 352-363
[13] Mandich A F 2006 Ecosystems in the beginning of XXI century Environmental management and sustainable development World ecosystems and problems of Russia (Moscow: KMK Scientific press Ltd) pp 48-77

[14] Maslova A N 2011 Monocities in Russia: Problems and Solutions Kontury globalnyh transformacij: politika, ehkonomika, parvo 5

[15] Ostrovskaya I M 2012 International experience of organization of state management of nature protection activity Gaps in the Russian legislation. Legal journal 1 115

[16] Petts J 2001 Evaluating the effectiveness of deliberative processes: Waste management case-studies Journal of Environmental Planning and Management 44(2) 207-26

[17] Plieninger T, Draux H, Fagerholm N, Primdahl J, Biebling C, Bürgi M, Kizos T, Kuemmerle T, Verburg PH 2016 The driving forces of landscape change in Europe: a systematic review of the evidence Land Use Policy 57 204-214

[18] Plieninger T, Kizos T, Biebling C, Dû-Blayo L L, Budniok M-A, Bürgi M, Crumley C L, Girod G, Howard P, Kolen J and al 2015 Exploring ecosystem-change and society through a landscape lens: recent progress in European landscape research Ecology and Society 20(2) 5

[19] Ptichnikov A V, Voropaev A I, Mandich A F, Blygakova V A and Mokryshina L S Dynamics of forest lands and forest resources of Russia In Change of the environment of Russia in XX century (Moscow: Molnet) pp 50-70

[20] Sulakshin S S 2010 Criteria and basics of the modernization of Russia (Moscow: Scientific expert)

[21] Sumina O and Lessovaia S N 2016 Clay Minerals in the Loose Substrate of Quarries Affected by Vegetation in the Cold Environment (Siberia, Russia). In Biogenic-Abiogenic Interactions in Natural Anthropogenic Systems, Lecture Notes in Earth System Sciences (Switzerland: Springer International Publishing) pp 249–59

[22] Wilson D C 2007 Development drivers for waste management Waste Management and Research 25(3) 198-207

[23] Wilson D C, Rodic L, Scheinberg A, Velis C A and Alabaster G 2012 Comparative analysis of solid waste management in 20 cities Waste Management and Research 30(3) 237-54