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The papers study the following problems: sustainable development of local production systems, business strategies of LPS, innovativeness of clusters, critical infrastructure protection, corporate social responsibility, environmental protection, local production system management, governance of local production systems in Bulgaria, Poland, Ukraine and Russia, policy guidelines with some measures of general application, aimed at problems observed in all LPS, and some specific measures differentiated according to a typology of local production systems.

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SOCIAL, ECOLOGIC AND ECONOMIC ISSUES OF UTILIZATION OF NOVOSIBIRSK OBLAST WATER RESOURCES

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INTRODUCTION

The Novosibirsk Oblast is located in south eastern part of West Siberian Plain, mostly in-between rivers Ob and Irtysh. Its length from west to east is more than 600 km and from north to south – more than 400 km. Its territory is 177.8 thousands square km. and borders on Kazakhstan, the Altai Krai, Kemerovo Oblast, Omsk Oblast, and Tomsk Oblast. The climate in Novosibirsk Oblast is continental; specifically it is apt to sizable temperature fluctuations (within 24 hours, seasons, and from year to year), low volume of atmosphere precipitation (250–500 mm per year) and its uneven distribution throughout a year (70% during warm season), and unstable moistening of the territory in different years.

Around 430 rivers that run more than 10 km and 21 rivers that run more than 100 km are in the territory of Novosibirsk Oblast. The largest rivers among them are Ob and Om. The Novosibirsk Oblast is among the lands with deficit in water supply. In low flow periods the deficit reaches 8 million cubic meters of water per year, that fact negatively influences environmental conditions and conditions for social and economic development. Let's briefly consider main issues of low water years.

DECREASE OF RIVER STREAM FLOW AND WATER CONTENT OF LAKES UNDER THE INFLUENCE OF BUSINESS ACTIVITIES AND CLIMATIC FACTORS

The Ob-Irtysh basin is the main source of drinking water, domestic, industrial and agricultural water supply for the Novosibirsk Oblast. Hydrological situation is negatively influenced by water extraction for domestic and household needs. Solution of this problem is connected with the withdrawal of sand and gravel mix from Ob river bed. During sand extraction the river is sinking and water intakes become “bare”. This situation inevitably leads to an increase of risk of emergency situations occurrence.

Dredging operations and other types of anthropogenic activity (development of water collecting areas, swamp drainage, channel rectification, and etc.) change the formation of river flows and hydrologic behavior of many watersheds. Due to this reason water ceased to be a renewable resource to the full extent in several districts of the Novosibirsk Oblast. Minor rivers disappear under the influence of business activities and climatic factors.

Rise in air temperature causes water to evaporate more from the soil surface, so swamps and lakes are gradually drying up. More than 3500 lakes are located in Novosibirsk oblast. Each of them is 1.5 square km. Lake Chany, the largest lake after East Siberian lakes Baikal and Taimyr, West Siberian natural water reservoir fed by low rivers Kargat and Chulyum, is being dehydrated. During last centuries, the lake is drying out, its wa-

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ter becoming more salty, and its water surface area changes according to fluctuations of climatic factors and moisture intrasecular cycles, as well as a result of development of adjoining territory.

At the end of 18th century the area of Chany system reached 10–12 thousand square km, in the beginning of 19th century – 8 thousand square km, and today it is 3.6 thousand square km. The researchers assumed that in 1840s the lakes of Chany system fell into separate water basins. Since that time Chany lake is within the confines of modern basin. Lake Chany drying process stipulated changes in temperature and oxygen regimen of water, as well as formation of expansive shallows, 25% of shallows freeze through the bottom, thus significantly decreasing fish resources. The drying process had led to the increase of water salination up to 20 grams per liter. This presents a threat to all aquatic organisms living in the water basin.

In the last decades Ubinskoe Lake lost around 60% of its total volume, became much shallower, its depth dropped down from 1.5 meters to 70 centimeters, and the level of its water salinity has grown.

The data of state monitoring network show that climate warming in Siberian territory proceed almost twice as fast as total climate warming on the planet. From 1976 to 2011 average annual air temperature in West Siberia had grown by 0.9°C, and in East Siberia – by 1.8°C. According to existing prognosis, the air temperature in Siberia in 100 years will be warmer by 8°C, and in the world – in average by 2°C, than at present. [Frolov A.V. Razvitie sistemy gidrometeorologicheskoi (vodnoi) bezopasnosti Urala, Sibiri i Dalnego Vostoka // Vestnik Soveta Bezopasnosti Rossiiskoi Federatsii (Development of hydrometeorological (water) safety of Ural, Siberia, and Russian Far East // Bulletin of Security Council of Russian Federation) – 2012. – No 4. – P. 108–117 (in Russian)]. The temperature increase already caused a decrease of Ob river water content during summer by 17–30%. This presents a danger to natural environment, hydraulic power industry, shipping industry, and domestic water consumption.

DAMAGE TO AGRICULTURE FROM DROUGHT

The Novosibirsk Oblast is located in the area of risk farming with unstable natural moistening of lands. In the dry year of 2012 country people did not receive total volume of revenue they planned to get. Dry winter and spring had caused winter crop failure and did not allow to aggregate necessary volume of moisture in a land for development of spring crops. The summer was also unexpectedly hot. So, for example, in July of 2012 for the first time in 113 years of monitoring in Novosibirsk the volume of water precipitation was only 3.5 mm. Deficiency of water precipitation destroyed significant part of scarce emerging crops. Cereal crop capacity was just 11 dt/ha (hundreds kilograms per hectare). Severe natural and climatic conditions caused the damage of 400 thousands hectares of cereal crops. The damage caused to agriculture by dry season was estimated at 4 billion rubles.

Although oblast was able to fully satisfy demand in cereal crop, its export to other regions came out at only 400 thousand tons (in 2011 its volume had reached 1.5 million tons). Agricultural producers suffered from the dry season (566 farms) received additional state support – 3.5 billion of rubles. Allocated funds were directed to reimburse the expenditures connected with purchasing mineral fertilizers, crop protection agents, transportation expenses, as well as for launching regional programs for development of beef and milk cattle breeding. [Novosibirsk Oblast farms suffered from dry season will receive state support / <http://nsk.sibnovosti.ru/society/203950-postradavshie-ot-zasuhi-hoz...> (request date 31.10.2013)].

NEGATIVE EFFECT OF LACK OF WATER ON FISHERY RESOURCES

Lack of water has a negative impact on the Ob river ecology. For example, several dozen tones of fish perished in March–April of 2013 as a result of sharp decrease of water level in Ob reservoir storage. In the shallow waters near Novopichugovo settlement 75.8 thousands specimen of perished young fish were found. Mainly they were perch and pike-perch. The damage was equal to 70 million rubles. In the next two years the catch has decreased by 200 tones.

In 2013 as well, a fish fell a victim of the spring: laid spawn and larva dried out in shallow waters. The residents of private homes on Ob shores gathered dead caviar to feed their live stock and poultry.

Spawning season conditions are dramatically deteriorated due to the lack of water in Ob and the water reservoir, and due to drying out of riverside coves. If fish will be laying spawn in the river, than most of it will die. Novosibirsk fishery biologist help to river dwellers – they create artificial spawning sites from spruce garland with assistance of specialists from the Verkhneobsk basin authorities, processing companies, fishermen, and environmental NGOs. Establishing these spawning sites allows producing 150–200 tones of marketable fish. Under conditions of shallow water this job is obligatory; otherwise all fish in Ob may disappear in the coming years. Siberian white salmon, Siberian sturgeon, taimen, sterlet and muksun are already added to the Red Book of the Novosibirsk Oblast (list of endangered species).

The drought leads to extinction of lake fish as well. Its mass extinction was monitored in 2012. Whitefishes were affected most of all. For them the water temperature above +28°C is deathful. Only 22 tons of fish were fished out instead of planned 720 tons. Due to the lack of water the lake fish continued to perish even during winter time. For example, channels connecting Bolshie Chany and Yarkul Lake became significantly shallow and one of them completely dried out. One of the channels was cleared out during preparations to severe winter, and fish was able to enter Yarkul Lake for wintering. The lake froze almost through a bottom, so Malie Chany was desolated during spring of 2013.

During Soviet period in Sartlan lake (the third by size in the Novosibirsk Oblast) peled was fish-farmed on a large scale. However, in the last years its quantity in the water basin of federal status is decreasing. Peled is being replaced by inferior species, such as crucian carp, river perch, and dace. In the Novosibirsk Oblast the fish stock is being replenished in deep lakes that are rich with food supply and suitable for raising marketable fish.

More than 150 lakes have been rented for a period of 10 years already: for example, lake Kankul in Kargatsk raion, Okunevo in Bolotninskyi raion, Pushkary in Chistoozer-noe, Sladkoe in Zdvinskyi raion, and many other lakes. Valuable fish species are fished-farmed, such as peled, mirror carp, and common carp. So the weight of peled may grow up to 140–170 g during summer. The target program “State support of fish rearing for sale development in the Novosibirsk Oblast during 2011–2013” is aimed at the replenishing of fish resources. If 2012 was disastrous, then in 2013, which was a high-water year, fish catch was not bad.

Nevertheless the situation with lakes remains a difficult one. Complex measures are taken to preserve valuable fish species and to redound their quantities to fishery level. Thus, aerators to oxygenize the lakes are used where fish kills took place in the Novosibirsk Oblast. Breams are being trapped with a help of trawler fleet. The decrease of redundancy in bream population will enable peled and muksun to find food easier. The fight with poachers, who savagely catch a fish, is underway. And many other activities, aimed at replenishing fish population, are also initiated.

NECESSITY TO RECONCILE THE INTERESTS OF WATER USERS

In Ob river basin the demand of water users exceeds the possible supply of water resource even if flow regulation is taken into account. In the beginning of 2008 precipitation volume was half-sized as compare with the average value in West Siberia. Due to this fact, in May the water-level in Ob was equal to 43% of average rainfall. According to the West Siberian Hydrologic Center such precipitation level was not recorded since 1973. There is a problem of reconciliation of interests between utility providers, those who work on the river, and energy suppliers.

The high priority was given to water supply of Novosibirsk, the city with the population of 1.5 million, and to its satellite town Berdsk. The rest of the issues were resolved whenever possible. The cargo fleet was headed to the North loaded only by half due to the shallow channel, and navigation had ended earlier than usual. In the first quarter of 2008 water deficit resulted in decrease in electricity production by Novosibirsk Hydro Power Station (HPS) by 30%. Planned repair work had to be delayed in order to keep in operation the biggest Novosibirsk Steam Power Plant-5.

In 2011 almost in all regions feeding river Ob the record low water level has been monitored. During warm and dry autumn the precipitation volume in south east of West Siberia was lower than the mean annual rainfall and by the end of September the water levels were at the extreme low-level in many places of Ob. Net inflow volume to Ob water reservoir had decreased due to water depletion. So, in October the inflow volume to Novosibirsk Hydro Power Station site was equal to 57% of norm. This phenomenon never happened over the entire history of the Novosibirsk HPS existence since 1957.

The extreme low water level in Ob basin remained in 2012. In March, the inflow in the area of the water intake facilities (located lower than the Novosibirsk HPS site) was less than the volume of water intake for the needs of Novosibirsk. As a result of Ob water content depletion the decrease in Novosibirsk HPS power production by 3–10% from design level is anticipated. The situation at the HPS may become critical in case of lengthy low water period within the limits of water intake facilities at the water reservoir. [Profiriev B.N. *Priroda i ekonomika: riski vzaimodeistviya / Ekologo-ekonomicheskie ocherki* (Nature and economics: counterparty risks. Ecology and economics notes) in Russian / edited by Academician of RAS Ivanter V.V. – Moscow: “Ankil”, 2011, 351 p.].

In summer of 2013, a tense situation between Novosibirsk HPS directorate and project developer “Eklon” (“Kvarsys” group of companies) had arisen. The project developer launched earthworks in order to begin the construction of multifamily housing on the lot tightly adjacent to the right-bank earth embankment of Novosibirsk HPS. This embankment is a part of the water front of waterworks facility and it is necessary for normal operation of the whole construction. A collecting drain which carries filtration water off embankment was built opencut across the development area.

According to HPS specialists’ research subsurface parts of the apartment building under construction will create obstacles for underground filtration flow, thus ground water level in the earth embankment will rise and it will be flooded. Head office of Novosibirsk HPS demanded the project developer to stop the construction of apartment building in water protection area and reconstruct the original land configuration of the site, since this activity puts at threat the safety of HPS operation.

Increase of water course instability, landslides and other negative events might occur due to the misuse of lands located within water protection areas and coastal buffer zones. Unfortunately, the new Water Code of Russian Federation lowered the level of defense: the number of water protection areas was diminished, i.e. territories adjoined to surface area of body of water, where special conservancy mode was set. In previous years the

minimum size of water protection area along Ob was set up to 4km, but according to the new norm – up to 200m. Physiographic features of the region are not taken into account: during high-water period overflow land is flooded at the distance many times as great as established norm.

The easing of standards also occurred in the sphere of utilization of water bodies by private and juridic persons. Earlier version of regulations regarding water protection areas was much stricter and did not allow construction works within 200 meters of sanitary zone. At present new regulations allow construction works in close vicinity to water where there are pollution control facilities 20-meter areas of public service. Moreover, the new Water Code provides for possible rent of shore line to build an elite housing with personal wharves, boats, etc. (provided that waste treatment facilities are present at the site).

Interagency task force, which included representatives of government authorities and businesses was organized for online regulation of the water reservoirs and for the congruence of interests between all water users with due regard to environmental requirements made by Federal Agency for Water Resources.

Serious problems occur not only in draught years, but in high-water years as well, prompting state authorities to take adequate measures. The winter of 2010–2011 was snowy (precipitation level was around 128 mm.). But the winter of 2012–2013 pretend to be in top of the snowiest winters in the last century. In a period from November to January 137% of the standard norm of precipitation fell out. Snowfalls became a major cause of traffic jams, although the situation was worsened by the increase of new automobiles (27.5 thousands in Novosibirsk within a year, and up to 1 million units in the Novosibirsk Oblast). In Novosibirsk the highest road congestion was monitored in November and December. Snow was piled along roadsides, thus making roads tighter for 1.5–2 lanes and decreasing their capacity. Novosibirsk municipal administration set new rules for municipal improvement and city cleaning enabling to conduct snow removal (not only on the roads, but in neighborhood areas as well) in timely manner in order to improve work of the road and transportation complex.

The first snowmelting station, which started its operation in December 2013, will enable to close snow accumulation sites in the city center and to utilize snow, collected in the city. Canadian equipment processes 180 cubic meters of snow per hour, and during double-shift work – more than 3 thousand cubic meters per 24 hours. The station operation is more expensive then snow accumulation but it promotes environment protection: during utilization snow is being cleaned and only afterwards it is poured down into the river. And the sand, which was spilled on the roads, is getting recycled.

The mayor office invested 30–35 million rubles into preparation of the ground, electricity provisioning and gasification of the new station. The private investor spent 40 million rubles for procurement and installation of the Canadian equipment. The payback time of the snow melting station is 5–7 years. In the next 3 years 4 new snow melting station are planned to be constructed. This will allow abandoning the practice of the snow accumulation sites in the future. It is expected that in winter with average level of precipitations the stations will provide 80% of total city demand for snow utilization.

In the summer of 2013 streets of Novosibirsk have been flooded even after short rainfalls more than once. Rainwater or melt water, while accumulating in the ground, destroys constructions, reduces house footing durability, floods basements, cellars and other facilities, as well as garden patches. Water drain and storm sewer systems should help in removing water surplus. The most part of the storm sewer systems was projected and built in 1960s, and since then no repair works were done. But at the same time a workload on these systems was growing as new residential areas appeared.

Today, according to available estimations, just 40% of street and road network is provided with storm sewer systems, and trunk road system – by 90% and more. In a number of city districts floods happened due to the fact that half of monthly norm of precipitation fell during short time period. Storm sewer systems located in courtyard areas not always were capable to remove such volume of water because these systems either were worn out or clogged. Huge water pools caused traffic jams many kilometers long and road traffic incidents.

Cleaning of storm sewer system is a costly affair. In some cases it is cheaper to replace clogged part of a sewer than to scour it out. Pipeline diameter is also important factor. Sometimes it is not big enough to drain off water. In such cases pipes of a larger diameter should be installed. In 2012 “Gormost” put on the books 50 km of abandoned storm sewer system, scoured them out and constructed additional drain-water inlets. It allows for water, coming from block courtyards, to be channeled directly in the yards.

Fulfillment of the target program “Modernization and development of storm sewer system of the city of Novosibirsk in 2013–2025” (Regulation N 2670, dated 22 March 2013) will help to improve citizen’s living conditions. It is planned to direct more than 170 million rubles for this program implementation. More than 5,000 kilometers of storm sewers will be produced, 300 new rainwater inlets will be installed and 150 inlet wells will be repaired.

Let us look at other important issues connected with water factor. Their urgency grows or lessens depending on low-water or high-water years (periods).

DETERIORATION OF WATER RESOURCES QUALITY

Business activities not only reduce the size of river runoff but also deteriorate a quality of water. In recent years the volume of water taken in from water sources of the Novosibirsk Oblast for needs of social and economic development decreased by 8%. If in 2007 it equaled to 768 million cubic meters, then in 2012 only 706 million cubic meters of water resources were taken in. The dirty discharge increased by 9.8%, from 101.47 to 112.53 million cubic meters, during this period. In 2012 the following agents were traced in surface water bodies: suspended substances – 4.82 thousand tons, dried residues – 83.79 thousand tons, sulfate anion – 9.01 thousand tones, chlorides – 11,73 thousand tones, ammonium nitrogen – 517.31 tones, nitrate anion – 18,601.54 tones, zinc – 5.77 tones, aluminum – 11.59 tones. [Okhrana okruzhayushchei sredy v Novosibirskoi oblasti. Statisticheskii sbornik (Environment protection in Novosibirsk oblast. Statistics digest) / Novosibirskstat. – Novosibirsk, 2012. – p. 94 (in Russian)] It should be noted, that comparatively low water temperature in rivers and water bodies weakens their self-purification capacity.

Water resources condition is influenced by wearing away of river banks as a result of their underwater parts erosion (mainly resulting in exclusion of agricultural lands and residential areas from economic turnover) and accumulation of polluting substances in bottom deposits. The problem of silting-up of Ob water reservoir and reduction of its effective capacity due to the banks caving is a pressing one and requires solution. The reservoir water-front is 500km long. Around 50% of the waterline is being eroded. Two socially important projects of coast-protection structures construction on the right bank of water reservoir (in Iskitim district of Novosibirsk Oblast) were developed as part of target federal program “Development of water resources utilization system of Russia in 2012–2020”. For the first time in the last 20 years large bank protection facilities will be build in Bystrovka and Sosnovka settlements by 2015. Their construction costs will be over 300 mil-

lion rubles. According to experts this will prevent the damage of 1.4 billion rubles which can be caused by loss of land and woods, the water reservoir silting and negative ecologic consequences as the result of water body banks erosion in thickly settled coastal area.

LOW QUALITY OF DRINKING WATER

River flow and underground waters are the main sources of drinking water supply. Water supply of large cities (Novosibirsk, Berdsk, and others) with no sufficiently protected reserved sources of water supply is developed on surface sources. The quality of surface water is unsatisfactory. Since it is polluted, water taken out of the Ob River requires preliminary integrated water treatment and disinfection.

Now the most part of the Novosibirsk oblast have to use water inconsistent by several criteria with hygiene requirements. The deficit (and sometimes the lack) of water treatment facilities together with inefficient water treatment technology do not allow to ensure compliance of water quality with regulatory requirements thus creating a serious threat to public health. The enterprises which bottle drinking water in Novosibirsk slightly reduce the urgency of the problem.

For a number of years Novosibirsk regional authorities attempt to solve the problem of drinking water quality. The program “Provision of the population of Novosibirsk Oblast with drinking water in 2000–2010” was developed and approved in the beginning of 1999. During the program development the quality of water in the oblast districts was taken into consideration. According to water quality the necessary modular cleansing systems were selected for each settlement. It was planned to provide each resident with 5 liters of drinking water per 24 hours due to the high cost of water treatment.

Just a downsized version of the program was actually implemented – regional program “Provision of Novosibirsk oblast population with drinking water in 2008–2012”. Activities aimed at water quality improvement were downsized, and main efforts were concentrated on drilling new wells and pipelining. The issue of water quality was not cardinally resolved due to either the shortage of capacities for water treatment or lack of such stations in small settlements.

Today the majority of the Novosibirsk Oblast residents drink water hazardous to their health. Among 30 districts only in one, Iskitim district, quality criteria of underground drinking water were estimated to be safe. In 23 districts underground sources of drinking water contain elevated concentrations of mineral salts and metal ions. The underground waters requiring purification are located in the following territories: Ust Tarka, Chany, Vengerovo, Chistoozersk, Karasuk, Kupinsk and Kuibyshev districts. [Kronikh G. Zhiteli piyut opasnuyu vodu (Residents drink dangerous water) in Russian. / URL: <http://www.nsk.aif.ru/society/article/30055> last accessed date 02.03.2013)].

In 2013 the financing of the program “Clear Water”, which provide the development and reconstruction of water supply and water disposal systems in municipalities, was downsized due to the budget deficit (14.9% of its own revenue) in 13 districts of the Novosibirsk Oblast. The situation worsened because not all districts prepared design-cost documents in order to receive budget support. After setting up priorities – calculations come first, then – money the regional government found an opportunity to implement the social important program at the expense of several funding sources.

The amendments to the budget for increase in appropriations enabled the districts to receive necessary amount of financing. The issue of settlement’s water supply is a priority. “Clear water” program costs for 2014, 2015, and 2016 will be correspondingly 382, 90.8

and 200.7 million rubles. The program is developed on the basis of the requests and projects provided by municipalities.

Novosibirsk and Berdsk citizens are provided with good quality water from the Ob River. In Novosibirsk water supply is provided by five pumping and filtering stations of “Gorvodokanal”. Processing and disinfection of drinking water is based on the classic technological schema. It should be noted that chloride content standard in Russian drinking water is 2.5 times higher than in USA, and 12 times higher than in West Europe. During chemical treatment chloroorganics are formed in the water and many of them are deemed to be cancerogenic. For example, specialists from American oncological institute and Finnish scientists concluded that 2% of liver and kidneys cancer occurs “thanks to” chloroform. Solution in this case can be seen in refusal to use chlorinated water and in switching to other types of its processing. Novosibirsk “Gorvodokanal” gradually reduces volumes of chlorine used during water processing. In two out of five pumping and filtering stations ultraviolet drinking water disinfection units are already operating.

THE OB BASIN IS THE LARGEST FOCUS OF OPISTHORCHIASIS IN RUSSIA AND IN THE WORLD

According to World Health Organization, one third of infectious, noncontagious and parasitic diseases among population are connected with water factor. Microbiological contamination of water (bacteria, viruses, parasites) leads to fish contamination. Ob basin is characterized by extremely high level of infection of West Siberian residents and approximately 30 types of wild animals. Almost all population in small settlements, located along river basins, is infected with opisthorchiasis (the fish there is the main food). According to research of the Institute of Medical Parasitology and Tropical Medicine of E.I. Martynovskiy, at the end of 1970s 4.4% of the population was infected with opisthorchiasis. Today infection rate among residents of the Middle Ob basin is dangerously high, it reaches 51-82%, and in some districts it exceeds 90%.

Epidemiological situation with opisthorchiasis in the Novosibirsk Oblast is not improving, despite of the work conducted by parasitologists and other kind of doctors and preventive measures taken for a number of years. If average national level of incidence is 28–30 infected persons per 100 thousand residents, then at the north of the Novosibirsk Oblast it equals to 800–900 infected persons per 100 thousand residents.

HAZARD OF HOUSEHOLD MERCURY CONTAMINATION OF WATER IN OB RIVER

As consistent with the Energy Saving Law in 2014 Russian citizens should switch to using energy saving bulbs which contain mercury. According to the existing estimates the Novosibirsk residents purchase annually 10kg of mercury in the form of these bulbs. In 2014 these purchase volumes might grow up to 50–100kg. It is quite possible that ultimately mercury will enter the Ob River, and then – in fish. It is known that mercury concentration in fish is 100 times higher than in the water this fish lives in. Mercury which contaminates human organism through fish and which accumulates there causes severe damage: liver and gall bladder are diseased, proneness to tuberculosis, atherosclerotic vascular disease, and hypertension occurs, central nervous system is also damaged.

Mercury bulbs disposal is prohibited at general purpose polygons. And the problem of their disposal remains urgent. The working conditions of Novosibirsk companies specializ-

ing in recycling mercury-containing bulbs do not stimulate residents to return waste lamps to them. For example, there are companies which accept waste bulbs only in packets (50 units each), and sum of money to be paid for each lamp is quite significant for majority of city residents. It is easier for people just to throw these bulbs in garbage disposer, from where the bulbs will be transported to area landfill, and from there – into ground and underground waters. The disinfection of underground waters is a costly process.

A movable station of mercury containing wastes “Ekomobil” started to operate in Novosibirsk as part of the target program “Development of production and consumption waste management system in the Novosibirsk Oblast in 2012–2016”. Two cars were able to collect around 300 mercury bulbs, as well as accumulators and batteries. Three more ecomobiles were also purchased for the city on budget funds. This will allow city residents to bring mercury bulbs, thermometers and other gadgets, equipment and devices containing mercury which lost consumer attributes, return for utilization near their houses (without throwing them into garbage disposal containers) on regular basis and free of charge.

The investors do not go into garbage recycling sphere because it is characterized by high capital intensity and long payback periods of projects (construction of concrete storages for mercury waste). Allocation of budget funds will be required. The problem of energy efficiency by means of switching to mercury bulbs should be solved simultaneously with the problem of their disposal. [Paschenko S. Rtut’ v okeane. Nashi reki stanut prichinoi mezhdunarodnogo skandala? (Mercury in the ocean. Will our rivers cause an international scandal? / Argumenty i facty. June 6, 2012 (in Russian)].

Under the influence of natural and climatic factors and anthropogenic activities the urgency of water economic issues remains. And in some cases it constantly grows despite undertaken efforts towards their solution. Development and implementation of complex measures aimed at preservation of natural environment and water supply for social and economic development of the Novosibirsk Oblast is necessary in long-term perspective.