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COMMUNITY AGAINST INDUSTRIAL POLLUTION OF VORONEZH RIVER BASIN BY CHEMICAL COMPOUNDS : ACTIONS AND ACHIEVEMENTS

Voronezh is a river in the Central Chernozem Region of Russia, a left tributary of the Don River. The Voronezh River is 342 kilometres in length. The area of its basin is 21,600 square kilometres. It freezes up in the first half of December and stays under the ice until late March. The lower reaches of the river are navigable. The cities of Voronezh and Lipetsk are located on the Voronezh River. There are 28 tributaries of the Voronezh River in its basin (Ilovay, Stanovaya Rjasa, Matyra, Usman are the most significant). There are 488 surface water bodies in the Voronezh River Basin with the general length of river system of 4,645 kilometres.

Many countries continue putting into commission new chemical enterprises and expanding already working ones. This leads to the chemical pollution of the environment in the industrial zone and adjoining area by numerous toxic compounds. This is a particular in the Voronezh River Basin (Central Chernozem Region of Russia), due to the pollution created by such large-scale industrial enterprises as Voronezhsynthezkauchuk, Novolipetsk Metallurgical Works, Rossosh Mineral Fertilizers Plant, Voronezh Tyres Plant. Within the Voronezh River Basin there are 29 chemical and petrochemical companies. In 2003, water pollution caused by these companies was observed in the city of Voronezh and in 15 districts of the Voronezh Region. In the Voronezh Region, 261.0 thousand people live in conditions of polluted water. The environmental degradation in the Voronezh River Basin has induced public instability, raised conflicts that can’t be settled for a long time. Community activists and local social organizations are promoting the broad spectrum of activities against chemical pollution of the Voronezh River Basin such as establishing the Center for Ecologic Adversity Counteraction; lectures and seminars in the Central Chernozem Region of Russia

on industrial pollution of the Voronezh River Basin; local TV and newspapers campaign devoted to conservation of the Voronezh River; implementing the effective system of medical monitoring of population in the districts with polluted water; establishing the independent water quality research laboratory; empowering local democratic institutions in environmental field; study the new sources of chemical pollution in the Voronezh River Basin.

- The Centre for Ecologic Adversity Counteraction.

This Centre is a non-government establishment rendering legal, medical, and information assistance. The chemists, biologists, physicians, journalists, lawyers are participating in the actions of the Centre as volunteers.

- The lectures and seminars in the Central Chernozem Region of Russia.

These lectures and seminars are intended for representatives of local communities and local authority bodies, as well as school children, and students. The purpose of this activity is to attract the public attention to the problem of ecology calamity in Voronezh River Basin.

- Local TV and newspapers campaign devoted to conservation of the Voronezh River.

The distinctive features of the mass media dealing with environmental issues are as follows:

1) The mass media represent the dominant source of environmental information for different social actors, and thus play the major role in public environmental awareness and public opinion formation. The persistent gap between the expert view and public opinion can be amplified or reduced through mass media activities.
2) Environmental risk communication in society are carried out mainly through mass media activities. Information flow and transfer have no linear character from source to recipients but a rather complex construction in which interactions between recipients play visible and important roles.
3) The exceptional role of the mass media in social learning about environmental risks is in reporting and information dissemination among

social actors. Moreover, the press provides continuing learning for the public on environmental matters.

The mass media can play a special role in the societal environmental mobilization by exposing different visions and data on environmental situations, initiating public debate on the environment, contributing to the problem-solving process, and, what is most important, creating a basis for societal consensus on these issues. The mass media would thus fulfill its social role and responsibility. The mass media efficiency depends on a certain set of criteria. Among those are:

1) The degree of mass media concern and interest in environmental matters;
2) The civil responsibility and position of journalists;
3) The inclusion of viewpoints of all social groups in discussions concerning environmental issues;
4) The use of systematic approaches to the coverage of environmental issues;
5) The development of journalistic skills necessary to make understandable complex issues in press coverage;
6) The inclusion of ethic principles in press coverage.

Currently the mass media, through its communicative tools, provides an exceptional chance to take public decisions based on social consensus and compromise. Bringing more participants into the decisionmaking process; comparing different outlooks and arguments; accumulating different knowledge and experience are the ways mass media contributes to the comprehensibility and efficiency of these decisions, and facilitate their implementation.

- The effective system of medical monitoring of population in the districts with polluted water.

The present work was carried out at the organic synthesis enterprise of the Joint-Stock Company Voronezhsynthezkauchuk.

To pick out industrial units and neighbouring areas with higher content of toxic substances in the sewage the comparative test of the data of the State Sanitary and Epidemiological Inspection was conducted.

The groups with the largest risk of gaining different pathological changes among the workers and those who live in the adjoining area were defined. The expert assessement method was applied. It gave the chance to single out the main risk factors of appearing the diseases and to appraise their indices quantitatively. This allowed to make the special questionnaires for the workers and the inhabitants of the near-by area.

The part of the plant staff and the part of the population living near the plant (first of all in the territories with the most polluted water) were asked necessary questions in the ready made form to determine the risk groups. The number of interrogated people was enough to get the trustworthy statistic data.

When the computer database was created the number of points characterizing the patients' state of health (taking into account the revealed priorities of certain factors in the development of diseases) was automatically calculated. Those who took a certain number of points form the groups requiring immediate, scheduled or preventive diagnostic procedures.

Screening medical examination included objective inspection, laboratory research (full-scale general blood test, biochemical testing complex), endoscopic investigations and ultrasound testing of the internal organs.

The analysis of the data obtained showed that there were much more patients with various diseases among people from the highest risk group than in other groups. Early identification of different diseases enabled to conduct successful treatment in time.

- Establishing the independent water quality research laboratory.

This allows to monitor the official data on the level of chemical compounds in the Voronezh River. Also the data of independent water quality research laboratory help to solve the conflicts between region authorities and local community.

- Empowering local democratic institutions in environmental field.

The community activists carried out a citizens conference devoted to various aspects of chemical pollution of water bodies in the Voronezh River Basin. Also they initiated the adoption of the local law on the ecological police in the Voronezh Region. Due to community efforts the local Public Council on Environmental Issues was established. The water bodies' conservation is an important field of its activity.

- Study the new sources of chemical pollution in the Voronezh River Basin.

It is a continuing process because there arise numerous pollution sources in industrial and agricultural sectors as well as in everyday life, such as

- new plants;
- new farms;
- landfills;
- car washes;
- oil pipelines etc

Organic Synthesis enterprises are the most significant sources of chemical pollution of the Voronezh River.

Processing of initial raw materials and production of synthetic rubbers at the plants of this sector in Russia involve daily consumption of over 1 million m^3 of fresh water; disposal of 335 thousand m^3 of wastewater, containing up to 500 tons of organic and mineral pollutants to the treatment facilities; formation of considerable amounts of solid, liquid and polymer wastes and air emissions, containing up to 250 tons of hydrocarbons. A number of pollutants are removed in the course of treatment or otherwise are processed at the local and biological treatment plants, plants for catalytic afterburning of gas emissions, and waste processing plants. However, substantial quantities of pollutants still remain after treatment.

OAO Voronezhsynthezkauchuk is the company that has the important influence on the water bodies in the Voronezh River Basin. The plant is involved in the production of stereospecific and emulsion synthetic rubbers and commercial

lattices. The company's technological processes produce sewage, that contain 89 chemicals.

To investigate and evaluate health hazard of water pollution caused by wastes from point pollution sources of OAO Voronezhsynthezkauchuk, the State Sanitary and Epidemic Inspection Center in the Voronezh Region, using the inventory data, determined 25 priority pollutants out of 89 mentioned above. These priority pollutants include lead and compounds thereof, nitrogen oxide and dioxide, sulfur dioxide, carbon dioxide, 1,3-butadiene, benzene, styrene, trichloroethane, phenol, formaldehyde, acrylonitrile and suspended substances.

According to the results of analyses carried out at the laboratory of the State Sanitary and Epidemic Inspection Center in the Voronezh Region and at the independent water quality research laboratory, maximum allowable concentration levels for the priority pollutants in the water bodies were exceeded on a regular basis.

To considerably improve the ecological situation of organic material production (specifically at OAO Voronezhsynthezkauchuk) it is necessary to undertake the following actions:

1. All plants of this sector should carry out certification of wastewaters, gas emissions, and production wastes and make comparative analyses to find out whether actual amounts of emissions and wastewaters conform to maximum permissible emission and maximum permissible concentration levels.
2. Revise the current norms in all areas of production, including treatment facilities, and make the necessary amendments and changes to meet maximum permissible emission and maximum permissible concentration levels and provide for the reduction and utilization of wastes.
3. Completely stop using biologically non-oxidizable ingredients in rubber, latex, and other processes, introduce into practice fundamentally new processes of salt-free emulsion rubber recovery and production of oligomer-free stereospecific rubbers and thermoplastic elastomers.

4. Improve monomer production technologies in order to ensure trapping of hydrocarbons from air emissions and their catalytic removal.
5. Introduce the latest achievements and physicochemical water treatment methods at the stage of basic tertiary wastewater treatment using ozone before water disposal into the water bodies, to meet current sanitary norms and regulations.

The conservation of water bodies and soil is a significant and many-sided problem in the Central Chernozem Region of Russia. We consider the community efforts in environmental field as the key point for maintaining the ecological balance in the Voronezh River Basin for a long period.