

APPROACHES TO INTEGRATED ENVIRONMENTAL AND INDUSTRIAL MANAGEMENT IN RUSSIA FOR SUSTAINABLE DEVELOPMENT ^{*)}

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This paper discusses issues of integrated environmental and industrial policies in Russia through changes towards environment friendly economics, institutions, production and consumption patterns, and life-styles. Sustainable industrial development perspectives are analysed in the context of current Russian environmental situation and economic tendencies, as well as within a broad international network.

Introduction

The World Commission on Environment and Development ('the Brundtland Commission') devoted a special chapter in its report 'Our Common Future' to the concept of sustainable industrial development (Our Common Future, 1987). This approach is of universal significance relevant to developed and developing nations as well as the so-called the countries in transition to a market economy.

The present development pattern in many industrialized nations is somewhat similar to a kind of 'environmental oases'. It has resulted from solving many local - first generation - environmental problems while environmentally unsound activity (or waste) is often pushed away (externalized) elsewhere - downwind, downstream or through trade. A NIMBY (not-in-my-backyard) attitude also contributed to regional and global ecological problems as well as dwarfed efforts towards integrated industrial and environmental management at the international level. Most of those problems are of industrial origin.

In fact, it is widely recognized that the human dimension of environmental change is mainly resulted from two factors: technological (that fuels increasing per capita resource consumption and waste production in developed and often in developing countries) and demographic (population growth in developing nations) (ASCEND 21, 1991)

A number of issues are debated in publications about the integration of economic (industrial) and environmental policies (EIP integration).

Technologies are the centerpiece of industrialization. Industrial activity continues and will continue well into the future, being one of the single most important factors in ensuring economic development and growth of many countries. It is evident that industry will have to assume an

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increasingly important role in protecting the environment, in taking its own initiatives to mitigate the adverse effects of its activities on the environment and in assuming the lion's share of responsibility for investing in environmentally sound activities (UNECE, 1995).

The first issue is the appropriateness of an EIP integration for Russia.

It is sometimes argued that people can afford to deal with the quality of the environment as their wages and living standards are raised, and needs in food, clothing, housing are met, i.e. when an accumulation of capital is achieved for savings to be directed to the environmental field. The present life looks relatively secure and people can think about the future. In the USA, for example, wealthy estate owners call for stricter environmental regulations. That is why ecological problems are not priority items for the poor. The conclusion is made that the correlation between rising incomes and the concern over the environment is valid not only for social groups but also for different countries. Japan is viewed as an example of a country that turned into a world economic power between 1973 and 1984 and at that time took measures to address its environmental issues. A different situation is cited in developing countries struggling with poverty and famine and, therefore, devoting less time and effort to combat environmental problems (W.Reilly, 1991).

On the other hand, there are views that economic crisis in developing countries, increasingly labeled a 'debt crisis', is often an environmental crisis. It is pointed out that the International Monetary Fund rushed south with programs to stabilize the monetary situation, but nobody spoke of stabilizing the natural resource base. Yet, throughout the 1980s, the depreciation of natural resource assets, as an annual percentage of GDP, dwarfed the balance-of-payment deficit. The difference was that the balance-of-payment deficit was recorded, transparent, and scrutinized. The documentation of domestic assets went unrecorded, unnoticed, and uncorrected (Accounts Overdue, 1991). Russia seems to qualify for these both factors, with environmental concerns rated after economic hardships, crime, and corruption in government, on the one hand, and a heavy pressure from the World Bank and other financial donors to check the inflation and narrow down a state budget deficit as a precondition for loans on the other.

The recent trend towards a growing openness, internationalization and globalization of national economies in which environmental concerns play a conspicuous role as well as burgeoning international environmental conventions with liability clauses have become exogenous factors that spur an integration of environmental and industrial policies.

The second issue deals with efficient societal (control-and-command/closed vs. market/open/democratic) management to address industry-related environmental problems.

It may seem paradoxical that both market and centrally planned economies in their industrial development gave rise to massive environmental degradation. One can attribute this phenomenon to the fact that they both pursued development and competition between them based on an economic (industrial) and military growth paradigm. That was an extensive, nature-ravaging kind of development. Natural assimilating capacity and resources (environmental services and goods) were considered mainly free and practically inexhaustible, with an unlimited capability of technological 'progress' to solve any emerging problems.

Market economies generated environmental losses due to 'market failures' that appeared in the form of widespread pollution externalities, widespread abuse of commons and negative intergenerational transfers (J.Cumberland. 1991). Technological change has largely been driven by profit motives of private companies, with environmental effects seen as externalities and their

burden shouldered by human community at large. Government stepped in to address externalities and other problems with regulatory mechanisms. The international community got involved to deal with international and global environmental issues outside the capacity of individual governments and to coordinate as well as harmonize their efforts.

In addition to the economic growth paradigm, similar to western societies, the USSR and its allies had an additional, ideological goal 'to catch up with and overtake the West' as well as become self-reliant. Much hope was placed on the achievement of military superiority. All that was done 'at whatever cost', social and environmental, using central-planning control-and-command management. Many economic and environmental setbacks were kept hidden (such as Chelyabinsk - in 1957 and Chernobyl in 1986) and are often now shrouded in puzzled statistics. Although many advanced environmentally sound solutions were even encouraged at the top, they were often bogged down in ministerial "red tape" since they distracted from or delayed the attainment of economic targets. That was why international decisions and resolutions in the environment areas adopted with the USSR's participation did not practically contribute to the improvement of environmental situation in the country (R.Perelet, 1988).

Many environmental principles became useless under the overwhelming domination of state property, e.g. both a factory and a neighboring state farm polluted by the former were government-owned in the USSR and other East European countries, i.e. there were practically no externalities. Government had no economic instruments to act and change technology. By imposing a fine on the factory it, in fact, took its own money from one pocket (or a budget line) and put it into another within the same total amount. However, even this action was not popular since in the absence of competitive factories the fine could affect the factory's production targets set by the same government and, thus, disrupt links in the whole industrial branch.

The latest democratic and market-oriented changes in the former USSR and Eastern Europe have led to a search for new economic tools and the development of new approaches to integrated economic and environmental development in Russia.

The third issue is the current state of industrial development in Russia.

A falling industrial output and underutilized production capacity since 1989 have led to decreasing environmental pollution and concern. However, pollution per unit of industrial output has risen; the industrial and technological crisis has resulted in a sharp upsurge of industrial accidents with acute environmental and human health problems; the legacy of past severe pollution has spread over a huge territory affecting millions of people; a drive for hard currency often coupled with lax government control has brought hazardous, toxic and even radioactive waste to Russia from a broad for disposal or processing. Russian copious nonrenewable natural resources are being depleted for exports to earn hard currency; nature reserves stripped of government budget subsidies are also in a deep crisis and can hardly be called nature protected areas, thus affecting pharmaceutical and agricultural seed stock industries.

Those and other factors urge an integration of environmental and industrial policies. Among those 'other' factors is, in particular, Russia's international commitments such as those relating to the Rio conference's final documents and calling for a transition to sustainable development.

The fourth issue deals with directions of EIP integration.

In the circumstances it is considered that urgent measures should be taken to alleviate the pressure, both overall and per unit of consumption, of industries on the environment. This can be achieved through structural changes in economy resulting in establishing new resource-efficient

industries, closing down heavily resource-intensive and resource dependent enterprises, environmentally sound retooling of obsolete enterprises, adding environmental controls, production of environmentally safe products (V. Danilov-Danilian, 1995).

The industrialization process proper affects the environment in several ways at:

- the input preparation and makeup stage through the depletion, destruction or transformation of the natural resource base, lands, and soils to obtain its raw materials;
- the manufacturing (processing) stage through environmental pollution by environmentally unsound technologies;
- the product use stage (maintenance and repair);
- the product after-use stage through generating waste with its attendant problems of its disposal (re-use, recycling, etc.).

In addition, industries cannot exist without a huge infrastructure: energy, transportation, communication and distribution systems, water and air supplies, human settlement patterns, human life style patterns. UNEP recently emphasized that environmental problems are the consequence of social processes: equity, development and care for nature and natural resources are factors so intertwined that they can only be analyzed and managed in an integrated manner (UNEP, 1995)

Russia and Sustainable Industrial Development

Over the 1970s-90s, the world featured a sevenfold growth in output of goods and a threefold increase in mineral production. However, the growth was uneven among countries. For example, a share of industry in GDP for low-income nations rose from 28% in 1965 to 37% in 1989, while middle-income countries saw an increase from 34% to 36% and developed market economies brought it down from 42% to 35% over the same period. The share of developing nations in the world manufacturing output remained at about 12.7% during 1980-85, however it slightly rose to about 14% by 1990. They are confronted with such problems as a growing burden of foreign debt servicing, fleeing capital, protectionism limiting access markets in developed countries and the pressure of meeting increasing needs of their own population (UNEP, 1992).

Russia of the mid-1990s experiences a similar kind of problems in a world of computer-aided design and manufacturing, microelectronics, information technologies, new materials and biotechnologies, modernizing traditional industries such as textile and pulp and paper.

The overall use of metals have grown in the world over the last two decades. Most of them are mined in developing countries for export to developed economies (only 12% are consumed in the former). Mineral ore mining is usually extremely polluting for water and the air leaving behind damaged soils. The US mining experience led to huge areas of barren lands and a similar picture can be seen in many developing countries.

There is a trend to change to non-ore materials in order to bring down the weight of final products and energy costs. However, with some environmental problems diminishing, new, sometimes more serious, ones emerge connected with human health impairment because of the use of toxic chemicals in processing semiconductors, optic fibers, ceramics and composites, and with the disposal of new products.

Air pollution may be contained in the future because of higher energy prices and investment in new capital equipment with better environmental controls. In 1989, OECD countries accounted for 25% of NO_x, 40-45% of SO_x and 50% of all 'greenhouse' gas emissions in the air, 68% of all and 90% of hazardous waste in the world (UNEP, 1992, para.12.10).

Water use in industry is expected to grow almost twofold from 1970 to 2000 reaching about 25% of all drinking water consumption in the world, even given multiple (up to 17 cycles) water reuse before discharging. The balance of industrial emissions is expected to shift towards water pollution and away from air pollution because of a faster projected growth of such water polluting sectors as food-processing, wood products, paper and chemical industries. In addition, municipal sewage discharges should increase with the development of small industries and services in urban areas.

For many manufacturing sectors, it is the combustion of fuels to generate energy, heat, steam or other power which has the biggest impact on the environment. In 1990, industry used 37% of all world commercial energy consumption, with the disparity between 33% in OECD countries and 60% in Eastern Europe. The difference is usually explained by the use of obsolete equipment and technologies and state subsidy injections in the latter. In general energy efficiency in the countries in transition is twice as low as in the market economies in the west, because of inefficient energy use, unnecessary energy and heat loss (UNECE, 1995).

While environmental regulations in industry were mainly focused on large factories or industrial complexes which were easier controlled by authorities, a host of small businesses, especially in developing countries, cause much environmental pollution and need special attention.

Pollution and waste problems are still often addressed by developed countries through transboundary movement of waste or by closing not only mining industries (that process is practically completed, e.g. 78% of Russia exports are raw materials with about 40% going to OECD countries) but also transferring manufacturing industries to less developed countries with financial and R&D control remained in the developed economies or parent TNCs. The post-industrial and information societies are now struggling with new generations of hazardous, toxic, radioactive (hitherto neglected and left to chance) as well as biotechnological waste pollution.

In fact, a waste index of a nation measured as a ratio of all household wastes to overall waste produced by society, which reflects a level of personal consumption and the household/community orientation of a national economy, ranges from 0.23 for USA and France to 0.26 for Germany and UK, to 0.19 for Japan (many raw materials are imported) and to a mere 0.025 for the former USSR. This index shows a high inefficiency of natural resource use as well as a low productivity in a heavily centralized and militarized economy of the USSR ('Izvestia', 1995).

Still, both kinds of industrial waste are to be addressed. Waste generated as a result of manufacturing processes can increase in Russia because of waste intensity of industrial production. Used consumer goods and products are growing in volume now that many of them (over 50%) are imported to Russia. As a remedial action, efforts should be taken pay far more attention to improving process technology, product design, packaging and distribution.

The increasing role of automobile transportation for the movement of people and goods should lead to greater air, soil and water pollution along motor roads. That should call for producing fewer polluting automobiles or changing the transportation structure (more public transport, fewer motor vehicles, more environmentally sound traffic patterns, etc.).

The largest part of Russian exports is associated with leaving behind pollution and waste: 78% of the Russian export now is made up of raw materials and another 15% of machine tools and chemical products (Kommersant-Daily, 1995). Attempts to introduce more science/information intensive industries may lead to more hazardous and toxic waste while attempts to expand nuclear power sector can be wrought with new problems of nuclear waste treatment and disposal.

Russia definitely needs a better framework of legislation and regulatory authorities, property rights, corporate and non-corporate law, financial institutions, a well developed industrial infrastructure.

The elaboration of a new law on natural environment and a new set of environmental standards that is now under way is considered extremely important to integrate environmental and socio-economic policies (A.Averchenkov. 1995).

A large territory of Russia and its regional environmental, economic and social specifics makes it imperative to take them into account in developing an integration of environmental and industrial policy (Feshbach, M., 1995).

The life-cycle management approach gaining ground in the developed world fuels this attitude. An environmental product declaration in Sweden, a similar system in Japan (UN ECE, 1989), the spread of eco-labelling are just examples of the trend. Russia is also establishing an eco-certification system.

Case History: Eco-Certification in Russia for Greening Industries

A new Federal sub-program on a Federal system of environmental certification is to be adopted shortly in 1995. It started with parliamentary hearings in March 1993 at which that program was recommended to be worked out as a priority activity.

In March 1993 the RF Government adopted an ordinance “On the safety certification of defense-related industrial and R&D enterprises utilizing environmentally hazardous and explosive technologies”. After that the ministry of environmental protection, state committee for standards and state committee for defense industries signed an agreement that specified major areas and principles of interrelationships in the area. In September 1993, the RF Ministry of Economy included the sub-program as the one to be allocated appropriations within the Federal program “Environmental Safety in Russia”. In December 1993, the board of the RF Ministry of Environmental Protection approved major directions of the sub-program. In addition, it was decided that the international cooperation in this area should be encouraged. Such cooperation was started with some German and US firms.

In June 1994 the RF Government issued an ordinance on “Procedures for issuing licenses for the development and production of weapons, military products and ammunitions”. In compliance with an agreement between the ministry of environmental protection and the state committee for defense industry an order was issued in December 1994 on interim procedures for issuing statements on environmental safety compliance of defense enterprises. In January 1995 an order was signed on the establishment of an environmental certification system for Russia which heralded the setting up of a new direction in environmental protection management. This system envisages the use of economic and market-related instruments to encourage the competitiveness of products and services it is aimed at. Then, documents were prepared to officially register a voluntary environmental certification, mainly for non-defense enterprises, and the work started to prepare similar documents for an obligatory certification of defense industrial enterprises. In addition, interregional conferences were organized to involve Russian regions in this process. In

some of them work on environmental certification had been initiated and experiments with its application are envisaged. The environmental certification will also be required for imported products, technologies, waste and services.

It aims primarily at achieving eco-efficiency of industry, at development and application of environmentally sound technological processes and equipment, as well as products taking into account the complete product life-cycle. The above program should also contribute to integrating Russia with the world market and meeting its international commitments. The program includes the preparation of a federal law on ecocertification and also includes measures for education and training in eco-certification.

The eco-certification system also envisages that the environmental protection ministry would be the federal eco-certification body in Russia that would be responsible for the national eco-certification policy have appropriate scientific, laboratory, computerized data banks and other facilities as well as environmental auditing. The eco-certification program should be completed in the year 2000 would need 40 bill roubles (1994), or about USD 8 bill, to be sought from the federal budget (20%), regional government budgets (20%), the federal environmental fund (9%), regional environmental funds (8,5%) and business community (11,5%). The program was initiated by the scientific research center of environmental safety under the ministry of environmental protection.

Economic Instruments for Integration of Environmental and Industrial Policies

One of the most crucial and difficult issues to be tackled in Russia concerns liability for clean-up of industrial sites contaminated in the past.

Integration of environmental and industrial policies in Russia takes place through the development and application of economic instruments such as charges for emissions and discharges of pollutants, disposal of waste into the environment. Problems encountered included the determination of adequate rates of charges taking into account inflation, regional, local and sectoral factors. In 1993, new types of charges were introduced such as charges for thermal pollution and noise, liability in the case of accidents.

Environmental auditing and rehabilitation of industrial enterprises to be privatized were introduced in 1993. Voluntary and mandatory environmental insurance schemes for industries were also elaborated in 1993. In addition, economic mechanisms at the input end to stimulate environmentally sustainable industrial development were discussed in 1994-1995, such as the greening of taxes and establishing a system of charges for the use of natural resources. They were overshadowed by discussions in parliament of a new draft law on taxes.

The idea of an environmental tax reform is to put the tax burden on resource use and pollution and simultaneously remove equivalent tax burdens from the more desirable production factors - labor and capital. The overall tax burden is meant to remain constant. Charges always increase the overall burden, taxes need not. This is the reason why environmental taxes easily can be ten or even fifteen times as high as charges (Weizsaecker, E. von, 1990). One of the arguments in favor of environmentalization of taxes is that at present taxes are imposed for 'goods', such as labor (while there is unemployment), and scarce capital. It would be wiser to put taxes on 'bads' such as activities leading to environmental degradation. Nowadays, taxes level out extreme social disparities among the rich and the poor and are imposed on income from environmentally sound and environmentally unsound activities. In the case of ecotaxes the income of the population will,

hopefully, be 'environmentally clean'. The introduction of international (carbon) taxes is now discussed among measures to address the global climate change.

In the meantime, taxes at the national level are emerging as an important policy option for reducing environmental damage. In 1990, Sweden imposed a USD 5 value-added tax on each kilogram of sulfur emitted in industrial activities. In 1989, Italy introduced taxes on plastic bags and proposed to extend such taxes to other commodities. Other European countries such as France, Switzerland, Germany, Ireland, Belgium and the UK have produced plans to introduce and broaden the scope of 'green taxes' (Anon, 1991). The use of 'green taxes' in the developing nations presents difficulties, since it requires appropriate institutional mechanisms. In most developing countries, taxes are either punitive or confiscatory. The main focus of 'green' taxes, however, has been to alter behavior by changing the internal cost structure of individual firms instead of sanctioning polluters. At the policy level, such taxes are not likely to be effective unless they are formulated in the context of broader national environmental management plans.

In 1993, the Russian state customs committee turned down a proposal of the ministry of environmental protection to exempt or alleviate customs duties for import and export of goods directly related to environmental protection. However, efforts in this direction will be further pursued (RF State Report on the State of the Environment in 1993 (1994).

Environmentally Sound Industrial Policy

Environmentally sound industrial policy should be aimed at industrial development rather than solely at industrial growth. In fact, industrial growth indicators should be environmentally adjusted. At the goal setting stage efforts can be made to promote changes in lifestyles and consumption patterns by making environmentally benign products as well as by encouraging investments accordingly so that they could urge environmentally safe technological change.

The environmental constraints to an industrial activity can be taken into account at the planning stage by appropriately valuing (pricing?) environmental resources affected by externalities and applying a combination of economic instruments and regulatory approaches.

So far, regulation has been the main instrument of environmental planning and management. Gradually, however, environmental regulation and standards are being supplemented by economic policy instruments which work through the market mechanism by influencing enterprise decisions in favor of environmentally sound production and consumption, allocating resources more efficiently, and by furthering industrial development (UNEP, 1991).

Technology assessment should necessarily include the EIA and consider regular functioning as well as effects of potential industrial accidents. The latter may be especially important for Russia in which technological change is now slow, labor discipline is low and technologies and equipment are old. In addition, the EIA of imported technologies, products and waste should be carefully made. Spatial (local, regional, transboundary and global) and temporal (including intergenerational) environmental impacts can be considered. EIA has been the pre-eminent tool of environmental decision-making at the project level.

Widespread and growing use of EIA has helped introduce environmental sensitivity in decision-making at the enterprise/project level. Yet the effectiveness of such assessments has been constrained by several factors, among them: their insufficient integration into socio-economic appraisal of projects, mainly on account of valuation problems; insufficient baseline environmental data; lack of provision for cumulative and synergistic assessment of impacts from a number of

sources within a given geographic area; lack of provision for assessing environmental impact of sectoral policies; lack of integration of risk assessment and of contingency planning; lack of monitoring equipment, facilities, expertise, and institutional capacity for implementation (UNEP, 1991). However, a wider use of computers and modeling in EIA and policy making can be appropriate to overcome some of these problems (Pegov, et al., 1991; Fedra, July 1991; Fedra, November 1991).

Geographical information systems are gradually making available area-specific data on natural resources and the environment. Such data, however, are not yet available in a form that can be related to indicators of economic well-being. In Russia, it is important not to lose and update data banks that were set up earlier.

The choice of environmentally sound siting of industrial activities is extremely important. The knowledge of the state of the environment in the chosen area by getting inputs from environmental monitoring (information) systems is necessary in order to know the remaining capacity of ecosystems to withstand industrial impact, to align industrial manufacturing and product cycles with natural, biogeochemical cycles (industrial metabolism) (Ayres, 1989) and with economic investment turnover cycles.

Industrial policy should also take into account its macro-economic impact on GDP (GNP). The latter should be duly adjusted to exclude costs of using polluting technologies and pollution clean-up costs, as well as losses of extracted renewable and exhaustible natural resources that diminish the environmental endowment (to obtain a 'green' GDP), employment (including environmental refugees from heavily polluted industrial areas), life expectancy, etc. This subject is now increasingly discussed in publications (Pearce et al., 1989; Costanza, 1991)

Conclusions

Integration of environmental considerations into industrial policy raises a fundamental issue concerning the type of sustainable development that is envisaged. It can be argued that it should be socio-environmental development with efficient economic and industrial policies to meet human needs (preferences). In this manner one can avoid putting too much emphasis on economic growth and industrial growth indicators, and place the major accent on social and environmental goals and values. In this context technological change and sustainable industrial policies become significant driving forces of socio-environmental development.

Internationally, industrial policies could be developed to achieve national environmental 'sufficiency' by improving the environmental situation in those countries where it is inadequate (using, for example, the critical load approach) rather than spoiling the remaining patches of sound environment in developing countries by bringing polluting industries there. Accordingly, a kind of international environmental 'parity' among countries could be sought in order to improve the state of the global environment (Perelet, 1991).

The above paper attempts to highlight major approaches to integrated environmental and industrial management in Russia within a broad international network.

The elaboration by UNEP, possibly in cooperation with UNIDO, a series of guidelines on integrated industrial and environmental policy for governmental industrial agencies or ministries, on the one hand, and for industrial projects, on the other, can be suggested. The former, e.g. 'Guidelines for integrated environmental and industrial management', may be prepared for various industries and include chapters on the state-of-the art in the subject area, a review of expected

environmental impacts of an industry for different technologies, manufacturing processes, products, disposal after use during specified functioning and in the case of accidents. Furthermore, it may also contain a description of environmental impact assessment, risk management techniques, economic instruments and regulatory approaches, as well as environment valuing techniques indicating their advantages and shortcomings for use in developing countries, calculations of a 'green' GDP (GNP), industrial development indicators, etc. Several case studies can be prepared for illustrative purposes.

The latter may be entitled 'How to make your industrial activity environmentally sound' and, along with a general simple language description of environmental considerations in industrial decision making, provide a checklist of factors to be taken into account.

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