

# **Final Report**

To the International Development Research Centre

## **Environmental Management Development in Ukraine And its Influence on Public Policy**

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## *Acronyms & Terminology*

### **Acronyms**

BEMIS	Basin Environmental Management Information System
CRA	Conestoga-Rovers & Associates
DEMIS	Dnipro Environmental Management Information System
DRF	Dnipro Renaissance Fund (later IDF)
EBRD	European Bank for Reconstruction and Development
EMDU	Environmental Management Development in Ukraine
GEF	Global Environment Facility
EMIS	Environmental Management Information System
IDF	International Dnipro Fund
MENR	Ministry of Ecology and Natural Resources of Ukraine
MEPNS	Ministry of Environment Protection and Nuclear Safety of Ukraine
MERTI	Municipal Economy Research and Technological Institute
NAU	National Agrarian University
OCEEI	The Office for Central and Eastern Europe Initiatives
REMIS	Regional Environmental Management Information System
UMC	Ukrainian Management Committee
UT1	Ukrainian TV (Channel 1)
Verhovna Rada	The Supreme Council of Ukraine

### **Terminology**

The following project management hierarchy terminology is used in this report. Program is used at the broadest level to mean the entire undertaking (both EMDU-1 and EMDU-2). Project is used to describe the level of concrete research.

*List of Interviewees*

Aliev, Kemal A.	Consultant to the Head (formerly, Deputy Head) of the State Committee on Water Economy, UMC member
Apatsky, Alexander N.	Deputy Minister of Natural Resources and Environment Protection, Belarus
Archipchuk, Viktor V.	Head of the Laboratory, Institute of Colloid Chemistry, Biotests' Project Manager
Bochko, A.V.	Head of the Department of Automized Systems of Management, Zaporizhia Vodokanal (Environmental Audits in Zaporizhia)
Bochkovska, A.I.	Institute of Geography, National Atlas Project Participant
Broide, Igor	Department Head of the Environmental Dept. of Zaporizhya City Council, Landfill Study Project Manager, Training of Environmental Entrepreneurs Project Participant
Chabaniuk, Viktor S.	Director of the Firm, "Intellectual Systems GEO", National Atlas Project Participant, Dnipro GIS Pilot Project Manager
Chebotko, Kostyantyn O.	Head of the Hydrochemistry Department, Ukrainian Scientific Research Institute on Melioration and Water Economy "Ukrvodproekt", Organomineral Fertilizer Production Project Manager)
Chervony, Anatoly E.	Head of the department, Boyarskaya Forest Experiment Station of NAU, Ramial Chipped Wood Project Manager
Dobrovolsky, Anatoly V.	Director of the Center of Ecological Audit and Green Technologies, Zaporizhia, Environmental Audits in Zaporizhia Project Manager
Golovin, Valery V.	Director of the Eco-Centre, Zaporizhia, REMIS Project Participant
Grytsenko, Anatoliy V.	First Deputy of the State Secretary <sup>i</sup> , MENR
Iskra, Igor	Project Liaison Officer, IDRC office, Kyiv
Katroha, Ivan M.	Deputy Head of the Jagotin Sugar Plant, Environmental Audits Project
Kolodiazhny, Olexander A.	Institute of Space Research, REMIS-DEMIS Project Scientific Leader
Lahola, Myron	IDRC Kyiv Office Director
Markevych, Lybomyr	the Global Environment Facility (GEF) Project Manager
Masurkevych, Olexander O.	Executive director of the ULRMC, the former head of the department of water resources, MEPNS, UMC member
Micheev, Nikolai N.	the former Deputy Minister of Natural Resources, Russia
Movchan, Natalya V.	Head of the Dnipro Department, MENR

Muchnik, Iosyp I.	Technical Director, Joint Stock “Experimental Mechanical Production Plant” (Environmental Audits in Zaporizhia Project)
Navrotsky, Vasyl M.	Head of the Dnipro Renaissance Foundation, UMC member, Ecological Audits’ Project Manager
Osadchy, Volodymyr I.	Director of the Ukrainian Research Hydrochemistry Institute (UHMI), Interdepartmental Database Project Manager
Pavlun, Jury I.	director of the TV studio “Eco-Dnipro”, Dnipropetrovsk (Raising Public Awareness of Environmental Problems and Environmental Television Program and Videos Project Manager)
Razguliaev, Volodymyr M.	Executive Director of the firm “Olexandra”, former head of Zaporizhia Vodokanal
Reznik, Eduard A.	Deputy Director of the Scientific Research Center, Russia
Romanenko, Viktor D.	Director of the Institute of Hydrobiology, UMC member
Rudenko, Leonid G.	Director of the Institute of Geography, National Atlas Project Manager
Semchuk, Grygory M.	First Deputy of the Head of the State Committee on Construction, Architecture, & Housing Policy, UMC member
Scherbina, Gennady P.	Director of the Municipal Economy Research and Technological Institute (MERTI), Drinking Water Law Project
Shevchuk, Vasyl Y.	the former Minister of Environment Protection and Nuclear Safety of Ukraine, the UMC Chairperson
Shmurak, Anatoly L.	Computer Department, MENR
Stashuk, Anatoly I.	the former Head of the Dnipro Problem Department at MEPNS, UMC Secretary
Trofimchuk, Olexander M.	Deputy Head of the Ukrainian Institute of Environment and Resources, REMIS-DEMIS Project Manager
Trofimova, Iryna	Deputy Program Manager, Canada-Ukraine Environmental Cooperation Program
Vasenko, Olexander G.	Deputy Director of the Ukrainian Scientific Research Institute of Ecological Problems, UMC member
Yatsyk, Anatoly V.	Director of the Ukrainian Scientific Research Institute of Water and Ecological Problems, UMC member

## Section 1: Introduction and Background

### 1.1. General

This report, prepared in fulfillment of the case studies, analyses the EMDU program with emphasis on its influence on public policy.

The major objectives of this report are:

- identifying public policy influence in the Centre's experience;
- defining the ways and level of the Centre's supported research influence on public policy;
- finding factors and conditions that facilitate or inhibit the public policy potential of the Center.

In addition to analysis of work undertaken by the Center, the report covers the description of the environment (legal, political, economic, social) of program implementation.

This section provides general background of the EMDU program, a general overview of projects, and a strategy of analysis.

### 1.2. Background

In 1994, the International Development Research Center (IDRC) and the Department of External Affairs initiated the Environmental Management Development in Ukraine (EMDU) Program. The program began on April 1994 and was focused on the Dnipro River Basin. In 1997, the program came to a successful close. On July 9, 1996, the Board of Governors approved the development of a program in East and Central Europe, giving OCEEI the support to plan and work toward a longer-term program. OCEEI proposed a second phase for EMDU, both to follow up in those areas where further work was needed and to move into new areas. Thus, OCEEI proposed the Environmental Management Development in Ukraine, Phase 2 (EMDU-2). The second phase of the program came to a successful close on December 31, 2000. (see Environmental Management Development in Ukraine - Phase 1 (EMDU-1); Environmental Management Development in Ukraine - Phase 2 (EMDU-2)).

The major components and major projects of the programs were (sources: Environmental Management Development in Ukraine - Phase 1 (EMDU-1); Environmental Management Development in Ukraine - Phase 2 (EMDU-2); see Dnipro Ecological Rehabilitation. The Experience of Ukrainian-Canadian collaboration 2001: pp.74-209 for details):

#### 1. Water Pollution Control

*Baseline Water Quality Study:* three Ukrainian institutes, the Ukrainian Scientific Center for Protection of Water (USCPW), the Institute of Hydrobiology and Hydromet undertook a Baseline Water Quality Study of the Dnipro River in the spring of 1994. IDRC helped the institutes to organize the baseline study, and provided short-term training by a Canadian expert. Some critical pieces of laboratory equipment were also financed by IDRC.

#### 2. Water Toxicology

*WaterTox* project (phases 1 and 2) was aimed at demonstrating the validity of a battery of six inexpensive and simple, yet effective, bioassays to test for the presence of toxins like pesticides, heavy metals, and organic chemicals in water. Because of its international nature, the project provided the fringe benefit of plugging Ukraine into international

networks, in some cases re-establishing with the developing world the important ties that were severed following the collapse of the Soviet Union.

*Joint use of Biotests* project allowed the recipients to compare the effectiveness of the WaterTox battery with that of another suite of tests already being employed by the Ukrainian Scientific Research Institute of Ecological Problems (USRIEP); to test current water conditions using both methods; to exchange testing materials, cultures, methods and knowledge between the Institute of Hydrobiology and USRIEP; and to organize joint workshops for training, information exchange, and dissemination.

### 3. Information systems development.

*Environmental Management Information System (EMIS)* was designed for the Dnipro river basin and was reviewed with the large number of institutions who will use this system. A pilot information system is used in Zaporizhzhia. Regional environmental management capacity in the Zaporizhzhia oblast has been strengthened by intensive training, and integration of existing databases.

*Interdepartmental Database* project was implemented by the Hydrochemistry Department of the Ukrainian Research Hydrochemistry Institute (UHMI) and resulted in the creation of the computer-analytical database which deals with chemical composition and quality of the Dnipro surface water.

*Dnipro Environmental Management Information System (DEMIS)* was aimed at analysing and putting to use the results obtained in the course of information systems development under the Canadian Program “Environmental Management Development in Ukraine (the Dnipro Basin)” including REMIS, BEMIS, EMIS and a few other systems.

*Regional Environmental Management Information System (REMIS)* project funded the creation of a turnkey version of Regional Environmental Management information system in the lower area of the Dnipro River assigned for informational support. It was aimed at testing and creation of conditions for the further systems operation and unification to the information system for Dnipro Basin.

*National Environmental Management Information Centre Development* project was aimed at determining hardware and software requirements for a national Centre of Environmental Management at MEMPS and at installing a pilot network for environmental data collection and processing.

*Dnipro GIS Pilot Project* was aimed at developing a pilot Geographic Information System (GIS) for the management of the Dnipro watershed environmental data using Zaporizhzhia region as a case study.

*MEPNS Internet Connection and Web-Page Creation* enabled to purchase computer equipment, receive internet and web-page design training, connect to the internet, and then design and post a multi-lingual web page on Dnipro Basin activities.

*National Atlas of Ukraine* project allowed development of thematic maps; creation of an electronic data base; completion of map visualization; development of the structure of annexes; formation of annex electronic data base; design of a cartographic data base for complex outline maps; and a creation of an Electronic Atlas version.

### 4. Pilot projects

*Demonstration Shoreline Project* allowed accessing engineering and management approaches applicable to the shoreline areas of Dnipro River reservoir, contributing to an

improvement of the water quality in these reservoirs, and to put in place a 2-3 kilometer length of managed shoreline which demonstrates protection measures applicable elsewhere along Dnipro reservoir shorelines.

*Solid Waste & Landfill Remediation* project allowed determining the extent and chemical composition of leachate produced by the landfill and its impact on the Dnipro River. Based on the hydro-geological and surface water flows investigations, a leachate collection system was designed and installed to intercept contaminated ground and surface waters from the disposal site and pump them to a small treatment plant.

*Drinking Water Technology* project allowed construction and installation of treaters “VEGA”, “VEGA-1U 300”, VEGA-2U 1000”, and “VEGA-3UM 300”. These treaters are currently in operation.

*Rising Groundwater Protection* project allowed working out economically and ecologically efficient ways of rising groundwater protection. Pilot model WELLSU was installed in Rzhyshev.

*Organomineral Fertilizer Production* project introduced technologies for organomineral fertilizers production from sewage sludge and other kinds of waste (phosphogypsum, lignin) accumulated in large quantities within the Dnipro river basin.

*Evaluation of Groundwater Pollution* project allowed carrying out study of settling ponds of Poltava ore mining and processing plant, real volumes of discharges entering surface, and working out recommendations on discharge control and spreading out the outcomes.

*Drinking Water Treatment* project allowed development of potable water treatment technology & pilot production of compact water purifiers for urban and rural utilities.

## 5. Environmental Audits and Environmental Entrepreneurship

*Light Industry Audits* project (Textile, Tannery) allowed conducting environmental audit at two light industry enterprises and introducing low-cost measures to make production more environmentally friendly (“Chinbar” tannery based in Kyiv and Cherkassy silk-weaving mill).

*Environmental Audits* project allowed carrying out environment audits at the following 5 enterprises in food industry: Yagotin sugar factory; Yagotin milk processing plant; Popiv distillery; Kremenchuk milk processing plant; and Vatutino meat processing plant. Recommendations were provided. The relevant applicable legislation & standards have been elaborated. Manuals were prepared and published, groups of specialists trained.

*Environmental Audits in Zaporizhia* project allowed carrying out environment audits at Zaporizhia Aluminium Production Industrial Complex; Zaporizhcoke; Zaporizhia Research and Development Engineering Plant; Zaporizhia Vodokanal; and Brewery Slavutych. *Non-capital improvements* allowed the International Dnipro Fund, Zaporizhia to choose, install, and analyze the effectiveness of non-capital environmental equipment in five enterprises, as a follow-up to environmental audits previously conducted there.

*Training of Environmental Entrepreneurs* project was aimed at training a leadership group of entrepreneurs, who demonstrated their interest and ability to create and manage environmental enterprises, and at reinforcing the International League for Environmental entrepreneurship support in Ukraine by developing its own training and methodological base.



*Environmental Entrepreneurship* project allowed identifying the problems, ranges and priorities of the environmental entrepreneurship development within the Dniپر river basin, as well as ways of attacking those problems, based on rendering consulting services and setting up informational and educational prerequisites for implementation of the Package Project.

#### 6. Public Outreach

*Raising Public Awareness of Environmental Problems* project allowed dissemination of information about present environmental situation in basin of the main waterway of Ukraine. *Environmental Television Program and Videos* allowed developing various forms of TV materials and promoting increase of nature preserving consciousness of the community, activated its practical participation in realization of the National Program of Environmental Sanitation of Dniپر River Basin and Improvement of Drinking Water Quality.

*Dniپر – the Artery of Life Book* project allowed publishing an illustrated color book in Ukrainian and English on the current problems, present state, and prospective development of the Dniپر Basin River.

### **1.3. Strategy of Analysis**

In our study, we base upon the interviews with key participants of the program (project leaders and project participants); with those said to have been influenced as well as relevant Centre staff. We used an interview guide developed by the Evaluation Unit of the IDRC.

Our report covers the issues of environment of the program, gender issues, and the ways of program policy influence. We also focus on the managerial peculiarities of the program (i.e. the experience of the Ukrainian Management Committee (UMC) and IDRC approach as well as administration of the program through the International Dniپر Fund (IDF)).

## Section 2: Program Environment

Implementing a program in an environment that was different from other developing countries of the world was extremely challenging. “Countries under Soviet rule were closed for seven decades and missed out on many of the paradigm shifts that characterized western evolution in the twentieth century.” (Guilmette, Iskra 2000) In many cases, Western notional standards did not correspond to Ukrainian reality. And, in the very beginning of the first phase of the program, it was difficult to state what could be achieved in a totally new environment:

I will be honest with you. I do not think, initially, anybody had any idea of whatsoever, about what could be accomplished here... We have come to another planet, let us make a contact ... I do not think anybody had any idea of what could be written down as reasonable objectives to achieve. I think it was mainly to make a contact. (Myron Lahola)

We tend to look at governments in Eastern Europe and in the former Soviet Union through our notional standards. If Ukraine says they have a Ministry of Justice, we say we know what that is. Let us work with them. We actually have no idea of what the Ministry of Justice is in this country. (Lubomyr Markevych)

Western understanding of the *policy process*<sup>ii</sup> as the one that implies involving the participation of a great number of concerned actors<sup>iii</sup> is not always applicable to Ukrainian reality. For many decades, Ukraine was organized as a hierarchical system. “There was little experience of democracy and political rights, which ... were limited to ritual participation in elections...” (Maravall 1997: 207) The leaders made the policy, and everybody else implemented it:

In our country, a lot of things depend on the personality. If the head of the administration sees the perspective and use in what he does, he will do a much better job. If the head thinks only about getting into the Parliament, he will do a much worse job. (Olexander Mazurkevych)

In any undertaking, the major thing is a “good head” [meaning a leader]. If the head does not work, than the body will not operate well. (Anatoly Yatsyk)

Establishing civil society in a country with no experience of popular participation turned to be problematic. According to Taras Kuzio, in contemporary Ukraine, civil and political society are contested by different regional, clan, and oligarchic groups. As indicated in the interview with Yury Pavlun, these groups were formed around influential economic centres: industrial centre Donbass; Dnipropetrovsk-Zaporizhia; Kyiv financial-administrative centre; and western Ukraine<sup>iv</sup>. These groups compete for influence on state bodies of executive power, on legislative bodies, and on President. And they have little concern for the public good or for what people think:

One cannot state that the government cares one way or another about what these people are saying... The oligarchs can go either way, whatever is in their interest. The government (Presidential elite) can go either way. And, it does not matter what people want. (Lubomyr Markevych)

In our country, everyone lives and works separately: President separately, government separately, and peoples separately. Everyone is solving his own problems. Everyone survives in his own way: from a watchman to the President. (Kostantyn Chobotko)

The process of political structuring (creation, restructuring, and uniting different parties) went the other way around: instead of being created to protect the interests of their electorate, they are created to compete for the spoils of office. And, only after their creation, they are looking for the electorate:

Now, parties are created and then, they look for electorate. It should be done in the opposite way. The social basis should be formed. (Yury Pavlun)

The people themselves are not ready to acknowledge that their opinion should matter. During Soviet times, people learnt that “the initiative is punishable”, and this lesson turned to be difficult to forget especially under conditions of uncertain political situation. The people remain passive and scared:

People are inert, passive, and scared. They always lived in fear. It is difficult to change our generation. The next generation might be more efficient. Maybe, we just do not care about ourselves. Maybe, it is because of the poverty. (Kostantyn Chobotko)

The people have shown over 10 years that they have not reached a point where they would either vote, or support a candidate who is pro-reform, or go out into the street. (Lubomyr Markevych)

Being used to living in fear, the people were sometimes reluctant to cooperate with donors' organizations:

I suppose, a constraint and barrier initially was, and to some extent exists even today, this paranoia or fear of the West, fear of other ideas, fear of being criticized... We had access limited to certain facilities: water plants, wastewater plants, landfill sites, pump stations, and reservoirs. Sometimes, we were denied access. (Myron Lahola)

The people cannot define what is best for Ukraine, so the decision-makers do. In such a way, Ukraine appears to have an absence of direction. It cannot be said that it is pursuing a market economy, democracy, and joining European Union the way the other post-socialist countries (not including Belarus and Russia) are:

If you do not have a clear vote for one person who will lead you either to the Belarus-Russia Union, or into the European Union, then, you have no direction. (Lybomyr Markevych)

“Most tenets of a market economy were never as profoundly challenged as they were under Soviet rule.” (Final report (EMDU2:32) The process of changes from precarious social protection to economic freedom was extremely painful. People were used to being protected by the state and being economically free under severe economic crisis was not something they really wanted. They had good reasons to be skeptical about the process of transformation that brought a cut in pay, price increases for food and other state subsidized essentials, and the possibility of unemployment. People lost security, the major advantage of socialism. And, they did not know how to live in a totally different environment:

People's evolution was important as well. First, it was an emotional enthusiasm. Then, when the old economic system collapsed, people lost jobs in the result of enterprises' closure. This was a period of psychological crisis... People who lived for 50, 60, 70 years in one state should realize that now, they are living in a totally different state. (Vasyl Shevchuk)

Additionally, the crisis the people lived through was extremely prolonged, as Ukraine was slow to implement economic reforms. “Limited progress was achieved in privatization, the liberalization of prices, and the reduction of trade barriers and subsidies. Widespread resistance within the parliament and the government itself slowed, or even blocked, reform efforts.” (Nations in Transit 2001) Resistance to the implementation of economic reforms showed itself in a halfway economic policy. On the one hand, policy makers were trying to keep some elements of state protection, but on the other hand, they were declaring the transformation to a market economy. Thus, Ukraine approached economic transition differently than the non-Soviet countries of the Warsaw Pact. Major differences in economic transition policies were connected with a less sizable private sector, smaller increases in unemployment, larger declines of real wages, and a longer period of declining output in Ukraine as compared to non-Soviet countries (Milanovic 1998).

In addition to the economic problems, Ukraine has to establish itself as a state since it is practically a 'new' country in the sense that it had no experience in self-government and was not independent (Milanovic: 3).

Seven years of the program are 70 percent of the time of Ukrainian independence. And, of course, everything that happened, a huge transformation of socio-political, economic, and ecological system, influenced the program. ... Within these seven years of independence, we were solving a lot of problems of the young state. No one other country in the world had such a path. We had to develop our political system, our system of international relations, and we transformed our economic system. (Vasyl Shevchuk)

Though there is no doubt that the environment is an area that should be paid the most attention to in Ukraine<sup>v</sup>, the economic crisis and problems of a young state resulted in the environment and scientific research not receiving sufficient funding. Or, in the words of the interviewees, it was not considered a priority. This situation was common for the other post-soviet countries:

In Belarus, Russia, and Ukraine, there is no environmental policy being developed because it is not a priority... On the level of policy, Ministries do not make any changes, because they [environment, culture, and education] are a low priority. (Lubomyr Markevych)

Unfortunately, at present in Ukraine, scientific research is not considered as a priority. This is first of all due to lack of financing. Scientific institutes lost a large number of specialists. They left to the U.S., Canada, European countries, and Israel. In particular, the Research institute of Urban Development, I was working at, worked for the whole Soviet Union. 250 specialists, 10 doctors of sciences, 40 candidates<sup>vi</sup> of sciences worked there. Now, only 26 people stayed. A lot of people went to the Universities. This is an attitude towards science at the national level. (Olexander Mazurkevych)

Administrative reform in Ukraine brought significant structural changes to the bodies responsible for implementing environmental policy. According to the Presidential Decree, *On Changes in the Structure of Executive Power in Ukraine*, that was issued in December 1999 (see <http://rada.gov.ua/laws>), the Ministry of Ecology and Natural Resources of Ukraine was formed on the basis of the Ministry of Environment Protection and Nuclear Safety of Ukraine, State Committee on Geology and Minerals Use, State Committee on Hydrometeorology, State Administration of Nuclear Regulation of Ukraine, State Department of Geodesy, Cartography and Cadastre, and the State Commission on Testing and Registration of Means of Protection and Regulators of Plants and Fertilizers. As a result of this reorganization, a lot of key participants of the EMDU program had to leave the Ministry:

In Ukraine, personnel policy (especially concerning the personnel of the Ministries and other governmental institutions) has not been worked out. Changes at the Ministries from the top to the bottom lead to the fact that new leaders try to attract people not on the basis of their knowledge and skills. As a result of one of such changes, some of those people, who were key participants of the EMDU program, had to leave the Ministry. This happened as a consequence of reorganization of the Ministry when Ministry and other governmental structures were reorganized into the one Ministry of Ecology and Natural Resources. This happened in the end of 1999, and it was one of the stages of the administrative reform. 20 ministries remained in the Cabinet of Ministers. It was presumed that the integration of the executive bodies would improve the effectiveness of the latter. (Iryna Trofimova)

Structural changes in the Ministry were associated with constant changes in its leadership. Political situation in the country was stated as the reason for the latter:

Unfortunately, the position of the Minister of Ecology became a "small change": it is given to particular parties [i.e. political] at a particular time. (Anatoly Shmurak)

I think that frequent changes of the minister are connected with the fact that this sphere is always visible (in sight). We want immediate results and it seems that Ministers do something wrong. And, system has a feature of inertness. This is nature. Nothing can be done immediately. It is impossible to say that the former ministers did not manage to do their job well. The changes were connected with the political situation. (Natalia Movchan)

Constant changes at the Ministry of Ecology and Natural Resources of Ukraine were seen as one of the constraints in the program's implementation by the interviewees. These changes brought a discontinuity:

Every time there were changes in the Ministry, the situation became complex for the program. New people appeared, new views appeared. Any changes are bad in this situation. Within seven years, 3 or 4 Ministers changed. (Olexander Vasenko)

Ministers changed so frequently that it was difficult to work with them. The level of Minister for everyday decision-making was not appropriate. This was my suggestion in the beginning. And, it turned to be true. Therefore, the President introduced the positions of State Secretaries. Ministers change, and they are political figures, while state secretary is like a workhorse. (Viktor Romanenko)

Another problem the program had to deal with was connected to the absence of a banking system:

When we started here, there was absolutely no banking system. Transactions were made in cash or in barter... Now, we have at least a rudimentary banking system where we could have a bank account and transact business in more or less normal fashion. ... Today, we still have problems especially, when it comes to transactions amongst former soviet countries. (Myron Lahola)

The program was implemented in the country under condition of a deep economic crisis that was reluctant to pursue economic and political reforms. This resulted in little attention being paid to the areas of ecology and scientific research. Constant changes at the Ministry made the situation even more difficult. The absence of a banking system made it impossible to conduct business in a normal way. And, the program itself was a complex one:

...because the project was operated in untested territory and neither side knew much about the other, a "shotgun" approach was used, covering the entire gamut of activities from hard science to NGO-strengthening to economic management and information system. (Final Report and details of the period 01 January-30 September 1997)

According to Rose, complexity is a major factor constraining the transfer of policies (see Neilson 2001: 37). And, some of the interviewees shared this opinion:

When I got acquainted with the initial scheme and a list of the tasks of the program, I realized how difficult it was to implement. I thought it would never work. In reality, it worked. (Olexander Vasenko)

Despite all the constraints and barriers at the national level, the program was successful. All the interviewed participants of the program stated that the objectives of the projects (or, program as a whole) were either achieved, or overachieved. This brings us to consider the factors that were crucial to the program's success. Among all factors, program management was the most decisive.

### Section 3: Management of the EMDU Program

#### 3.1. IDRC

Jean Guilmette (1998) stated that the IDRC was able to achieve its goals by building relationships based on trust, carrying out business in an open and transparent fashion, relying on its local partners as equals, employing local talent to the greatest possible degree, and choosing to build up local institutions to function without its help. Interviewees characterized the IDRC approach in a similar fashion:

We always took the approach that we are not coming here with magic answers to teach you, we are coming here to show you some of the things that we did right, some of the things that we did wrong. You make your own choice on what works for you. That is kind of approach we took... (Myron Lahola)

When Jean came, the relations of mutual trust were established. I could not say the requirements were not strict. They were very strict; especially those put by Ken... (Olexander Mazurkevych)

IDRC carried out the overall management of the program and provided consultations (consultant had advisory and controlling functions). The project was more oriented towards Ukrainian specialists. We were trusted, though controlled. (Olexander Kolodiazhny)

The readiness for compromise was one of the most important elements of the program. (Anatoly Stashuk)

And, as our interviews reveal, the IDRC's approach, based on mutual trust, was an important factor in the program's success. The importance of mutual trust and openness in program implementation was acknowledged by virtually all interviewees:

The ideology of Jean Guilmette was "You know better what to do, and we will help you in achieving what you need." We built our program in a correspondent way. We addressed the problem, we demonstrated this problem with the help of the pilot projects, and then, we trained people through the educational system and developed the program of re-training professionals in this direction. If we did not have this ideology, we would never achieve the results we achieved. (Vasyl Shevchuk)

The openness and mutual trust were the most important factors in the success of the program. (Anatoly Yatsyk)

Mutual trust played an important role in Ukrainian-Canadian collaboration. Canadians trusted Ukrainians, and this led to positive results. ... There was no dictatorship on the part of Canadians. Committee was choosing the directions of activities. The projects were selected on a competitive basis by the UMC. Canadian side gave the right to decide what was the best. We were not forced in our activities. (Vasyl Navrotsky)

People are not likely to accept others teaching them. It is a natural human response. And, IDRC emphasized its importance to the consultants.

[Ukrainians are reluctant to accept others teaching them...] May be, to some extent, they are more sensitive that way (Ukrainians, Russians), because they had a powerful role in the world when it was the Soviet Union, and now, they feel that they have to some extent lost this kind of prestige... I do not think, one can say this sensitivity is unique to Ukrainians. I think, anybody is like that. It is a natural human response to someone who comes in and appears to be have all of the answers. I personally tried to emphasize to consultants and anybody we brought in here to be conscious of that. (Myron Lahola)

IDRC provided consultants' assistance in projects' development that was stated as extremely valuable within many interviews. In particular, Darko Poletto's help was mentioned as important in the interviews on informational technologies projects (see O.Kolodiazhny, O.Trofimchuk, V.Osadchy interviews), John Pain consultations – in an interview on the project connected with raising groundwater protection (A.Yatsyk interview), John Fodji on projects on biotesting (V.Archipchuk interview), John Gartner on landfill studies and the Training Environmental

Entrepreneurs Project (Igor Broide). Ken Babcock help was stated as important in projects' development and implementation (see, in particular, A.Yatsyk, O.Mazurkevych interviews). While acknowledging the professionalism of the IDRC's consultants, interviewees also appreciated their human qualities:

Bernie Dudka, Christian Blasé, Rodney McGinnis, John Fodgi who taught us biotests' methodology, surprised me with the combination of human qualities and position in a scientific hierarchy. In our country, sometimes, scientists are doing administrative, but not a scientific career. This was not the case with the Canadian scientists. (Viktor Archipchuk)

The work and human qualities of the IDRC (Kyiv office) personnel were stressed as well:

Myron Lahola, Igor Iskra, Lesya, and Ira Rudenko are very good people, and such people should work in the international organizations. (Gennady Scherbina)

Many interviewees made a comparison between the EMDU program and other donors' technical assistance programs. A preference has been given to the former:

[Other donors' organization] continues to think that we do not understand anything and tries to teach us, works out the strategic plan of actions by itself, and 90% of work is implemented by foreign experts... I do not think that the result of this program will be as valuable as the result of our program though much more funds are spent within it. (Vasyl Shevchuk)

It became the most progressive program out of all I dealt with. This was my first program and it turned to be the most progressive one. (Anatoly Stashuk)

Besides acknowledging the importance of the IDRC approach, interviewees also stated that MENR is trying to use the mechanisms initiated within the EMDU in other donor's technical assistance programs. And, willingness of the Ministry officials to implement other donors' programs in the way, EMDU was implemented, may serve as an additional example of the importance of the IDRC approach:

There were things and documents that worked after the program implementation. The experience of the UMC was implemented within the GEF program... TACIS has its own form of the program implementation, but people in the Ministry want to use the UMC experience... (Anatoly Stashuk)

Perhaps the most important factor of success of the program was connected with the fact that local partners were relied on, they were given an opportunity to decide for themselves. And, taking this approach led to the most important consequence of the program on a global scale, trust and friendship between the countries:

What I know for sure, is that IDRC left a legacy here that Canadians are people that are easy to work with, are not only friendly, but also diplomatic and people who do things using a process of consensus building. I have heard this not only from Ukrainians, but from other donors' organizations. This is a real plus not only for future Canadian business here, but also in terms of Canadian influence on the politics strategically in Central and Eastern Europe. On a global scale, one of the most important things you can develop is trust and friendship between the countries. (Myron Lahola)

### **3.2. Ukrainian Management Committee**

Almost all the projects (as well as the EMDU program as a whole) presumed policy influence from the very beginning. Therefore, including the active participation and involvement of decision makers was important since it "results in a higher potential of influencing the relevant policies" (Neilson 2001: 27).

The Ukrainian Management Committee (UMC) involved senior government and research people who vet proposals and outputs ( Final Report: Environmental Management Development in

Ukraine: Phase 2, 15 April 2001). It was established by the Minister of Environment protection and served as a bridge for interaction between the IDRC and the government of Ukraine. The UMC was responsible for successful program implementation and was accountable to the IDRC for the quality of the projects supported by government institutions (Environmental Management Development in Ukraine 1994: 67). According to the interviewees, the UMC management was efficient and made an important contribution in overall program success:

UMC had a well-developed mechanism of its work. ... I do not know a case when anyone had any complaints when they were not selected. (Anatoly Yatsyk)

In general, program was interesting, and it was extremely efficient. Each project was useful. This was due to the efficient management on all steps: from idea to signing a contract and submitting a report. This role was successfully implemented by the UMC. (Vasyl Navrotsky)

The structure of the UMC presumed the participation of high level officials from different specialized government institutions (the Ministry of Ecology and Natural Resources of Ukraine, the State Committee on Hydrometeorology, the State Committee on Water Economy, and the State Committee on Construction, Architecture, & Housing Policy):

The same people worked at the UMC and at a policy level. (Iryna Trofimova)

The involvement of government increased the potential for policy influence. The involvement of senior research people facilitated the links between researchers and decision makers. It was important that the people who managed the program, also had the power to use its results in the decision making process. It was equally important that decision makers had an incentive to do so:

For decision makers, this is not only the way to do something good for their country, but also a way of self-establishment, self-expression. Therefore, besides official interest, they have a personal interest in scientific research. (Eduard Reznik)

Since the UMC members occupied high level positions in different government and research institutions, they were not in boss-subordinate relations and were not afraid to openly express their views. In such a way, the UMC served as an efficient mechanism of sharing policy ideas:

The UMC consisted of high level officials (if to take governmental structures, not less than Deputy Ministers) and Heads of the Institutes. This was important. The work of the Committee was not given to the people who did not have power, who did not have influence. This provided a positive result. There was a psychological aspect as well. We could discuss [projects] openly and substantiate our view of the problem. While considering the project, we discussed it, and expressed our views with no fear. (Grygory Semchuk)

Among other reasons of the UMC effectiveness, discipline and systematic functioning were mentioned:

Everyone knew that each last Friday of the month, the meeting at Shevchuk office should be attended. There was a discipline, because if a person did not attend a meeting, he would be removed. (Anatoly Yatsyk)

Everything can be done when there is a system at work. UMC worked systematically, therefore, there is a positive result. There was a discipline (Grygory Semchuk)

The form of policy network, represented by the UMC, is close to the *policy community*, since it emerged around the issue of Dnipro rehabilitation, its composition presumed involvement of the specialists in the area of water resources' management and environmental protection, it revolved around the specialized government institutions, and consisted of *policy entrepreneurs* (see Neilson 2001: 24).



Dr Shevchuk who had been a chairperson of the program from its inception in 1994 until its last meeting in February 2001, was a bright policy entrepreneur . Throughout the program implementation, Dr. Shevchuk occupied authoritative decision making positions: the Deputy Minister of Environment protection; the First Deputy Minister of Environment Protection, First Deputy Minister of Economy, Minister of Environment protection, and the Head of the executive body of the National Security Council. The Dnipro rehabilitation became the sphere of his interests before the program initiation:

In 1992, two years before the Program initiation, I finished my doctoral thesis... I started to look for challenging problems and issues that could become a part of my life. And, Dnipro was one of these issues... Then, we initiated research, started to include this problem in the state policy. Since everything in this world is interrelated, our roads crossed at some point with Canadian partners. And, in 1994, we started our cooperation within the program. (Vasyl Shevchuk)

According to Wind & Bernard (quoted in Neilson 2001: 33), “it appears to be necessary that someone actually care about the issue...” The way, Dr Shevchuk expressed his attitude towards the program and the area of Dnipro rehabilitation, may serve as a proof of his devotion:

- My career, my soul, and my scientific interest were integrated within this program.
- For seven years, we lived within the program.
- I became the part of the program, or the program became the part of my life...
- The idea of Dnipro rehabilitation (not only economic, but also spiritual rehabilitation) was very important for our society. It is a national concern. Everything comes together in this place. Our natural resources, economy, environmental protection, health and life of the people, culture, spiritual life, history, tradition, and our future development. This is really a strong national idea for Ukraine.

Due to the negotiating skills of Dr Shevchuk and the other UMC members, it became possible to implement the projects questioned by some public servants. And, the *Baseline Water Quality Study* was one of those projects:

In September 1994, the first Ukrainian-Canadian expedition was planned. At that time, some officials of the Ministry of Environment protection wanted to impede the expedition. They tried to postpone it, questioned its importance. And, they tried to influence the Minister for him to take a negative decision. However, when we provided the information, he took a positive decision. We did carry out the expedition and we reached our goals. (Vasyl Shevchuk)

The role of Dr Shevchuk in program success was acknowledged by the interviewees. His personal qualities, the way he organized the UMC work, and his high level position increased the program potential:

I would like to emphasize the work of the UMC, the team that was led by Shevchuk. This was a concrete, precise work. This confirms once again that a lot depends on personality. (Grygory Semchuk)

During the project, there were no political constraints, because Shevchuk was the Minister. (Olexander Trofimchuk)

I regret that Vasyl Shevchuk is not the UMC head anymore [meaning the UMC of the GEF program]. Thanks to his personal qualities, this program was successful. The committee as a whole consisted of good people and high-level professionals. (Gennady Scherbina)

Sometimes, a collaboration between Canadian and Ukrainian sides was referred to as collaboration between Jean Guilmette and Vasyl Shevchuk:

The program was conducted on a high level. This was due to Jean Guilmette on Canadian part and Shevchuk on Ukrainian part. They had good creative relations. (Anatoly Yatsyk)

As interviewees' opinions suggest, the UMC was an efficient way of managing the program due to (1) incorporating policy makers/ high rank government officials; (2) personal qualities of chairperson Vasyl Shevchuk, his devotion to the program, and high level position; and (3) discipline and systematic work. The UMC also served as an efficient mechanism of sharing policy ideas and strengthening the information exchange between policy makers and researchers. The UMC and its chairperson were the "moving force" (Anatoly Stashuk) of the program implementation.

### **3.3. *International Dnipro Fund (IDF)***

The most significant constraint was the presidential decree issued officially in December 1996 but coming into effect in September 1997, subjecting foreign donor money to heavy taxation (see, for example, Final Report with details on period from January 1 – September 30, 1997; Report No.OCEEI.54, 21 October 1997).

When we started the program we faced difficulties (legislative, financial, and other) that seemed to be impossible to resolve. In particular, according to the legislation, it was necessary to pay a substantial tax for the IDRC grants. (Viktor Romanenko)

To rectify the problem, the IDRC through close collaboration with local partners, worked out a scheme that presumed a movement of funds through the Dnipro Renaissance Fund (DRF) on a tax-free basis. And, DRF managed to resolve the financial aspect of the program in accordance with Ukrainian legislation:

There were many problems with financial aspect of the program. The financial mechanisms, the bank systems were underdeveloped. We had problems with financing the projects. We solved these problems thanks to the DRF. The DRF developed its own methodology for financial administration. Their methodology was very complex, but it allowed them to do the operations consistent with the Ukrainian legislation. And both Ukrainian and Canadian inspections did not find any violations in the way the program was financed. (Vasyl Shevchuk)

DRF also played an important role in the program implementation. It was important that they helped in financial issues. I am sure that inspections did not find any violations in financial aspect thanks to the DRF. (Gennady Scherbina)

While summarizing the stated factors of program success, one may refer to the words of the program participant:

We had a good team on both sides (Ukrainian and Canadian). And, we wanted to change something. (Volodymyr Razguliaev)

## Section 4: Public Policy Influence

### 4.1. Expanding policy capacities

#### 4.1.1. Improving the knowledge/data of certain actors

The *Baseline Water Quality Study* was initiated in the beginning of the program to create a reliable data base on water quality of the Dnipro. The problem was connected with the fact that existing data was collected using outdated equipment and different data sources provided contradictory information. It was presumed that the reliable data base may serve as a prerequisite for reliable planning and priority setting (see Environmental Management Development in Ukraine 1994: 45-48). In terms of Weiss' three models of research, this particular study can be considered as the *research as data* (see Neilson: 11).

According to Weiss, *research as data* is likely to be influential in situations of consensus on values and goals; and when decision makers are analytically sophisticated (Neilson 2001: 11). As our brief program environment description suggests, in Ukraine, such type of research should not be influential since Ukraine appears in the situation of no direction: there are no common goals. However, one cannot state that this kind of research within the EMDU program did not have any impact on public policy. In particular, the results of the Ukrainian-Canadian expedition were used in defining the placements for health camps on the Dnipro basin:

We conducted the expedition in the Dniper basin, where we defined its condition with respect to different kinds of pollutants. And, we made the recommendations on where to place some health camps. As a result of the project, some of the placements planned before were changed. (Anatoly Gritsenko)

It also attracted the attention of the local governments' officials:

In the course of expeditions, we received interesting results that we were not forced to distribute among raions where the research had been conducted. However, people in raions were interested in our results. And, we sent them all the results they wanted to receive. We attracted their attention to the major problems, provided information on water condition in particular places... They appreciated our information and used it. I am very glad that though we did not have expeditions for a long time, they still call and ask for a help. (Olexander Vasenko)

The data obtained within the expedition was stated as a good point of reference in the future:

Baseline survey was a complex one. We looked at radiology, chemistry, and biology. We had an opportunity to select the best specialists from different institutions. Therefore, it will be a good point of reference in the future. (Olexander Vasenko)

This was the first comprehensive expedition in Ukraine, and it formed the basis of the GEF program. (Viktor Romanenko)

Thus, the Baseline Water Quality Study provided a reliable information on water quality in the Dnipro. This project was stated as successful and the one that had a policy impact. In addition to a reliable information, the efficient ways of its processing and dissemination were essential. And, EMDU addressed these issues within the *Information Technologies Projects*.

#### 4.1.2. Facilitating data exchange and dissemination

The IDRC willingness to share the information seemed amazing to Ukrainians:

I think this is one of the features that Ukrainians found interesting, that IDRC was so open and willing to share information. Anytime someone came to the office; we gave them anything they wanted. This was quite interesting and amazing to some of them that we never thought any information whatsoever was secret or private. (Myron Lahola)

As opposed to the openness of the IDRC, the Ukrainian organizations were characterized by the high level of secrecy. Post-soviet countries inherited the *soviet caution*, as Anatoly Shmurak defined it. And, a willingness to keep information in secret was common for Belarus, Russia, and Ukraine. According to Nikolai Mikeev:

Roughly speaking, all the information is concentrated in state organizations. We are not very far from the centralized management yet. Anyway, the information on Russian rivers is concentrated in the Centre of Register and Cadastre. And, if someone wants to get this information, any private expert, he will have to steal it...

There was a soviet caution, a willingness to keep the information in secret. (Anatoly Shmurak)

We were afraid to disseminate the information. We kept it for ourselves. (Volodymyr Osadchy)

The Soviet caution hindered the implementation of the program. On the one hand, the fact that foreign experts could use an information was risky for those who provided such an information. In particular, the law of 1937 presumed that the information on cities' vodokanals should be kept in secret. And, violation of this law led to the problems for program participants:

There was a law of 1937 according to which water supply of the cities should be kept in secret<sup>vii</sup>. A criminal case against me was opened since I violated this law. (Volodymyr Razguliaev)

On the other hand, Ukrainian research institutions were not willing to share the information. And, the program participants had difficulties getting it. Sometimes, they had to pay for it:

We had problems with data. Though data was supposed to be provided for free, detailed information was paid, or even not accessible at all. At the UMC meeting, we asked the heads of the organizations we worked with to name the people who would be responsible for providing data within their institutions. ... And, still we paid for some data. (Olexander Kolodiazhny)

As we noted earlier, the EMDU program addressed the issue of facilitating data exchange and dissemination within the *information systems development projects*. Perhaps, the most successful project aimed at data dissemination was the *National Atlas Project*.

### *National Atlas Project*

As interview with the project manager Leonid Rudenko reveals, the project was aimed at showing the possibilities and readiness of Ukrainian specialists to create a national atlas. The project was not directly connected with the Dnipro issues, and its approval may serve as an example of IDRC readiness to compromise, that led to positive consequences: the project went far beyond its initial goals.

The CD-ROM, created within this project, provided an opportunity to see Ukraine as a whole, its industry, history, electorate, demographic trends, economy, ecological situation as well as Dnipro basin condition. And, though the policy influence was not discussed in the beginning of this project<sup>viii</sup>, the project was one of those that facilitated changes at a policy level and in legislation (see section 4.3).

National Atlas was widely disseminated after the project completion. According to the project manager Leonid Rudenko, some of the maps (about 17-18) included to the National Atlas of Ukraine were provided to the Ministry of Ecology and Natural Resources of Ukraine (MENR). These maps were included in textbooks and books. Atlas is used at the Ministry of Economy and European Integration, at the Committees of Verhovna Rada of Ukraine, and at the Ministry of Foreign Affairs. Minister of Education, Kremin, showed that Ministry was interested in this atlas

for its use in schools. Viktor Chabaniuk who was responsible for the technical side of the project stated that the additional copies of the CD were issued after project implementation, and his organization (Intellectual systems GEO) continues to sell it. One can find the information on National atlas on Intellectual systems GEO web-site [www.isgeo.kiev.ua](http://www.isgeo.kiev.ua) as well. And, finally, there are pirate copies of the product (CD-ROM Atlas of Ukraine, 2000) that are widely disseminated.

The form of presenting the atlas was important for its success. As Viktor Chabaniuk stated, issuing brochures is not as efficient dissemination strategy as creating a disk. While he recognizes that the majority of population does not have an access to computers now, he states that if to look at the issue of computerization from a historical perspective, we will understand that soon, all people will have an access to computers:

This argument might be serious, but if to look historically, we will see that this argument will not be as serious in the nearest future. (Viktor Chabaniuk)

Research quality is an important element for a research to have a policy impact (see Nailson: 40). To a substantial degree, the success of the National Atlas of Ukraine pilot project was connected with a high technical level. The high quality of the product designed within the project was recognized by the Academy of Sciences of Ukraine. As a result, the Institute of Geography organized a stand that illustrated geo-informational technologies development in Ukraine at the well known exhibition in Hanover, Germany:

[The firm "Intellectual systems GEO"] provided the possibilities of project implementation at a high technological level. In 2001, Institute of Geography and Intellectual systems GEO presented the CD-ROM Atlas of Ukraine at the International Exhibition on Geo-informational Technologies and Communications in Hanover, Germany. (Leonid Rudenko)

The Academy of sciences recognized this project as the one that characterizes positive informational sphere of research, implemented by the Academy of Sciences. In Hanover, the well-known exhibition of informational technologies is held. In 2001, Rudenko was invited for this exhibition. I was also there. Institute of Geography was supposed to organize the stand devoted to informational technologies. It was really noticeable that the Institute of Geography was supposed to do that. This was due to the product we designed. (Viktor Chabaniuk)

Another important success factor stated within the interviews was the importance of National atlas for the state and the fact that the Institute of Geography was working on this idea for a long period of time, but lack of funding did not allow implementing their idea earlier:

The project of National atlas became successful by itself. Most probably, this was due to Rudenko, who was interested in this issue for a long time. (Viktor Chabaniuk)

This project was successful, first of all, because it was necessary for our state, for our people. (Leonid Rudenko)

Comparing National Atlas project with the other information system development projects provides an in-depth look on the factors that contributed to the success of the former and lack of success of the latter.

### *Information systems development projects*

Though the EMIS, REMIS, BEMIS, and DEMIS systems were created at a high technical level, these systems were not successful at the stage of their implementation:

If to speak about system creation we achieved more than we planned. We made a good final product. As for its implementation and use, I think the objectives were not met. (Olexander Kolodiazhny)

Among factors that made it difficult to use REMIS at a policy level, the fact that it presumed *basin management* was mentioned. According to the scientific research leader of the project Olexander Kolodiazhny, basin management had been already declared in the Law on Environment Protection. And, REMIS was aimed at the informational support of the basin management. In reality, declared basin management did not exist:

We were trying to introduce basin management. This task is global and difficult to reach. We did not reach basin approach in Ukraine yet. It is necessary to move towards basin management. However, to do so, we need not only the understanding of the officials of the Ministry, but also understanding of the President and parliament. (Anatoly Shmurak)

Since state power in Ukraine remains centralized, the oblast to oblast relations in data exchange are problematic. The director of the Eco-Center in Zaporizhia Valery Golovin sees the problem of data access as a major constraint for efficient REMIS implementation:

Unfortunately, regions were concentrated on their own problems, and implementation of basin management turned to be problematic. We get the information from Zaporizhia oblast efficiently. Other oblasts provide information with a delay of one year. We get the information indirectly, through the State Committee on Hydrometeorology and the State Committee on Water Economy. (Valery Golovin)

In such a way, REMIS project "outstripped the time" (Olexander Kolodiazhny). It presumed basin management that did not exist. As a result, it had been used at the level of Zaporizhia department of environmental protection only.

During the interview with Viktor Chabaniuk, other important factor that was not presumed by the EMIS-DEMIS systems as opposed to the National Atlas project was mentioned. The key difference between these projects was connected with the fact that while the National Atlas project was oriented towards a wide audience, the EMIS-DEMIS systems were oriented toward particular structures, therefore, in the situation of constant changes, that is peculiar for Ukraine, these systems could not be efficient:

REMIS-BEMIS were oriented toward a particular structure. This structure constantly changes. New people come, and they do not use the system. Let's take the Ministry of Extraordinary affairs. How would it be possible to automate the system if one day, they said that 17 people worked at their department, and, the other day, only 9 stayed. Functions of 8 people who leave should be transferred to another department, and the rest 9 people should take more functions. The system was created for those 17 people who initially worked at the department. And, when such changes occur, system should be rewritten... The audience should be wider. ... Atlas was a successful project. And this was due to the fact that it was not oriented towards a particular structure. We tried to influence a system, a Ukrainian society as a whole. (Viktor Chabaniuk)

Additionally, the particular structures, the systems were designed for, could not support these systems:

Ministry has different functions, and it cannot support the system. Ministry can be a user only. (Olexander Kolodiazhny)

Following Viktor Chabaniuk, the following design should be followed for the information systems projects to be successful:

- creating a product, better if this product will be oriented towards a wide audience;
- understanding a business process in Ukraine as a whole, and in particular organization where this product will be used;
- public presentation: publications about the product and processes (web sites, CDs) (such presentation should be planned from the very beginning);
- providing a common glossary (this refers to EMIS, REMIS, BEMIS, DEMIS);
- discussing the service of the system from the very beginning

Similar factors of success were defined in Darko Poletto's report (1998):

For an information system to be effective, several components must work together. These include data, applications, technology, people (users), and management structure... A management review ... should look specifically at the client needs being met and addressed, and the willingness / ability of the Ministry of Environment to accept, implement, and maintain the system within its organization. (Darko Poletto 1998)

Thus, the EMIS-DEMIS systems, have not been intensively used at a policy level, as it was presumed at the stage of their initiation. The factors that hindered their use include:

- a presumption of basin management, that though stated in the Law on Environment Protection, was not implemented in practice;
- an orientation towards particular structures that are unstable in Ukrainian environment;
- the inability of the Ministry to maintain the system; and
- lack of understanding of information systems by decision makers (see Section 4.2.2)

In terms of Weiss' three models of research, the model of *research as data* in case of informational systems' projects did not work efficiently. At the same time, one cannot state that this research was useless. And, the reason why, is: it brought to the accumulation of research to shift the prevailing paradigm. These projects facilitated the information exchange, they overcame a prevailing Soviet paradigm that presumed keeping information in secret. A one project could not lead to such a shift, but all of them brought to the realization of the necessity of information exchange facilitation:

A one single project could not change this situation. But all of them taken together did change the situation for the better... Each project was a step towards transparency. Each time, within the projects, participants realized that existent system does not facilitate efficient information use. People realized that this system [meaning institutions that do not share information] should be destroyed. (Alexei Shmurak)

Collaboration with the IDRC brought us to the understanding that the information should be available. Now, we will be ready to share even when the information we provide is not published in scientific journals yet. (Volodymyr Osadchy)

These projects made a step towards overcoming a *soviet caution*, a paradigm that was prevailing in Ukrainian society for many decades. And, as such, they can be considered as being used as *research as ideas*.

#### 4.1.3. Maintaining scholarly standards and providing bases for education

In contrast with many countries in the south, education in Ukraine (and in other post-communist countries) was widespread and diverse. Scientific institutions operated within a well-structured system (see Final Report to the Canadian International Development Center (EMDU-2)). However, as we stated earlier, the protracted economic crisis in Ukraine caused the situation when scientific research was not considered as a priority. Many interviewees commented on the lack of funding at the institutions of the Academy of Sciences of Ukraine during the program's implementation:

Researches were not carried out at the institute [of Hydrobiology] due to lack of financing. In 1994-1996, we were paid 50% of the salary. Equipment was not purchased. In winter, there was no heating, the temperature was 3 to 4 degrees Celsius. (Viktor Archipchuk)

At that time, we already passed through the most severe crisis when we worked for 2 days per week, when salaries were not paid. (Alla Bochkovska)

The EMDU program was "just in time" (Natalia Movchan). Donor's financing provided an incentive to work and hope:

The International programs, and the IDRC program in particular, give us a hope. While we work in such programs, we get an incentive to continue to work and live. These programs allow not to fall in despair. (Kostantyn Chobotko)

It was amazing for us in the beginning that we had both enjoyable work to do and money paid for this job. People were ready to work on weekends. (Alla Bochkovska)

In many cases, IDRC provided support to the institutions that would not operate otherwise:

When we received a small grant, we got test cultures, we got task, and we got an opportunity to earn additional money. In such a way, our problem was solved. (Viktor Archipchuk)

The IDRC grants not only allowed to conduct a research, to stay at the level the scientific establishments had before, they provided an opportunity to acquire a higher level of professionalism. This was partially due a high requirements to the research quality imposed by the donor:

Darko Poletto was an expert and consultant for the project. He demanded a high level system. In the beginning, it was difficult for us to create a system at such a high level. However, as a result, our system did not go out of date till now... One can definitely state that this program allowed us to achieve a higher level of professionalism. We got computers, software. We had to study GIS [geo-informational technologies], Internet more precisely, and we learnt remote sensing. (Olexander Kolodiazny)

Thanks to the program, our level did not deteriorate, it improved. (Olexander Vasenko)

Some of the interviewees stated that their experience of the IDRC financed research allowed them to realize that their level of professionalism was high:

We realized that our Ukrainian scientists have a high level of knowledge and despite our poor technical equipment, we obtained results comparable with Canadian results. We obtained scientific and practical results: the polluted areas, the pollutants, and defined the tendencies for the future [*Baseline Water Quality* project]. (Volodymyr Osadchy)

Along with acquiring a higher level of professionalism, researchers got an opportunity to educate others on the basis of the program results. The post-graduate students influx to the scientific institutions was stimulated by the IDRC sponsored projects:

Program stimulated the post-graduate students' influx, because as a result of the program, we got an information necessary for a scientific work [*Baseline Water Quality Study*]. (Volodymyr Osadchy)

We work here for a year, but we already have post-graduate students from other countries. Our post-graduate students were invited for the conference in France. Within one year, we achieved a lot, and this is thanks to the *WaterTox* program. (Viktor Archipchuk)

The program resulted in publication of the textbooks and program results' incorporation in the educational process:

After the official completion of the Program, we have not stopped our activities and continued to work. One of the directions of our activities is the development of ecological educational structures for officials. The series of textbooks were issued. (Vasyl Navrotsky)

The textbooks were prepared and used in the universities, in the system of training and re-training professionals. (Vasyl Shevhuk)

The technology of waste water sediments processing was presented in the textbook. A course of lectures is conducted at the Agrarian University. In such a way, students are taught the possibilities of biotechnology use in environmental protection. (Kostyantyn Chobotko)

Within the program, we prepared publications that form the basis for educational programs at the universities. In particular, the textbook on hydroecology [Romanenko, V.D., "The Bases of Hydroecology"] was first published in Ukraine, Russia, and Belarus. This book was published by the State Fund of Fundamental research of Ukraine. ... Though it was published through another fund, the preparation of this book was stimulated by the program. (Viktor Romanenko)



The summarization of the program's impact on the researchers in Ukraine was expressed during the interview with Natalia Movchan: "Now, we have people who went through such a school. And, this is our state's gain."

#### **4.1.4. Supporting recipients to develop innovative ideas. Organomineral Fertilizer Production Project**

The city of Zaporizhzhia experienced ecological problems. One of them was connected with the lack of knowledge on sediments' processing. And, this problem was acknowledged by the decision makers:

We had ecological problems. We did not treat waste water sufficiently, and Nikopol [city down the Dnipro river] had to treat this water for drinking purposes. We separated water and sediments. However, the problem stayed, it was necessary to do something with those sediments. (Volodymyr Razguliaev)

Sediments' use could allow eliminating adverse effects of waste on environment and providing inexpensive and ecologically safe organomineral fertilizer. However, though the other countries experienced the same problems, this area of research was not developed:

In other countries (England, Denmark) these sediments are either burnt, or buried in the sea... Ukraine was the first country in the world that initiated such a practice. (Kostyantyn Chobotko)

The problem was acknowledged by the decision makers and there was the scientific institution (Ukrainian Scientific Research Institute on Melioration and Water Economy) willing to conduct a research in this sphere. The major constraint lied in lack of budget financing. Therefore, IDRC financial support was extremely important:

Financial support was extremely important. Without a financial support, we would not have an opportunity to implement such a project. (Kostyantyn Chobotko)

Research team, created by the project manager Kostyantyn Chobotko, compiled a competitive proposal that allowed them to get the IDRC financing. According to Kostyantyn Chobotko, if the project proposal was not good enough, it would not pass. In general, high level of professionalism required under the EMDU program was important for successful project implementation:

Improper work could not pass through. (Kostyantyn Chobotko)

The project was a success: the composition of sediments was studied; the technology of their use was worked out; the pilot equipment was created; the normative basis was compiled; and the textbooks were issued. In addition, project's results showed the ways of resolving another problem in Zaporizhzhia. Organomineral fertilizers allowed planting grass and trees in the district with low soil fertility:

In Zaporizhzhia, we had a district with low soil fertility... It was extremely difficult to plant grass and trees there. And, project allowed to resolve this issue. (Volodymyr Razguliaev)

We planted trees and grass in the districts with low soil fertility. Now, people in Zaporizhzhia say that it is a nice place to walk. (Kostyantyn Chobotko)

The project also resulted in working out the *Program of Implementation of Organomineral Fertilizer Production and Its Use in Agriculture*. This program has been approved by the State Committee on Construction, Architecture, & Housing Policy, Zaporizhzhia oblast sanitary epidemic station, and Zaporizhzhia ecological department.

The example of lobbying the issue of sediments' utilization was given to illustrate the way IDRC sponsored projects influenced public policy:

When we tried to resolve the problems within the project, we had to make changes in standards and laws. We approached Verhovna Rada with an issue of sediments utilization in order to get their interest and attention. If I take care of this problem, why should I pay the same amount of money as Dnipropetrovsk [that does not take care of this problem]? In such a way, we influenced policy. In such a way, others influence policy. (Volodymyr Razguliaev)

Lobbying these issues did not bring to changes in legislation yet. However, in Ukraine (where "initiative is punishable"), the fact that these issues were lobbied seem amazing by itself. Research brings to understanding the necessity of changes. And, actual changes require this understanding as well courageous people ready to fight for their ideas.

## 4.2. Broadening policy horizons

### 4.2.1. Providing opportunities for entering the international scientific community and looking at Ukrainian practices from a comparative perspective

Ukrainian research institutions did not use internationally recognized standards. And scientists found it difficult to meet the standards' requirements of the IDRC. In addition, while the IDRC employed international standards, the UMC that consisted of Ukrainian researchers and officials, continued to employ Ukrainian standards. And, the project proposals had to be approved by both sides. Sometimes, researchers compiled two different documents that were close in subject, but different in form. This brought them to the realization of the necessity to introduce the internationally recognized standards in Ukraine:

One of the problems was as follows: the standards in Western countries and in Ukraine are different. And, Ukrainian and English drafts of the proposal were not identical... I had to compile two different documents: one, to satisfy the Canadian side, and the other, - to satisfy the Ukrainian side. They were close on a subject matter, but had different forms of presentation. There is a problem here. I think that Ukrainian standards should get closer to Canadian standards. (Olexander Kolodiazhny)

Researchers appreciated the experience they received in the EMDU program, which allowed them to become acquainted with international standards. Though Ukrainian researchers found it difficult to learn these standards, they also found it extremely useful: now, they have a knowledge that allows to prepare competitive project proposals:

Why we have difficulties to get grants? We do not fully understand the requirements of Western standards. And, the IDRC projects helped us to learn the language of donors' organizations, their requirements. (Olexander Kolodiazhny)

The researchers got acquainted with the international level of project proposal development. This is the issue that was not known in our country before the program. How to present the project in such a way that it will be competitive? It was a good school. And, we learnt it with many difficulties. We changed the projects for 5-7 times unless they corresponded to the international standards. (Viktor Romanenko)

The program allowed to get acquainted with the international level of projects' preparation and reporting. The IDRC scheme was strict, and it was useful for the program itself as well as for the scientists in applying to the other programs. (Anatoly Stashuk)

Learning international standards was also important since it provided an opportunity to enter the *international scientific community*. In some cases, researchers who were involved in the EMDU program, reached a considerable success: they published their articles in Western scientific journals, they made presentations at international conferences, and their level of professionalism was acknowledged by Western colleagues. And, they tie their success with the experience they gained within the EMDU program:

We started to publish the results in Western countries. We realized that the level of our work should correspond to those standards. We started to make presentations at International conferences. We initiated contacts with Western scientists. This support allowed us to enter the International community of scientists. Last year, I have been included to *Who's Who* and *Who's Who in Science*. I think this is also due to the program. (Viktor Archiphchuk)

As indicated by Viktor Archiphchuk, the program allowed initiating contacts with Western scientists. In many cases, these contacts became possible through financing training in Canada:

The IDRC project allowed establishing partners' and even friendly connections with the CRA. We with Sverdlikov have been to Canada in connection with [IDRC financed] projects. (Gennady Scherbina)

Darko Poletto organized my trip to Canada... We established and maintained good relations with Darko Poletto (firm SKE) and with the collaborates of the firm *Spectrum Analysis*. (Olexander Kolodiazhny)

Initiating contacts within the EMDU program often resulted in collaboration within other research projects. In particular, the director of the Municipal Economy Research and Technological Institute (MERTI) stated that now, his institute in collaboration with Canadian partners CRA, Waterloo made a joint proposal on the landfill study project in Yalta, Crimea. This proposal is under CIDA consideration now. Head of the Environmental Department of Zaporizhia city council Igor Broide stated that they continue to collaborate with their Canadian partner *Gartner Lee*, consulting firm in the sphere of ecology:

We started to collaborate within the IDRC financed project [Training of Environmental Entrepreneurs project]. And, the ECOLINKS project was implemented together with Gartner Lee... I consider this project as a direct continuation of the IDRC project. (Igor Broide)

Along with facilitating entering the international scientific community, training in Canada allowed to look at issues from a different perspective. Sometimes, these trips allowed to get acquainted with different approaches. And, they brought to understanding that the Ukrainian centralized practice of resolving the problems in a one standard way throughout the whole country should be changed:

During our trip to Toronto, we got acquainted with different ways of waste collection. Each city resolves this issue differently (both organizationally and technically). In some places, municipal companies collect waste, in others, private companies collect the waste. We realized that it is not necessary to focus on one approach and to implement it all over Ukraine. Each city can do it differently. (Igor Broide)

These trips allowed to get acquainted with Canadian way of doing things and to look at Ukrainian practices from a comparative perspective:

We got acquainted with Canadian legislation in the sphere of ecology. In Ukraine, we have strict norms of waste and pollution. And, enterprises do not follow these norms. We are happy that we have the strictest regulations that were inherited from the soviet times. At the same time, no one follows these regulations [Why?] There are no means to achieve these norms. If enterprises do not work, the level of unemployment will increase... Norms in Canada are less strict, but everyone follows them. It is not necessary to adopt strict norms; it is necessary to have legislation that is feasible to follow. This is connected not only with the sphere of ecology, but also with all the spheres of society. (Igor Broide)

Two trips to Canada were extremely important for our work. We learnt how these issues are considered in Canada. We also got acquainted with the activities of mass media, Ministry of National Parks of Canada, and some aspects of municipal economy and ecology. This showed us the directions of work, as well as provided a comparative perspective... (Yury Pavlun)

Within the framework of the program, IDRC sponsored the *Training Ukrainian Environmental Entrepreneurs* project. Thirty-three trainees attended a 5 days seminar in Kyiv in August 2000, 9 of which were invited to come to Canada in September 2000<sup>ix</sup> (see Gartner & Locatelli 2000). During the first week, formal training was conducted in the Gartner Lee classroom. During the second week, the trainees were placed with different consulting firms within the Greater Toronto Area. Evaluation of the program was presented in Gartner & Locatelli (2000), and it was stated that the program was a success. Our study revealed that except achieving its goals, this project (as well as other projects implemented in collaboration with Gartner Lee) led to changes in approaches of the trainees. One of the project's participants Igor Broide stated:

My approaches changed. Now, I am trying to computerize everything. And, now, we have the most powerful computer basis. And, our staff use computers efficiently. I was surprised by the way expenses are count in Canadian companies. In particular, in Gartner Lee, each collaborate has his own code in each project for copying. If he does one copy more, this will be taken from his salary. Now, I realize that such small things are important. My views on personnel management changed. Now, there is more freedom in my relations with personnel. Before, we had boss-subordinate relations. Now, we have more democratic relations at the office. (Igor Broide)

Knowledge gained through trips created a *paradigm shift*, that can be illustrated by the quote from the interview with Volodymyr Razguliaev:

Visits to Canada were useful: it was better to see once than to hear many times... We got acquainted with Western technologies, Western attitudes to the consumer, and the consumers' attitudes. Sooner or later, it brought us to willingness to improve our own Vodokanal. It brought us to a willingness to provide a deserved service that was connected with better water quality, attitude towards consumers, and attitude towards environment protection. We reconsidered our approaches. (Volodymyr Razguliaev)

The program has been "the window for Ukraine to see and experience Western technology and Western ideas" (Myron Lahola). This was particularly valuable for the country that was closed for many decades. Stimulating cooperation between and among different organizations and institutions within Ukraine was equally valuable since the lack of cooperation had a negative consequences in terms of carrying out identical work by different institutions, double subordination<sup>x</sup>, and the situations when "the right hand does not know what the left hand does" (Kostyantyn Chebotko)

#### 4.2.2. Stimulating dialogue between and among decision makers and researchers

In Ukraine, the problem of under-utilization of research in the policy process can be seen in terms of 'two communities' model (see Neilson 2001: 4). A substantial amount of funding was allocated to research during Soviet times, but, as interviews with policy makers reveal, this research was academic in nature and did not provide concrete recommendations:

Our scientists are spoiled by the Socialist system. They like fundamental (as opposed to applied) research. Fundamental research is more interesting. Working out an instruction or regulation is boring. And, applied research presumes a responsibility, because it presumes a concrete result. (Natalia Movchan)

While working out regulations, we order research first. However, in our opinion, scientists do not answer directly usually. They should give concrete recommendations. (Kemal Aliev)

Thus, decision makers see lack of concrete and applied scientific research as a major constraint for its utilization. At the same time, researchers see the reason for the latter in the inability of the decision makers to think globally, to define their needs, and to realize the importance of the issue:

Unfortunately, we have problems with the policy influence. This is mainly connected with the fact that authorities do not understand exactly what they want. While working in REMIS, I approached them and asked them to define their needs... The answer was "I would like to push the button and get everything

immediately". In my opinion, decision makers do not think globally. They have some minor questions necessary to be resolved. (Olexander Kolodiazhny)

Unfortunately, our officials have not come to the understanding that informational technologies should be used in the decision making process. (Olexander Trofimchuk)

Lack of interactions between and among researchers and policy makers was one of the reasons of under-use of research in policy making process. And, one of the ways, EMDU program addressed this issue, was facilitating cooperation among organizations and institutions.

#### **4.2.2.1. Enhancing management through facilitating cooperation among organizations and institutions**

In the case of informational technologies projects, the problem of the system not being used was seen as a consequence of the basin management imposed by the system, orientation towards particular structures that are unstable in Ukrainian environment; the inability of the Ministry to maintain the system; and lack of understanding of the issue on the part of policy makers (see Section 4.1.2). Within other projects, the problem of disconnection between policy and research was frequently seen as a result of lack of coordination among the universities, the institutes, the ministries, and local administrations. Unless, research institutes were directly subordinated to a particular state body (as it happened, in particular, with the Municipal Economy Research and Technological Institute (MERTI)<sup>xi</sup>). An interesting example was provided during the interview with Myron Lahola:

In the early stages, I was in Zaporizhzhia at the water treatment plant. One of the fundamental water treatment processes is coagulation... This is something so fundamental that in Roman times, the Romans used coagulation in their water treatment process. In Ukraine, in Kyiv, there is an Institute for study of Colloidal Chemistry and coagulation. I went to this institute. There was highly developed, highly advanced research being done, while ironically, at the water treatment plant, they did not know how to add coagulant to the water. It was amazing to me that here you have 500 kilometres away, in another city this institute that is all about the coagulation chemistry, and there this water treatment plant struggling with the coagulation process in the water. The two were totally disconnected.

The program addressed the issue of disconnection between different organizations and institutions. This was done, first of all, by the way program was managed. As we noted earlier, the Ukrainian Management Committee consisted of high-level officials and the directors of the research institutes. And, the Committee itself was useful to facilitate the collaboration among different organizations and institutions.

Within many interviews, the program as a whole was seen as a mechanism of uniting governmental organizations, public organizations, and scientific institutions:

Projects, implemented in collaboration with the other institutions, served as a mechanism of uniting ... Projects facilitated our collaboration with the governmental structures, in particular with the State Committee on Housing and Municipal Policy (formerly, State Committee on Architecture). The process of uniting different institutions was initiated within the program financed by the IDRC. (Volodymyr Osadchy)

Collaboration with IDRC allowed to look at the issues of Dnipro on a broader basis, to develop the collaboration among and between public organizations and scientific institutions, and to develop this collaboration openly. (Anatoly Gritsenko)

The program also brought together research institutes of Ukraine that had not been working together before:

The program united the institutions that never collaborated before. Everyone worked separately: my institute was working on water issues, other institutes dealt with different issues, for example, Goncharuk institute dealt with water quality, Romanenko was responsible for water biology, Osadchy collected the information on hydrometeorology. Within the IDRC program, all of us united our efforts to provide a complex approach in resolving the ecological problems of Dnipro River. (Anatoly Yatsyk)

During the program implementation, we established good contacts with the representatives of other scientific institutions. (Anatoly Chervony)

Following the opinions of the interviewees, one can state that the program made a step towards uniting different organizations and institutions that are working on the issues of environment protection and water supply by the way it was managed and by conducting joint research.

As Caplan suggests, increasing the use of research in policymaking could not be achieved by merely increasing interactions between policy makers and researchers. It is important to achieve a 'relevance' of research (see Neilson 2001: 4-7). Within the EMDU program, such a relevance was achieved through "learning applied side of a science" as Myron Lahola named it.

#### **4.2.2.2. Learning applied side of a science**

Researchers and research institutions in Ukraine did not have the experience of utilizing the results of their research. At this point, Western and Soviet understandings of the notions of science and scientific research were different:

The way we approached it, research was defined in terms of studying and learning about an issue as opposed to research as the Ukrainians tended to view it as scientists in the laboratories doing highly secret kinds of research into new inventions. From that point of view, the Ukrainians did research. But, the research we found, was disconnected from the policy process. The research tended to be theoretical and empirical as opposed to applied. When we arrived here, we found that there was a very highly educated population doing research often times more advanced in some areas than what was done in the West. The problem was that this research was often more theoretical and empirical rather than applied. (Myron Lahola)

Within the program, researchers got acquainted with the "applied part of science":

We had the task of explaining them, or trying to convince them that technology does not necessarily answers everything. In other words, it is not how to use it (technology), but rather how to manage it that makes the difference between success and failure. Our task and often our challenge to show Ukrainians that just because you have technology at your disposal, it is not necessarily the answer, or the means in and of itself. (Myron Lahola)

Our researchers got an opportunity to conduct research. And, they had to convince others that their research was useful. (Natalia Movchan)

There were many scientific researches implemented under the IDRC financing. I cannot say that all of them had been used in practice, but most of them were applied. (Kemal Aliev)

Particular directions of research within EMDU program provide the examples of learning an applied part of science. Here, we consider the projects on biotesting (WaterTox battery) and Information systems development projects.

#### *Biotesting*

If to take the projects on biotesting (WaterTox battery), in the beginning, Ukrainian researchers saw it as something not sophisticated enough:

We were introducing to them techniques for rapid determination of water quality using organisms that were not very sophisticated but handy: some bacteria, some onions, and daphnia. The way, the Ukrainians saw this was: "They are showing us some old technology, we are going to the moon already, and they are showing us these old ways of doing things." Researchers could not see it in the entire context. Of course, there is very sophisticated, using expensive machinery analysis. However, what is really important in judging the water quality is that is fast, simple, and can be done in the field. These were tests that were being introduced in many countries of the world with the results being rapidly comparable. By this example we demonstrated that selecting the appropriate technology is more important to achieving results (i.e. safe drinking water) than focusing on technology in isolation. (Myron Lahola)

Ultimately, researchers were involved in the study, and they saw the importance of that research. While answering the question concerning WaterTox being yesterday for Ukraine, Viktor Archipchuk stated:

I do not see any scientific grounds for such a critique. We just exchanged several organisms to the others. And, the choice of the organisms depends on technical possibilities. ... The concrete set of organisms depends also on technical tasks (what we study...) For my publications, Canadian battery was appropriate.

And, the “lack of complexity” in this particular research had another (besides practical use) positive consequence. The results of the project were implemented in the project *AquaTox 2000*:

All the batteries used in WaterTox are simple enough to be used by schoolchildren. ... This program was implemented in 26 countries of the world. We took the patronage over two lyceums in Kyiv. ... Each quarter of the year, schoolchildren sent their results to Canada. In the first quarter of the year, our schoolchildren won. (Viktor Archipchuk)

Overall results of the WaterTox projects proved the necessity of different biotests use, depending on a concrete case and a concrete task (Dnipro Ecological Rehabilitation 2001: 99).

#### *Information systems development projects. Sophisticated versus applied*

While speaking about sophisticated versus applied character of research, *Information systems development projects* are worth mentioning. The paradox of these projects was connected with the fact that the least technically successful project had been used most intensively. While, all the interviewed computer scientists stated that technologically, EMIS-DEMIS projects were implemented at a higher level than the *Interdepartmental Database* project<sup>xii</sup>, it turned out that the latter was used more intensively. Darko Poletto recommended EMIS-DEMIS approach in creating a Dnipro system, but in his technical review he pointed out, that it seemed unlikely the EMIS application tools would be used directly by the Ministry of Environment protection because of the complexity of the tools (Darko Poletto 1998). Olexander Kolodiazhny, project scientific leader expressed the same opinion:

Our system turned out to be too complicated for decision makers even though we prepared a manual for our system. (Olexander Kolodiazhny)

As for the Interdepartmental database, according to the manager of this project, Volodymyr Osadchy, it has been used (available at the Ministry, used at the Ukrainian Research Hydrochemistry Institute) due to the fact that its users were its developers:

The informational system, we worked out, is not as difficult to use as DEMIS, REMIS. The former works, because it was worked out not by scientists-ecologists. The success is possible when the scientists of the narrow sphere solve the concrete task. We had a concrete task (data collection, data processing, and analysis) that we solved. (Volodymyr Osadchy)

Thus, the EMDU program showed that the most sophisticated and the most technologically advanced research was not necessarily the most valuable one.

#### **4.2.2.3. Changing attitudes of decision makers**

Our consideration of stimulating dialogue between decision makers and researchers would not be complete if we did not take into account the way, the EMDU influenced the decision makers.

Ukrainian officials are sometimes reluctant to use research in the process of decision making. Lack of data and information in developing countries, “also means that challenges to government decisions are easier, in the absence of concrete evidence, and likely to be more politically oriented. As a result, political power tends to be the central determinant of policy outcomes and implementation,” (Grindle and Thomas, quoted in Neilson 2001: 16):

The scientific research influences policy... We try to use research. However, we do not like doing that. It is a difficult task and we do not have enough personnel. We need scientific research. However, all these procedures take too much time. At the first stage, when you receive an initial report, it takes time to review it. Sometimes, report does not correspond to a technical task. We do not have enough people to review all of that. We have only 12 people at the department. (Natalia Movchan)

Policy makers are sometimes reluctant to use the research results due to lack of financing and not willing to acknowledge that foreign assistance might help to resolve the problematic issues. The negative attitude of some policy makers towards implementation of the program's results was stated during interviews:

I have met with the Head of Zaporizhia city administration... He said that our work was impressive, but they had other important things to do. (Olexander Trofimchuk)

*Pilot projects* can be seen as the way to convince the policy makers of the value of research results. And, National Atlas project may serve as an example for the latter (see section 4.3). At the same time, in many cases, pilot research brought to outcomes, the most valued aspect of which was connected with rather purchasing equipment than introducing a new form of solving the issue that is widely disseminated afterwards, or finding the optimal solution of the problem. As indicated by Jean Guilmette, "scientists and managers alike tend to focus on technological fixes to problems, rather than adjusting management practices where practical." And, some interviews illustrated such a tendency:

I think that the number of pilot projects should be larger. More equipment should be worked out. We did not manage to convince the Canadian side that the pilot projects were more important. The research projects were "easy going" [easily approved by the Canadian side]. And, the pilot projects were not as easily approved. And, I think these issues should be financed... For example, we do not have ship-excavator for cleaning rivers. And, this excavator is essential for small rivers. There are no money in the budget to cover the expenses for such excavator. I think such projects are more important. Less recommendations and advises and more equipment... (Kemal Aliev)

This attitude was especially visible in ecological audits projects, where the equipment was planned to purchase before an audit had been conducted. *Plasma story* provided by Ken Babcock (see Appendix), illustrates this point. The IDF, that was implementing an environmental audit at the Vatutino meat processing plant, was insisting on using high-energy plasma to treat waste. According to Ken Babcock, most probably, such an attitude was caused by a willingness to please the Minister. The IDRC refused to fund the expensive plasma based equipment since its research indicated that it would be impractical. The unwillingness of the IDRC to follow the decisions that contradict the research findings may serve as an example of *research as argumentation*. The IDRC managed to convince the IDF director that plasma technology was not efficient for use at the meat processing plant.

The IDF director who managed several ecological audits' projects, stated that it was difficult to convince the management of the enterprises that they will benefit from the research. Sometimes, they were seeing ecological audit as a form of inspection. Sometimes, they were sure that they knew better what they needed:

When we came to the enterprises where ecologic audit was planned, first, we had to struggle with the Head, we needed to convince him that we came to help, not to check him in order to punish then. Heads were telling: "Give us money, we know how to use them". (Vasyl Navrotsky)

The task of convincing the directors of the enterprises in usefulness of ecological audit was challenging. However, as soon as managers saw the profit, they started to look at ecological audit differently:



However, after 3 days of work, we showed him the possibilities that had not been used before, and understanding was reached. It was difficult to make the Head believing in efficiency of ecological audits. (Vasyl Navrotsky)

According to the interviewed managers, the ecological audit projects allowed to decrease air and water pollution, and, in such a way, to decrease a tax burden. In some cases, ecological audit allowed introducing new directions of production:

Suggestions of environmental audit allowed decreasing energy use, blips [pips] into the atmosphere and water, the pollution of water, and tax burden for the sugar plant. (Ivan Katroha)

When we acquired this plant, we started to think about new directions. We did not destroy old technologies... However, this was just a continuation of our previous activities. We were intended to start something new. This was the most difficult... Now, we get our major profit at the expense of electrical filters production. The idea of this production was born during ecological audit. (Iosyp Muchnik)

In Zaporizhzhia Vodokanal, the ecological audit project addressed the issue of enterprises' water pollution control through creating the database of enterprises that use Zaporizhzhia system of sewage. The control presumed, firstly, the creation of an electronic database. (Before, this database was available in hard copies only.) Secondly, it presumed the verification of data reliability. And, the head of the department of Automized Systems of Management of Zaporizhzhia Vodokanal O.Bochko stated that the control system facilitated the efficiency of their work:

Now, we will have a possibility to trace a dynamics. Before, we had a lot of information in hard copies. The process of monitoring had been going too slow. (O.Bochko)

The low-cost measures, worked out during the ecological audit projects were for the most part, implemented at the enterprises. However, while stressing the success of the ecological audits projects, it is necessary to state that while at private enterprise Joint Stock "Experimental Mechanical Production Plant", all measures were implemented (as indicated within the interview with the technical director Iosyp Mychnik), at the state enterprise, Yagotyn Sugar Plant, some of the measures suggested by ecological audit though acknowledged to be useful, could not be afforded:

All low cost measures were implemented immediately... However, we were also suggested to work out the stations of water treatment equipment. This was too expensive for us; we could not afford it. ... At present, we have difficulties with financing. State does not have means to support our plant as a state institution... Therefore, the task of privatization is on agenda. (Ivan Catroha)

Ecological audit turned to be more efficient at the privatized enterprise. This was due to the owners' willingness to invest money to get a profit in a long term. At the same time, as interviews with enterprises' managers suggest, ecological audit allowed seeing the profit of conducting research before making a decision. And, as such, it made an impact on managers' attitudes.

The pilot projects produced the outcomes that were valued and since IDRC was not willing to sponsor equipment purchase without proving its adequacy, these projects were useful in showing researchers and enterprises' leaders practical ways of management. New knowledge gained through the IDRC projects was important as well. And, though a single project by itself could not bring to the paradigm shift, but as indicated within several interviews, such a shift became possible as a result of the EMDU program as a whole. In particular, in the interview with Vasyl Shevchuk, the results of the program could be seen as *concrete* outcomes of each particular project (knowledge gained, equipment purchased, and new directions introduced), on the one hand and, the *general* outcome of the program as a whole, on the other hand. The latter brought changes to mentality of the people, and was connected with the fact that they got acquainted with new principles and ways of management:

Within each project, new knowledge was gained... In general, we saw new principles of harmonic existence, new forms of relations among people, we gained fresh view on many things. I got a better understanding of the whole development. ... We realized that the policy should be aimed at harmony among different sectors of economy, natural resources, and in general, among people. (Vasyl Shevchuk)

The program changed the attitudes of the decision makers, especially those who were directly involved in its implementation – the UMC members:

Mostly, the UMC members were influenced, especially those who were UMC members for a long period of time. They learnt to work together, to accept other opinions, expressed by other Ministry, or by other institute. I believe, to take any important decision now, they will consult with their colleagues from the Academy of sciences and from different other institutions. The second kind of influence is that now they start to understand how to get information: web-site, personal relations, and even IDRC consultants. (Igor Iskra)

The disconnection between and among policy makers and researchers was addressed within the EMDU program in different ways: by the way it was managed and by conducting joint research; by stressing the importance of relevance and giving preference to applied versus empirical or theoretical research; and by trying to convince the decision makers to rather follow research findings than take inadequate decision. And, many researchers and officials who were directly involved in the program, learnt a lesson.

#### 4.2.3. Introducing new directions of study

Another program's accomplishment was connected with *introducing new directions of study*. As Olexander Vasenko stated, the program facilitated the development of some directions that will continue to develop. The bright example of introducing new directions of study was the *Ramial Chipped Wood* project.

The *Ramial Chipped Wood* project was initiated after a meeting of professor Gilles Lemieux (Forest Department, Laval University, Quebec, Canada) with the President of the Academy of Agrarian Sciences of Ukraine Ivan Shablii. Professor Gilles Lemieux was looking for the specialists who were qualified and willing to implement such research. And, Ivan Shablii had chosen the specialists from Boyarskaya Forest Experiment Station of NAU. They were offered to prepare a proposal. And, after several considerations at the UMC meetings, the project was approved.

As interview with the project manager Anatoly Chervony indicates, in the beginning of the research, its importance was doubted not only by policy makers, but also by researchers themselves. And, the major task of the first stage of the research was studying the possibilities of this approach and proving its importance. In other words, the implemented project was aimed at *knowledge generation* (see Neilson 2001: 9). Now, it is followed by a *policy relevant* research that is financed by the Cabinet of Ministers of Ukraine. The importance of policy relevant research in this case is connected with the necessity to see its efficiency for a concrete situation:

Before using this technology, it is necessary to conduct further research, because the results may be different depending on soils. (Anatoly Chervony)

The success of the project can be illustrated not only by the fact that now, this sphere of research is financed at budget expense. Researchers and policy makers acknowledged its importance:

At present, each year, 1.5 million tons of the chipped wood is burnt. And, use of our research may help utilizing chipped wood. (Anatoly Chervony)

We gained a new knowledge. In particular, we learnt Ramial Chipped Wood technology for improving agricultural fertility. This is a new technology that increases fertility and does not damage the environment. (Vasyl Shevchuk)

The results of these studies were published in many scientific journals, presented at conferences, and included in the curriculum of the Boyarka Institute for the officials of forest economy. The specialists of Boyarskaya Forest Experiment Station of NAU are preparing their doctoral theses based on the results of this study.

And though the results of this project are not used in the enterprises, the forecasts are optimistic:

It is early to speak about the use of this research in forest enterprises. However, I think, it will be used in the future. (Anatoly Chervony)

*Ecological Audit* projects described above as *research as argumentation*, can be also seen in terms of introducing new directions of study since ecological audit was never used at Ukrainian enterprises before:

New developments are connected with the system of ecologic audit. In working out the system of ecologic audit, we used Canadian knowledge and transformed it taking into account the Ukrainian conditions. (Vasyl Shevchuk)

Methodology of ecologic audit in Ukraine was worked out and tested in the concrete projects on light industry audits, agro-industrial complex, and enterprises of Zaporizhzhia region under implementation of the EMDU program (Dnipro Ecological Rehabilitation 2001). Introducing the issue of ecological audit through research at particular enterprises was supplemented by initiating new courses at the Universities, conducting seminars, presentations, and publishing textbooks:

The information was presented at the press conferences. We had publications in newspapers. We were invited to conduct seminars in Russia. This assured public awareness... We conduct lectures, participate in seminars, and share our experience... With our help, the educational course on ecological audits has been initiated at the Universities. The conception of ecological education was worked out within the Ministry of Education (Vasyl Navrotsky)

As we state below, the Ecological Audit Projects also resulted in the development of the draft law (see section 4.3. for details).

#### **4.2.4. Public involvement and public outreach**

The program experience in the aspect of public involvement and public outreach was a noticeable example of differences in Western and Ukrainian approach in dealing with people. Soviet policy makers never considered public outreach in any undertakings. And, in the beginning of the program, following “a good soviet tradition”, Ukrainians did not foresee the public involvement aspects. And, this can be illustrated through the experience of the *Riverbank Stabilization Project*:

Simple example with River bank stabilization project. We gave all the power to the project manager Sakevych, who started to do it in Soviet style approach: brought machinery and started to work. He even did not consult with local authorities. Somebody told that Canadians bought all the territory: all five kilometres, people were misinformed. They were alerted: they came out with the pitchforks to defend their land. So, we had a scandal, and our project was delayed for one year. (Igor Iskra)

People came out, they saw our group there, there was some official delegation coming out. They came out and I talked to them. And, they came up with things like “Canadians are buying up our land here. Soon, they are going to be building buildings, and we will never get to the river anymore.” ... I know that the Ministry got a lot of complaints from the villagers there. (Myron Lahola)

Giving all the power to the project manager Sakevych can be seen as an oversight. At the same time, if the IDRC pushed the right way to do things, this project would never bring to a valuable learning experience. As a result of this project, Ukrainians (UMC) learnt to include public participation and public awareness in project proposals. And, this was something they learnt, not taught to do:

In our evaluation of the project, which was done by the UMC, we said that there seemed to be a big oversight here with respect to involvement of the people... Subsequent to that, there were two projects done ... in another village, which was going to have an impact on the people. And, the Ukrainians themselves included public awareness and public participation in the proposal. So, it obviously had an impact on them.

The realization of the necessity for public awareness and participation came through the other projects as well; in particular, the *Drinking Water Law Project* and the project that financed the *Technical Economic Substantiation of the EBRD loan* (completion of the latter was financed by the IDRC, see section 5.3). In the former case, public involvement allowed to lobby the issue that would not be included in the Drinking Water Law otherwise. In the case of Technical Economic Substantiation of the EBRD loan project, it convinced the vodokanal officials in usefulness of work with people:

Within our work, we paid attention to public participation. Three seminars were conducted. (One of them was financed by the Cabinet of Ministers of Ukraine) It was difficult to work with public. They did not always understand us from a professional point of view. At the same time, public participation helped us a lot. First of all, it helped us to form public opinion and, at the stage of consideration at Verhovna Rada, public managed to include one issue that we did not manage to include: prohibition of electricity cuts-off at water supply objects. (Gennady Scherbina)

In the beginning, we were forced to create a department to work with the population (this requirement was imposed in technical economic substantiation of the EBRD loan). Later, we realized its importance. After we had proven its efficiency, the same departments were created in Kharkiev, Dnipropetrovsk, and other big cities. Kyiv Vodokanal offered Popov, the Head of the Department on work with the population a position and an apartment in Kyiv<sup>xiii</sup>. (V.Razguliaev)

Thus, public involvement in projects' implementation though not considered as important in the beginning, turned to be highly appreciated by program participants. And, this learning experience through IDRC sponsored research can be seen as a *paradigm shift* from a Soviet style of not considering the public involvement aspects as valuable to the realization of public involvement benefits.

#### *Raising Public Awareness of Environmental Problems and Environmental Television Program and Videos projects*

Within a program, special attention has been paid to the creation of video materials devoted to the issues of Dnipro ecological rehabilitation. Raising Public Awareness of Environmental Problems and Environmental Television Program and Videos projects allowed producing a television and video series on the Ukraine National Program for the Rehabilitation of the Dnipro River Basin and disseminating information on the EMDU program. The above-mentioned projects followed the Yury Pavlun initiative: in 1994 he and his team made video materials devoted to the first Canadian-Ukrainian expedition:

It was my own initiative. I knew about the expedition and, at our own expense, an editor, an operator, and I went to Kremenchug to shoot the beginning and the end of the expedition. However, when Shevchuk saw us doing this, he asked the leadership of the expedition to involve us, and we got an opportunity to work on a half-legal (half-official) basis. On the basis of this work, we issued a program "*Ukraine-Canada: Dnipro will Live*". This program was shown at UTI. Then, we issued about 20 cassettes and distributed them among participants and interested organizations: Institute of Colloidal Chemistry, Institute of Hydrobiology, Kharkiev Institute, Ministry, and the IDRC. This was done at our expense. However, later, when we got the IDRC grant, we were allowed to compensate a part of our prior expenses.

In the view of the project manager, one of the important aspects of these projects' implementation was the IDRC requirement of being politically neutral in presenting the situation:

When the project was considered, we were informed that we should not take any position: either state or Green Party. Yarema Shuliakievych informed us that they were not intended to be political investors. Therefore, we should be politically neutral and to speak about common problems. In our country, sometimes, when we prepare the programs, we are asked to show them from a particular perspective. While working with the IDRC we got an opportunity to present the events in an objective way.

The projects presumed the creation of: movies series ("Dnipro – Zone of Anxiety"), 3 TV broadcasts ("Green Studio"), and video-materials "Ukraine – Canada: Dnipro will Live" (on the course and results of the Ukrainian-Canadian baseline study), "Dnipro Water" (on the issues of municipal economy in Dnipro basin), "Dnipro Tributaries", "Blue Eyes of Volyn" (on Shatsky national park), and on Dniprovsko-Orlivsky and the Black Sea bio-sphere preserves. All of the mentioned TV products were broadcasted on UT1 and on oblast TV channels. According to the interviewees, these projects caused repercussions:

Not only as specialist, but also as a TV viewer, I have been watching the fragments on TV that were not long, but very bright. (Iryna Trofimova)

I remember a good movie on Dnipro... This was Pavlun movie. (Natalia Movchan)

After the movies were created, UMC chairperson Vasyl Shevchuk initiated the activities aimed at movie dissemination among schools and children's ecological organizations:

At the second stage, when we agreed the subjects of our work with the Ministry and the UMC, Shevchuk proposed to find the financial resources and buy the equipment for certain schools. We bought video recorders and television sets to 4 schools: Kyiv school with advanced studies of ecological issues; Kanev boarding school; Zaporizhia school with advanced studies of ecological issues; and Cherson school.

According to the project manager Yury Pavlun, after the project was completed, several hundred of cassettes were distributed in the educational system, in particular, the National Ecological Centre of the Ministry of Education of Ukraine. As a result, these cassettes were disseminated among oblast ecological centers as well as stations of young naturalists.<sup>xiv</sup> And, after this stage, a lot of letters came to the TV studio "Eco-Dnipro" that allow to assume that these activities were not imperceptible:

We received more than 10 letters where people asked us to help their schools. There were many phone calls, teachers asked us to send the cassettes to their schools. When teachers meet, they discuss their work. In such a way, our work gained certain repercussions. One teacher from Cherkassy oblast analyzed the effectiveness of our program. She sent her notes on what was efficient, what was not, and what children gained from our program. Teachers realized that such qualified presentation is very efficient within the educational process. (Yury Pavlun)

#### 4.3. Program's Impact on Legislation

According to interviewees, the program's major achievement was connected with the research that was used for development in legislation:

I would say, an important IDRC result in improvement of environmental management was development of relevant legislation. (Myron Lahola)

We used a lot of information we received, first of all in working out the legislative, normative documents, laws necessary for our activities in Ukraine, in particular, when we prepared the drinking water law; we used the information generated under Canadian funding. (Gennady Semchuk)

On February 27, the *National Program on Ecologic Rehabilitation of Dnipro Basin and Drinking Water Improvement* was considered at and adopted by Verhovna Rada of Ukraine (Dnipro Ecologic Rehabilitation: 37; National program can be found in English at <http://nature.org.ua/dnipro/>, web-site designed under the IDRC financial support).

According to the interviewees, this program was worked out on the basis of the IDRC sponsored research:

If to consider the collaboration with the IDRC in general, I would like to say, that one of the most important issues was connected with working out and implementing the National Program on Ecologic Rehabilitation of Dnipro Basin and Drinking Water Improvement. This program was adopted by Verhovna rada. (Anatoly Gritsenko)

The program's results were used in working out the National Program on Ecologic Rehabilitation of Dnipro Basin and Drinking Water Improvement. This program was adopted by Verhovna Rada and has a status of law now. (Kemal Aliev)

IDRC program was a basis for Ukraine's National program (Olexander Mazurkevych)

Thanks to the Canadian program, the National Program on Ecologic Rehabilitation of Dnipro Basin and Drinking Water Improvement was considered and adopted by Verhovna Rada. This was our greatest political achievement. (Anatoly Yatsyk)

The National Program presumed support for the EMDU implementation (see <http://nature.org.ua/dnipro/>), and EMDU was facilitating National program implementation in turn:

I think that the IDRC projects' implementation substantially influenced the implementation of the Dnipro National Program, especially taking into account that state financing was not enough for that. Some of the aspects could not be implemented without the program. These were the projects connected with the formation of Informational system, the projects that allowed to receive the data on ecological condition of Dnipro Basin. The majority of the researchers did not have another opportunity to study these issues. (Olexander Vasenko)

All the projects followed the National Program on Ecologic Rehabilitation of Dnipro Basin and Drinking Water Improvement. (Vasyl Navrotsky)

At the same time, opinions of the interviewees on the issue of the National Program's implementation were different. On the one hand, within many interviews, it has been considered as important document for decision making process:

...resolving of many issues is implemented through national programs, and the *National Program on Ecologic Rehabilitation of Dnipro Basin and Drinking Water Improvement* is an example (Vasyl Shevchuk).

On the other hand, it was seen as a declarative document, that did not have institutional mechanisms for implementation:

National Program is a declarative document. There are no institutional mechanisms to implement it. (Lubomyr Markevych)

It is remarkable that the report on the EMDU at the board of the Ministry of Ecology and Natural Resources of Ukraine, "was reflected in full in the report to the Cabinet of Ministers of Ukraine on the course of implementation of the National Program" (Anatoly Stashuk). On the one hand, it can be seen as a high evaluation of the EMDU, on the other hand, it can raise doubts concerning the lack of achievement in implementing the National Program on the part of the governmental structures of Ukraine.

An important piece of legislation, the *Drinking Water Law* is considered as a consequence of the IDRC sponsored research by interviewees:

Initial work on the drinking water law (study of the experience of other countries) was financed by the IDRC. We managed to translate the law of the U.S.A., Great Britain, other countries of the European Union. The IDRC also financed our trips to Poland, Check Republic, and Hungary. This also served as a basis of our work. (Gennady Scherbina)

According to the director of the Municipal Economy Research and Technological Institute (MERTI) Gennady Scherbina, *Drinking water law* project was implemented at the request of the Cabinet of Ministers of Ukraine. Thus, in terms of Weiss' classification (Neilson 2001: 9) it fits into a *problem-solving* research. At the same time, the decision on financing such a project was arrived immediately. Instable Ukrainian environment was one of the most important reasons for that:

That project was presented to the UMC and IDRC a number of times. It was turned down for funding by IDRC as many times. The problem was that we (OCEEI management group) were reluctant to provide giant funding for a project that was basically to draft the law. There were a number of reasons why we felt that way... because in Ukraine the experience is such that, you can draft the law, but there is absolutely no guarantee that it is going to go anywhere. It can become an administrative exercise that may end up having no result. We did not like that part of it. What we did in the iterative process of proposal development, going back and forth, we came to a compromise, which is more in line with the methodology that IDRC employs, which was to fund the research required upfront in support of a draft law. (Myron Lahola)

After the project's implementation, the Municipal Economy Research and Technological Institute (MERTI) completed to draft this law. The State Committee on Housing and Municipal Infrastructure lobbied this law (or, in words of Myron Lahola, "put it through administrative hoops."), and on the 10<sup>th</sup> of January 2002, the law was adopted and signed by the President.

The importance of this law was not doubted within the course of interviewing:

This is the Ukrainian state law, and ... any by-laws and any other regulations have to cope within the scope of this law. This law designates the authorities for water extraction (that means all the surface water), as well as for drinking water (that goes to the consumer). Within the scope of this law, there will be a large number of so called normative acts (or, what we often refer to in the West as regulations)... And then, water law clearly specify the limitations for authorities, for municipalities, for the oblasts (provinces)... (Myron Lahola)

Alongside with the National Program and Drinking Water Law, several norms and regulations were worked out within the IDRC sponsored projects. In particular, the Methodology of Ecological Estimation of Surface Water Quality (1998) was worked out under IDRC financial support, approved by the Ministry of Environment Protection and Nuclear Safety of Ukraine and agreed with the State Committee on Water Economy and the State Committee on Hydrometeorology. Other norms and regulations were worked out under the IDRC financial support as well:

One of those regulations, which was part of the assistance through the IDRC grant was the regulation for water tariffs or the water utilities rates for the consumers that now is being ratified through the Cabinet of Ministers as one of the regulatory acts. (Myron Lahola)

Working out the ecological standards of water quality was one of the positive elements of our collaboration (Anatoly Gritsenko).

The process of working out regulations on the basis of the IDRC sponsored research is still in progress:

Today, we are working out two state standards. One standard is connected with drinking water quality. At present, Ukraine is still using the Soviet standard and developing Ukrainian standard taking into account the requirements of European standards. Another regulation we are currently developing is the surface water standards. Until now, there was no such standard in Ukraine. While working out the standards, we use the process worked out within the EMDU program. (Grygory Semchuk)

The next priority is the water quality standards. Those standards are now being worked out to bring them closer to the European standards for drinking water quality, European standards for surface water quality... (Myron Lahola)

Laws “On Environment Protection” defines *ecologic audit* development in Ukraine. The latter is also regulated by laws “On Auditing Activities”, “On Entrepreneurship Activities”, as well as by standards and regulations (Dnipro Ecological Rehabilitation 2001: pp.185-191). At present, the law “On Auditing Activities” provides legislative bases for ecological audit. The draft law on ecological audit has been developed within the framework of the EMDU program.

It is important to note that, in case of ecological audit, the initiative of changes in legislation and policy went from business people who started to realize the benefit of non-capital measures presumed by the former:

While in western countries, the initiative comes from the bottom, from the interested people, in Ukraine, the initiative originates from the top. However, business people started to understand the importance of environmental audit (one can buy an extremely polluted land plot, and it would not be possible to sell it later). There were already requests for environmental audits, though, the legislative basis is not yet formed (Olexander Vasenko)

And, though the law on Ecological Audit has not been adopted yet, according to the interviewees, it will be adopted in the nearest future<sup>xv</sup>.

Since last year, this draft law is in Verhovna Rada and passed first reading. Taking into account that there are some changes after the elections, it should be adopted by the new convocation. (Vasyl Navrotsky)

We talked about ecological audit. First, this issue was touched in the course of the projects. Now, this issue is considered at the legislative level. (Olexander Vasenko)

Changes in legislation were not always directly connected with the sphere of ecology and water resources in Ukraine. As we noted earlier, the former Head of Zaporizhzhia Vodokanal Volodymyr Razguliaev mentioned a law of 1937 according to which water supply of the cities should be kept in secret. Later, he added:

We had to change this law. And, we did so. I personally prepared a new draft law. Today, everyone, who comes after us, will not have such difficulties. (Volodymyr Razguliaev)

On the 1<sup>st</sup> of August 2001, the Presidential Decree on *National Atlas of Ukraine* was adopted. This decree has been considered as a consequence of the IDRC sponsored research. And, judging from the words of interviewees, the pilot version of National Atlas could be seen as another example of *research as argumentation*:

The major consequence was the Presidential Decree on Creation of National Atlas of Ukraine. If we did not have this pilot version, we would not have such chances to prove the necessity of such an Atlas. Before, we were trying as well. However, we did not manage to achieve such a result. (Alla Bochkovska)

I think that our project was the one that had the most substantial consequences at the policy level, because as a result of the project, the Presidential Decree was signed. (Leonid Rudenko)

The paradox of the National Atlas project policy influence was partially connected with the fact that high-level officials got acquainted with this product at the exhibition of informational technologies in Hanover, Germany (see Section 5.1.). According to Viktor Chabaniuk, a lot of Ukrainian officials paid attention to this stand.

Another interesting comment on lobbying this law has been made by the project manager Leonid Rudenko:

Our proposals on the creation of National Atlas were transferred to Premier Ministers of our state. However, when we reached Premier Ministers, they changed, and our letters were lost. Then, Boris Evgenovych Paton [President of the Academy of Sciences of Ukraine] decided to send our proposal to the President of Ukraine. And, the Decree was adopted.



Many interviewees (Olexander Mazurkevych, Anatoly Stashuk) also stated that the EMDU results were used in the Rio de Janeiro report (see NATIONAL PROGRESS REPORT OF UKRAINE on Implementing Provisions of “Agenda for the 21st Century” over the Decade (1992 – 2001) <http://www.undpsust.kiev.ua>).

#### 4.4. Impact on Further International Donors’ Programs

According to the Final Report to the Canadian International Development Center (EMDU-2), the idea of “an international Dnipro” was born in the UMC in 1995. Then, they pursued it together, and now, this idea found its implementation within the *GEF Program*. The interviewees see GEF as a consequence of the EMDU program and doubt that GEF would be possible without the IDRC’s work in the region:

Through these projects, we started to realize the importance of Ukraine-Belarus-Russia collaboration. (Olexander Vasenko)

I think that it would be very unlikely that GEF would have come about as early as it did or at all if EMDU and the earlier pre-GEF projects that IDRC was involved in had not existed. I do not believe that there was enough of a body of knowledge in the GEF elite that designed this project that would have been able to do the project design intelligently enough to make a decision as whether it should be a GEF project, or not. The fact is that they had the benefit of the IDRC’s work in the region and on the basis of that, their decision was made much easier or it was convincing enough that they went ahead with the project. (Lubomyr Markevych)

GEF is a result of EMDU program. It is a fact. IDRC did not operate on international level [Russia, Ukraine, and Belarus]. Under GEF/UNDP umbrella, it became possible. IDRC pushed the program on a national level, so, it went to the international level. (Igor Iskra)

People who worked within the EMDU program, continue to work in GEF:

Many scientists continue to work, and, in fact, they have leading roles in the GEF program... So, these scientists, these bureaucrats (I call them bureaucrats in a positive sense: they were working and continue to work for the Ministry, for the Ukrainian government) will be the ones that will continue the influence on Ukrainian policy and legislation in the future. (Myron Lahola)

GEF program is a lucky one, because it gained the basis provided by the IDRC. Many of the experts of the GEF program grew within the former IDRC program. (Olexander Vasenko)

People as well as EMDU research results made the foundations for the GEF:

The results of the IDRC program were used by GEF program. (Anatoly Gritsenko)

The EMDU set the foundation to make the political and scientific community in this country more accepting of what the GEF program is all about. It was much easier to understand, and, it tied the government officials to a form of international accountability. So much of the work that the GEF has set for itself has to be done at a standard that is set by outside authorities. (Lubomir Markevych)

And, some interviewees stated the importance of GEF for the development of Russia-Ukraine-Belarus collaboration in dealing with the issues of Dnipro rehabilitation:

The program [GEF] implemented under IDRC, GEF, and UNDP financing, is difficult to overestimate. After the collapse of the USSR, every country developed separately. Program [GEF] allowed studying the experience of Western countries as well as the experience of neighboring countries. I think it allows us to find the ways of collaboration. We got closer to the European standards and adjusted our regulations and national legislation. (Alexander Apatsky)

In my view, this program is sustainable: it involves public organizations, public in general, local authorities and federal authorities. In our difficult period of changes and reconstruction, this structure assures the sustainability of the program. (Nikolai Micheev)

The EBRD loan is also considered as one of the program's achievements:

[The city of Zaporizhzhya attracted the 25 million EBRD loan.] And, our initial work in that city helped them to attract this loan. (Myron Lahola)

EMDU and Holland donors sponsored the technical economic substantiation preparation... In 1998, we finished technical economic substantiation, and in May 1999, we signed a contract. (Volodymyr Razguliaev)

While stressing the merits of the IDRC achievements in attracting foreign donors and initiating further technical assistance programs, it is necessary to state that within the interviews, a concern on such programs usefulness and Ukraine's readiness to accept them has been raised:

I do not believe that a national program of engagement today in either Russia, or Ukraine, or Belarus is worth the effort right now, because none of these three countries are seriously reformed. (Lubomyr Markevych)

From my experience, I think that Ukraine is not ready for the World Bank and EBRD loans in the forms it was done in Zaporizhzhia. As soon as credit appeared, a lot of "masters" (people who wanted to take a share) appeared as well. The EBRD rules and regulations do not correspond to the standards of Ukraine. Therefore, the problems arose. And, now, we can be accused in violations of regulations, because we followed the EBRD rules. Project is difficult and the terms of financing are difficult. And, Ukrainian legislation does not protect us. (Volodymyr Rozguliaev)

The usefulness of these programs can be considered after their implementation. And, as Lubomyr Markevych stated:

At the end of the next year, when the GEF program is finished, you have to ask yourself: "Was it worth doing this project in these three countries at this point of time?" And, what did we want to achieve and how much did we really know when we started this project, and we would have done differently. Did we have that information? Those are questions that will still be hopefully asked at the end of 2003, when this GEF project is finished. I have opinions about that, but they are still evolving as this project is still evolving. (Lubomyr Markevych)

Considering the programs of technical assistance brings us to another issue that should be raised. These programs are associated with a political risk for the people involved:

We had secret police monitoring our projects. We had secret police following us around. The old word for this is KGB. We had them coming to our offices. We had them taking equipment and documents. We had them interested in our projects. We had them harassing our people. (Myron Lahola)

There is a human risk, a political risk; EMDU experienced that in Zaporizhzhia... If you are trying to change something in the municipality of Zaporizhzhia, and it affects someone in a bad way and you cannot offer any protection, you should not encourage them. (Lubomyr Markevych)

However, one of those who was put "in danger" while implementing international projects, Volodymyr Razguliaev stated:

I agree that it is dangerous, but it is necessary to start from somewhere. It is necessary to do that anyway. It is dangerous, we had to leave, but we are different people now, we will never work the way we worked before.

## Section 5. Gender dimension

### 5.1. Country Context

Ukraine ratified the United Nations Convention on the Elimination of All Forms of Discrimination Against Women in 1980. Gender equality is reflected in the 24<sup>th</sup> issue of a Ukrainian Constitution. Ukrainian legislation presumes gender equality. However, as it frequently happens in Ukraine, reality does not reflect the legislation. Gender inequality in Ukrainian context is typically connected with (see Women's Problems in Changing Urban and Rural Ukraine):

- the decrease of women's competitiveness on the labor market: women have much fewer opportunities to find a new job: employers prefer to hire men because of stereotypes, women's involvement in household activities, and upbringing of children;
- "double burden" (work + various household activities);
- different forms of violence towards women;
- women's underrepresentation in the sphere of politics;
- and keeping them out of the decision making process.

The Soviet system managed to make Ukrainian women economically active: four-fifths of Ukrainian women have paid jobs or are actively looking for a job. Over 40% of employed women have higher or specialized secondary education (percentage for men is lower - 35%) (Dovzhenko 1998: 196). However, in a major part, this circumstance is caused by the importance of women's income in the family budget, and not by women's motivation to acquire a prominent career. Ukrainian women are forced to take any job in order to earn money and to improve their families' well being. Economic reform causes marginalization of the women's labor force:

... the special market of women's labor force is in the process of forming. It is characterized by: low wages, discontinuous employment, low qualification, limited choice of professions, poor labor conditions, horizontal professional mobility, or mobility down. (Lavrinenko 1999: 159).

A lack of motivation to acquire a prominent career and not acknowledging a problem are closely connected with the traditionalist views prevalent in Ukrainian society. Along with a legislative basis, gender equality requires realization of gender problems' existence and willingness to change the situation. And, in Ukraine, women's role is usually seen in children's upbringing and housekeeping. The sociological surveys show that such an opinion is prevalent among Ukrainian men and is shared by many women. Political leaders and even women – representatives of NGOs frequently argue that a woman's place is at home. Gender stereotypes and a traditionalist understanding of role distribution blossoms in Ukrainian mentality. Sociologists named it a "patriarchy renaissance" (see Women's Problems in Changing Urban and Rural Ukraine)

After the collapse of the Soviet Union, the number of women, members of the Supreme legislative body of the country considerably reduced (see Women's Problems in Changing Urban and Rural Ukraine). During the last decade of the USSR existence, women formed about 30% of deputies of the Supreme Council of Ukraine. And, though such a representation was a nominal one, the established quotas acknowledged the necessity of women's participation in the work of the supreme legislative body. In contemporary Ukraine, the number of women in executive and legislative bodies is insignificant.

The situation at the Ministry of Ecology and Natural Resources of Ukraine reflects the overall situation in the country: women do not occupy positions at the level of Minister, State Secretary, Deputy State Secretaries, and Department Heads. There are three women - divisions' heads.

And, the majority of Ministry's employees are women (see <http://www.menr.gov.ua>). Only one woman occupies the position of the head of the oblast's department of environmental protection and natural resources (Vinnitsa oblast), 26 are men. A similar situation was stated seven years ago within the study conducted by Lenore Rogers and Svetlana Kupryashikina (1995: p.11).

## 5.2. Women's Role in the EMDU program

The tendencies in the country were reflected in the EMDU program:

Perhaps, there was a constraint connected with the fact that women are not in the management of enterprises, ministries, and other organizations where we implemented the program. Our activities were dependent on the situation in other institutions. (Vasyl Shevchuk)

Throughout the program implementation, promoting gender sensitivity was problematic:

Ukrainian partners remain skeptical of The IDRC's efforts in promoting gender sensitivity and they do not see this as a priority issue. The near complete lack of women in senior decision-making positions is not perceived by our partners as a problem - neither do they understand the need to modify current practices. (J Guilmette 1998)

Despite the fact that women were involved in the program (at least 40% of program's participants were women), they were mostly involved as typists, laboratory analysts, and only insignificant numbers of women were involved as project managers, or UMC members:

In each project, we had women... though mostly they were just lab workers, type writers, or support staff. Unfortunately men occupied most managerial positions. (Igor Iskra)

The interviews revealed that project managers and the UMC members did not pay special attention to the issue of women's involvement. In the organizations and institutions, where women formed a substantial percent of personnel, women were involved. Correspondingly, in the institutions, where men formed the majority, women were not involved. In other words, women were either involved naturally, or not involved at all:

Women were involved naturally, because the majority of specialists in our sphere are women. The situation was different at the *Intellectual systems Geo*. There, men form the majority. We did not have women's involvement as a particular task. We have a lot of women, and, all of them, are high level professionals: doctors of sciences. More than 50 % of our participants were women. (Alla Bochkovska)

Of course, women participated in the projects at different levels. There were women responsible for the whole directions of work. These were women - doctors of sciences, candidates of sciences. There were women - professional biologists, professional chemists... There are a lot of women working at our institute..., and of course, they were involved in the projects. This was not a painful; this was a natural process. (Olexander Vasenko)

I do not understand the IDRC's policy on women's involvement. Women constitute a half of our personnel... We do not need to pay special attention to this issue... (Gennady Scherbina)

The majority of Ukrainian researchers and policy makers denied the existence of the problem. Some of the interviews revealed a lack of understanding of the requirement of women's involvement in the program imposed by the IDRC's agreement with the Government of Canada. Sometimes, the traditionalist view on women's role in society was expressed:

The problem of women's emancipation is brought to Ukrainian mentality artificially. Within many centuries, certain gender relations were formed. I like them much more than the relations that exist abroad. I do not see this problem both personally and as a specialist. I did not pay special attention to this issue. (Yury Pavlun)

The opinions on usefulness of pushing the issue of women's involvement within the program of technical assistance were different. On the one hand, pushing this issue through involving certain percent of women in the projects was considered as misleading:

These issues are imported from abroad. It is a topic that is of major interest to policy people in the West and they believe that their mission is to export that cultural condition abroad. ... If they want people in other societies to understand what the financial donors' countries are going through, then yes, you can do that. But if you are trying to change society by putting this tag on, then, I think there is very little logic to the *approach* that Western countries have used, because, it is not an approach that creates any integrity, or creates any respect within the recipient country. Too many gender programs dictate simple requirement for bare statistical equality without attempting to explain either the usefulness of promoting gender equality or monitor to see that gender equality is enhanced at all levels. (Lubomyr Markevych)

On the other hand, the very fact that women's involvement was taken into account, make people thinking about the gender issue:

The fact that women were involved at any level was already a positive shift. It shows that people understand that such criterion exists. I completely agree with this CIDA requirement. May be, we are not successful in this issue, but we started to think about it. (Iryna Trofimova)

Despite all misunderstandings and traditionalism encountered in Ukrainian mentality, the problem of gender equality was raised. The UMC and project managers were required to monitor women's involvement in the projects:

Women's participation was discussed at the UMC meetings... Women's involvement was taken into account. Jean Guilmette actively reminded the UMC members about the necessity to involve women. (Kemal Aliev)

And, some interviewees stated, this was already an achievement:

Raising the issue of women's involvement was important in a country where women's right for equal access to labor market was never discussed at a policy level, although frequently, program participants still did not pay attention to it. (Vasyl Shevchuk)

We learnt Western experience of including gender equality in program implementation. We started to understand what it is. Before, we discussed this issue at a domestic level only. Now, it becomes a part of the project. While having a CIDA requirement, we start to think about these issues and start to work out our own criteria. (Iryna Trofimova)

Thus, the issue of gender proved to be problematic in the EMDU program. The majority of the interviewees either did not acknowledge the problem, or did not recognize the necessity of women's involvement requirement imposed by the program. This can be related to the situation in the country as a whole, where women's roles are seen from a traditionalist perspective and gender inequality is not recognized at the level of a state policy. At the same time, the issue was raised, and those who participated in the program had to consider such criterion. And, some people started at least to acknowledge the problem.

## **Concluding Remarks**

Program implementation in Ukraine was challenging due to a unique character of transformations that it is going through. For decades, Ukraine was organized as a centrally planned economy guided by a one-party rule. It still remains centralized and slow in implementing economic reform associated with painful loss of social protection. Top-down management is prevailing, and people used to living in fear continue to obey the orders of higher level managers.

While working in the region, OCEEI used a strategy appreciated by Ukrainian side. Partnership was based on a mutual trust and provided the UMC an opportunity to choose the directions they considered to be important. The composition of the UMC, consisting of high rank officials and prominent scientists, made it possible to implement the IDRC research results at a policy level. Due to establishing the IDF, OCEEI managed to avoid heavy taxation on donors' assistance imposed by Ukrainian legislation.

The program was initiated at a time of severe economic crisis in the country. Scientific research was not financed, and in some cases, IDRC financing was the only one available. It allowed institutions to continue working. Due to high level requirements to research, Canadian assistance allowed not only supporting the professional level researchers had, but also improving it considerably.

The report provides evidence of the program's achievements in: data exchange facilitation, a learning experience of conducting "relevant research", the creation of a consortium between scientific and government institutions, increasing environmental awareness, and demonstrating the necessity for a public outreach component in any project that may impact people. The program initiated directions of study that were never on agendas before.

The program had a considerable impact on people who were involved in it. They got an opportunity to see the other ways of doing things. In many cases, it brought them to realization of the necessity of changes. And, some of them started to make changes.

Development of legislation was stated as one of the most considerable of the program's achievements with concern for one piece of legislation, the National Program, being more declarative and lacking institutional mechanisms for its implementation.

IDRC's program formed the basis for further international donors' technical assistance programs, particularly, GEF and EBRD loan in Zaporizhia.

The report raised several issues that might be important in view of further work in the region. Informational system projects, though implemented at a high professional level, did not always make a desirable impact on the decision making process. Interviews suggested that the major reasons for a lack of success were connected with their orientation towards particular structures (as opposed to wide public) that are under constant transformation in Ukraine, as well as software's sophisticated character, which made its support and use at the Ministry difficult.

As indicated in previous EMDU reports, changes were not achieved in gender issues. This was due to the traditionalist view prevailing in society. However, according to some interviewees, raising this issue was important as a first step towards acknowledging the problem existence.

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**Appendix. The Plasma Story. Note prepared by Ken Babcock**

This story documents how IDRC provided guidance to our Ukrainian partners which forced them to find a practical solution to a waste treatment problem. Without IDRC's intervention, the partners would have insisted upon pursuing a politically motivated choice of treatment technology, which would have been expensive and impractical for the type of waste to be treated. This would have resulted in failure of the projects objective, which was to introduce low cost improvements to waste treatment technologies in a meat packing plant.

One of the elements of the environmental audits projects of industrial enterprises was that, based on results of an audit, IDRC would sponsor the introduction of some low cost measures to reduce resource use and lessen the production of pollutants from the factories which were audited. The purpose of the audits was to identify environmental problems at the factories. Following the audits, IDRC would fund low cost activities which would lessen pollution. These included supporting changes in management, changes in processes within the plants or the installation of pollution reducing equipment. The objective was to demonstrate that with a modest expenditure it is often possible to make significant decreases in resource use (wastage) and pollution produced by an industrial plant. The intended effect would be to demonstrate to plant managers that environmental audits, followed up with the introduction of low cost pollution reducing technologies could improve the profitability of existing manufacturing enterprises.

One of the plants audited was a meat processing plant in the city of Vitutino. At the plant the environmental audit revealed that fats and other organic waste from the slaughter of animals and meat processing were overwhelming the treatment capacity of the municipal sewage treatment system, as this waste was going untreated into the sewage system. An ancillary problem was the clogging of the sewers by waste fat. The second phase of the project was for the IDRC grant to finance some low cost measures to reduce this pollution which was costing the plant in terms of sewage treatment fees and fines.

At the time that this project was underway, the Minister of Environment in Ukraine was Yuiry Kostenko, who has an advanced degree on some aspect of plasma physics. As the audit project at the Vitutino meat plant moved into the phase, that of introducing low cost pollution reduction technologies, IDRC was strongly pressured by the projects executing agency, the International Dnipro Fund (IDF), to finance the purchase of equipment for the plant which used a high energy plasma to treat waste. The equipment was being promoted by an east German company, but IDRC was not able to find any examples of its use in an industrial application. At the time, the IDRC Scientific Advisor suspected, but was unable to prove that the IDF was either promoting the use of plasma based technology because it felt that this would please the Minister, or it was responding to a directive issued by the Minister.

IDRC research indicated that plasma technology is best suited for the destruction of small quantities of highly toxic waste or the fusion of nuclear waste into a chemically inert glass. It would be poorly suited to the destruction of large quantities of low toxicity animal by product waste, due to the high cost of equipment and high energy requirements of its use. Based on this knowledge IDRC refused to fund the purchase of expensive and unproven plasma based equipment despite extreme pressure exerted by the IDF.

After several months of a stand off, in which the project stagnated because IDRC would not support plasma technologies, the IDRC project manager finally agreed to pay for a trip for the Director of the IDF, V. Navrotsky and his assistant, to visit Latvia to see the plasma equipment in use. On that trip it was learned that the technology was not proven effective for use with high-

protein waste waters. After the trip the Ukrainian project approached the waste disposal problem with an open mind and searched for a cost effect way of treating the waste. In the end, IDF recommended and IDRC supported the drilling of a well for the meat packing plant to provide adequate process and clean up water for the operation, reconstruction of a settling tank and associated fat skimming equipment and lastly the introduction of a system of introducing proprietary fat eating bacteria into the catchment basins at the plant.

IDRC's unwillingness to go along with a politically motivated, but inappropriate clean up technology forced the Ukrainian partners to find a number of low cost, yet innovative means of reducing the pollution load produced by the Vitutino meat plant on the municipal sewer system. The IDF was forced to think and act creatively rather than seeking a politically expedient yet inappropriate means upgrade the plant. In a small way IDRC encouraged independent thinking rather than a "do what the boss wants" mentality, which typified the Soviet approach to management. It is the Scientific Advisor's feeling that after the fact, V. Navrotsky, Director of the IDF, was relieved that IDRC, removed from him the burden of having to make a politically motivated decision.

## Notes

<sup>i</sup> State Secretary is an equivalent to a Deputy Minister position in Canada

<sup>ii</sup> The word "policy" does not translate in Russian or Ukrainian. Therefore, during the interviews, policy was defined either in terms of the decision making process (According to Collins Cobuild Essential Dictionary (1996:605), a *policy* is a set of ideas or plans that is used as a basis for making decisions, especially in politics, economics, or business.), or as a state policy (which is translated as a *state politics* into Russian and Ukrainian).

<sup>iii</sup> Such as, other governments, international organizations and other government levels, representatives of the civil society including users, clients and stakeholders, scientists, legislators (etc)

<sup>iv</sup> As indicated in the interview with Yury Pavlun, at present, Donetsk group got a temporary victory. This can be seen through the composition of the Cabinet of Ministers of Ukraine, Verhovna Rada, and executive bodies of Verhovna Rada as well as in fractions (people from Donetsk got major positions there). The Party "Union of Workers of Donbass" became an influential political force. Their leader is now seen as a candidate for the position of the Premier-Minister.

<sup>v</sup> Ukraine is the most environmentally degraded Republic of the former Soviet Union, with 70% of its population living in environmentally dangerous areas and 14 of its major cities declared "dead zones". There is, however, no reliable overall picture of the state of environment... The contamination of the water supply is especially serious because Ukraine has limited sources of fresh water. The average amount of fresh water per capita is only about 5% of the average levels available in the former Soviet Union. The most important source of water is the Dnipro River, which drains some 60% of the surface area of Ukraine and provides drinking water to some 70% of the population. (Executive Summary, Environmental Management Development in Ukraine, January, 1994)

<sup>vi</sup> In the countries of the former Soviet Union, post-secondary educational system presumed a University degree (from 4 to 6 years of study), post-graduate degree (candidate of sciences, 3 years of study, defense of the doctoral thesis presumed), and doctoral degree (doctor of sciences, defense of another thesis presumed). Sometimes, the U.S. and Canadian Universities consider candidate of sciences degree as a master's degree.

<sup>vii</sup> Water supply in the cities was supposed to be kept in secret because of the fear of biological war. In other words, it was presumed that if foreigners knew the system of water supply in Zaporizhia, they would use their knowledge to poison the whole city.

<sup>viii</sup> According to the manager of the project Leonid Rudenko, "specialists from Canada are very careful and knowledgeable people, they never put forward the issues of policy influence or defining the overall course of the state; Canadian side was sure, that if a person gets an information, he will have an opportunity to make decisions on economic, ecological, and social actions."

<sup>ix</sup> The overall goal of the program was to develop and deliver training to environmental entrepreneurs, and to provide collateral support for the development of the International League of Environmental Business Support in Ukraine.

<sup>x</sup> In particular, according to Kostyantyn Chebotko, vodokanals are subordinated to two institutions: to the city council executive committee and housing administrations.

<sup>xi</sup> Municipal Economy Research and Technological Institute (MERTI) "... has been involved in municipal economy studies for 40 years. 40 years ago, it was founded by the government for solving the problems of municipal economy. We conduct research in the spheres of housing, sewage, water supply, and so on. ... Two months ago, the State Committee on Municipal Economy of Ukraine was renewed. Our institute is a state organization, subordinated to this committee. And, our institute cannot be privatized, because it is considered as an institute of high priority for the country." (Gennady Scherbina)

<sup>xii</sup> REMIS-DEMIS system is working on the basis of a network (server contains the data base, and everyone works with the same data base). Interdepartmental data base software does not allow network work, and does not allow direct access to the database from the Internet. For each request, they have a picture (or, a map). If they change the database, they should change the pictures. If they ask someone else to input data, they will have non-compatible databases.

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<sup>xiii</sup> During Soviet times, apartments were not for sale, they were distributed for free by the state, this happens very rarely in Ukraine right now.

<sup>xiv</sup> Ecological centers exist both at national and oblast level. At the level of small towns, there are stations of young naturalists.

<sup>xv</sup> In December 2000, the issue of draft law on ecological audit was considered at the Board of the Ministry of Ecology and Natural Resources of Ukraine ([Hhttp://www.menr.gov.uaH](http://www.menr.gov.ua) ) In August, 2001, President of Ukraine Leonid Kuchma put the Draft Law on Ecological Audit for consideration in Verhovna Rada of Ukraine ([Hhttp://www.kuchma.gov.uaH](http://www.kuchma.gov.ua)). The draft law was on Verhovna Rada of the third convocation (9<sup>th</sup> (last) session). Within the first session of the fourth convocation, draft law on ecological audit was not on agenda (see [Hhttp://www.rada.kiev.uaH](http://www.rada.kiev.ua) ).