



IMPROVING THE EFFECTIVENESS AND EFFICIENCY OF ENVIRONMENTAL INSPECTIONS: Risk-based Prioritisation and Planning in Moldova



EAP Task Force

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This report is also available in Russian under the title:

***Повышение действенности и ресурсо-эффективности экологических проверок:
определение приоритетов и планирование на основе рисков в Молдове***

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EXECUTIVE SUMMARY

This report demonstrates an approach to increase the effectiveness and efficiency of environmental inspection by targeting polluters associated with higher risk. The pilot study it describes has adapted and tested an inspection prioritisation and planning methodology (developed earlier by the EAP Task Force Secretariat for Georgia) using the case of Chisinau City in Moldova.

Presently, environmental inspections in Moldova are not planned systematically, and the human and financial resources available to the Inspectorate are not sufficient to check all the regulated entities. The Chisinau Environmental Agency and the State Environmental Inspectorate were willing to address these problems by actively engaging in this project and rolling out its experience across the country.

The project team developed an electronic tool for the prioritisation of regulated entities based on their environmental risk and compliance behaviour and used it to conduct a risk assessment of the actual regulated community in Chisinau. The prioritisation methodology was based on each facility's total risk score and the corresponding frequency of its inspection. Environmental risks were assessed according to five criteria: sector-specific risk, sector's priority status, production process design and modernisation, quality of pollution control technologies, and sensitivity and proximity of pollution receptors. Behaviour risks included the state of self-monitoring and reporting, the operator's compliance history and environmental management practices.

The inventory of the regulated community and the risk assessment were done by the Environmental Agency staff. As a result of this work, 8% of regulated entities were classified as high-risk, 51% as medium-risk and 41% as low-risk facilities.

The Agency also evaluated the human resources requirements for compliance monitoring activities and developed a draft inspection plan for 2011. The calculations revealed an important gap between the available personnel resources and those needed to conduct inspections of facilities of different risk levels with a determined frequency: on average, Agency inspectors spend only 14% of their time conducting site visits. To bridge this gap, the Agency would need to hire additional personnel (which is unlikely given the current severe budget constraints) or seek efficiency gains in other activities performed by its inspection staff.

The following recommendations were made based on lessons learned from the pilot inspection planning process:

- Implement the system of risk-based prioritisation and planning of environmental compliance monitoring across Moldova, further refining the risk criteria and respective scores;
- Build on the electronic risk calculation tool developed within this project to create a full database of regulated entities;
- Review and revise the strategic enforcement priorities;
- Fully implement integrated, multi-media environmental inspections;
- Examine possibilities to reduce time allocation to non-regulatory tasks within environmental enforcement authorities; and

- Implement integrated environmental permitting for large, high-risk facilities and a simplified authorisation regime for the rest of the regulated community in order to both improve the effectiveness and efficiency of the permitting work and free up resources for compliance monitoring and enforcement.

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1. INTRODUCTION

1.1 Background

In countries of Eastern Europe, Caucasus and Central Asia (EECCA), inspection activities are commonly governed by laws and regulations, leaving environmental authorities with little flexibility in using their compliance monitoring powers. In some countries, the frequency of inspections is limited by law to once every year or two without regard to the environmental impact of regulated installations while in others a court warrant is required to conduct an inspection. A lot of agency resources are wasted on trivial compliance checks often influenced by local political agendas whereas serious non-compliance and pollution risks remain unaddressed. The issue of cost-effectiveness of compliance monitoring and enforcement has become even more acute in the context of repeated budget cuts for environmental authorities caused by the economic and financial crisis.

At the same time, risk-based targeting of environmental compliance monitoring activities is a major trend rapidly gaining ground in OECD and non-OECD countries over the last decade. The principal reasons for this are the following:

- The growing number and variety of statutory environmental requirements enhances the field of compliance monitoring and makes prioritisation necessary.
- The diminishing resources of environmental authorities are driving the need to “do more with less” by increasing the efficiency of compliance assurance.
- As the regulatory framework becomes more complex, there is also increasing pressure to reduce the administrative burden on the regulated community, part of which is imposed by compliance monitoring requirements.

Environmental hazard and operator performance are the two principal factors in planning inspections as well as other regulatory interventions (e.g., environment-related charges). There are several approaches to quantifying these two factors through a range of indicators.

In an effort to transfer some of these good international practices to EECCA, the OECD/EAP Task Force Secretariat¹ first addressed the issue of effective and efficient inspection planning in its “Toolkit for Building Better Environmental Inspectorates in EECCA”². The Secretariat recently provided assistance to Georgia’s State Environmental Inspectorate in improving its inspection planning procedures by using risk-based approaches. In 2008, it produced brief “Guidelines on State Environmental Inspection in Georgia” and more detailed “Guidelines on Operational Planning and Priority Setting for Inspection of Stationary Sources of Pollution in Georgia”. These guidance documents have established a methodological base for risk-based inspection targeting that is largely applicable to other EECCA countries.

¹ The Task Force for the Implementation of the Environmental Action Programme for Central and Eastern Europe (EAP Task Force) supports environmental policy reforms and institutional strengthening in EECCA countries. Its Secretariat is located at the OECD Environment Directorate in Paris. More information about Task Force activities can be found at www.oecd.org/env/eap.

² www.oecd.org/dataoecd/61/62/34499651.pdf

1.2 Purpose and Activities of the Pilot Project

This pilot demonstration project was designed to help environmental authorities in Moldova and other EECCA countries to increase the effectiveness and efficiency of compliance monitoring by targeting polluters associated with higher environmental risk and/or with history of non-compliance. It adapted, tested and fine-tuned the inspection prioritisation and planning methodology (developed earlier for Georgia) using the case of the Chisinau Environmental Agency in Moldova.

The Chisinau Environmental Agency is the largest territorial division of the State Environmental Inspectorate of Moldova. It is responsible for environmental management (including environmental impact assessment, permitting, environmental quality monitoring and compliance monitoring and enforcement) within the municipal boundaries of Moldova's capital.

The pilot case focused on the planning of inspection of stationary sources of pollution and included the following activities:

- Review of the existing legal provisions and current practice of environmental inspection planning;
- Adaptation of the risk-based inspection targeting methodology (including prioritisation criteria);
- Development and testing of an electronic tool for risk-based prioritisation of regulated entities;
- Prioritisation of the actual regulated community in Chisinau based on environmental risk and compliance behaviour;
- Assessment of human resources requirements for compliance monitoring activities;
- Development of a draft inspection plan for 2011 following the new methodology; and
- Development of country-specific recommendations to improve the effectiveness and efficiency of environmental compliance monitoring based on lessons learned from the pilot inspection planning process.

All project activities were conducted in close collaboration with the staff of the Chisinau Environmental Agency and with support from the State Environmental Inspectorate. The report was prepared at the EAP Task Force Secretariat by Eugene Mazur and reviewed by Angela Bularga, with Shukhrat Ziyaviddinov providing logistical support for the work.

The pilot study was financially supported by the government of Sweden. The report was presented and discussed at a stakeholder workshop in Chisinau on 24 November 2010. The project results were also endorsed at an annual meeting of the EECCA regional Regulatory Environmental Programme Implementation Network (REPIN) in Riga, Latvia on 8-9 November 2010.

1.3 Demand for Improved Inspection Planning in Moldova

Environmental compliance monitoring in Moldova is regulated by Government Decree No. 862 of 26 July 2004 "On Improving the System of Specialised State Control". According to this decree, competent authorities may conduct *no more than one planned site inspection of a regulated entity per year*. Unplanned inspections are possible in response to accidents, complaints or credible information pointing to a probable offence (follow-up visits are allowed to verify the implementation of corrective actions in response to a detected violation). Competent authorities are required to develop and publish their inspection plans.

Decree No. 862 stipulates that the selection of regulated entities to be inspected should be based on the degree of anticipated (in this case, environmental) damage from non-compliance with the regulatory requirements. Article 3 of the decree defines the damage criterion as a product of multiplication of a monetary estimate of damage from a violation (practically impossible to calculate for an abstract offence) and the facility-specific probability of non-compliance (based on a historic compliance record). However, in practice, given the non-applicability of this provision, the State Environmental Inspectorate is expected to control the maximum possible number of facilities in any given year. Still, the regulation provides an opportunity to define prioritisation criteria for inspection planning.

The demand for cost-efficient approaches to inspection planning is very high in Moldova: resources available to the Inspectorate, in both human and financial terms, are not sufficient for checking all the regulated entities. The Chisinau Environmental Agency (with a staff of 16 inspectors) has paper files on about one thousand facilities registered with environmental authorities (out of over 12,000 “economic agents” in the city), but no good database of the regulated community. Inspections are planned unsystematically, and their number is often inflated for reporting purposes.

Another reason why this pilot project was very timely in Moldova is that it coincides with the effort recently launched by the National Statistics Bureau to produce a nationwide registry of regulated entities for different sectors of government regulation. This effort is part of the central government’s pressure on regulatory agencies to justify their compliance monitoring strategies: a recent report by the government’s Accounting Office questioned the fact that the State Environmental Inspectorate does not inspect every facility in the country.

In order to address these challenges, the Chisinau Environmental Agency and the State Environmental Inspectorate have expressed their willingness to implement the results of this pilot project and roll out its experience across the country. This commitment was the principal reason for selecting Moldova as a case study country to demonstrate the methodology for, and benefits of, risk-based inspection targeting.

1.4 Structure of the Report

This report includes the following elements:

- Chapter 2 briefly summarises the key lessons learned from international best practices in risk-based targeting of environmental compliance monitoring and related aspects of inspection planning;
- Chapter 3 describes the methodology (and the respective electronic tool) used in this project for the prioritisation of the regulated community based on environmental risk and compliance behaviour;
- Chapter 4 explains the steps that were followed to develop an inspection plan for the Chisinau Environmental Agency, taking into account its resource constraints;
- Finally, Chapter 5 presents the project’s conclusions and recommendations for Moldova and other EECCA countries.

Annex 1 contains the details of the criteria and the scoring system incorporated into the electronic risk-based prioritisation tool.

2. KEY PRINCIPLES DERIVED FROM INTERNATIONAL BEST PRACTICES

2.1 Risk-based Targeting

Setting priorities of inspection (targeting) means that activities carried out by the environmental enforcement authority are ranked according to importance and urgency of intervention against a set of criteria. Risk-based prioritisation seeks to focus compliance assurance on business activities that are of higher risk to human health or the environment. Competent authorities aim at delivering greater environmental benefits for the same amount of compliance and enforcement effort.

Risk depends on a number of factors. It varies with the type of activity: a large complex industrial installation with high volumes of hazardous substances poses a greater risk than a simpler process handling relatively inert substances. Risk can also vary with location: an activity located next to a school might be viewed as a greater risk than one on an industrial estate. Compliance record is also important: an activity can be viewed as a greater risk if its operator has a history of not complying with environmental requirements. However, there are different approaches in OECD countries to taking account of these factors, varying in complexity and degree of formalisation.

One approach to the targeting of compliance monitoring consists of defining broad (often economic sector-based) categories of facilities based on qualitative risk-related criteria and setting minimum inspection frequencies for each category. In addition to minimum inspection frequencies, competent authorities tend to informally consider local and operator-specific risk factors to further prioritise their inspection activities. This approach is followed, for example, in France, Finland, Japan and the United States. Another, more advanced, approach consists of formal prioritisation of regulated entities with the help of a scoring system. Examples of countries using this method include the UK and the Netherlands.

To evaluate the risk of individual facilities, the inspectorate has to decide on a list of criteria corresponding to specific risk factors and the weight (score) of each criterion. Chapter 3 describes the criteria employed in this pilot project.

Adherence to some basic rules will be useful to make risk-based prioritisation effective:

- The analytical criteria need to be robust and defensible;
- The prioritisation process needs to involve all the inspectorate staff concerned;
- Corrections in priorities need to be made periodically through an iterative process that takes into account any changes in the regulatory requirements, local environmental priorities, available resources of the competent authority and lessons learned from practical implementation of the prioritisation criteria; and
- Baseline non-compliance detection data need to be established in order to evaluate the effectiveness of inspection targeting.

2.2 Frequency, Scope and Duration of Inspection

A minimum frequency of routine (planned) environmental inspections may be defined in a regulation for a particular category (sector) of regulated entities or may be set by the environmental enforcement

authority itself based on a facility's level of risk: the higher the risk, the more often the facility should be visited. A maximum inspection frequency is seldom specified in the legislation in OECD countries (contrary to the situation in EECCA), but the constraints of the competent authority's own resources limit the total number of site visits over a certain period of time. The actual inspection frequency is always adjusted to the characteristics of individual installations and inevitably depends on the professional judgement of a knowledgeable inspector.

As inspections generally seek to verify compliance with facility-specific requirements, the substantive focus of inspections (and, ultimately, the number of inspectors involved in each site visit) largely depends on how those requirements are set. In EU countries with fully integrated permitting systems (e.g. in France and Finland), all the inspections are multimedia in application of the holistic approach to pollution minimisation. Conversely, inspections in the US and Japan are medium-based only, corresponding to the regulatory programmes. However, multimedia (or at least coordinated) inspections also exist under single-medium permitting regimes. For instance, in Russia, multimedia inspections represent a majority of site visits conducted by the federal enforcement authority. This is done primarily to increase the efficiency of compliance monitoring and to lower the administrative burden on businesses.

The amount of time spent on-site should be commensurate with the level of risk, the complexity of the facility and the degree to which its environmental issues are already well known to the inspectorate. During inspections, emphasis is often placed on performing physical checks, observing how the facility is operated and maintained, making independent measurements and taking samples, and interviewing facility personnel. Records review may involve a random selection of those records that have environmental significance. Part of it, including the review of self-monitoring data supplied by operators, can be done by the inspector in his/her office before or after the site visit.

2.3 Assessment of Personnel Availability and Requirements for Inspection

The calculation of staff time is largely based on the level of total regulatory effort: in addition to compliance monitoring and non-compliance response, environmental enforcement authorities often exercise a range of other responsibilities, including permitting and ambient air quality monitoring. The regulatory effort is a function of the number of regulated entities and their relative size, complexity and associated risk.

In addition to the regulatory effort, there is a range of other activities that are not dependent upon facility risk, such as:

- Training;
- Administration (including accounting);
- Reporting, checking, and maintaining public registers; and
- Appeal and prosecution work.

The real availability of the inspectorate's staff for compliance monitoring is determined by subtracting the level of effort unrelated to inspection from the total number of staff man-hours. It should then be compared with the minimum requirements of inspection frequency, scope and duration, leading to respective management decisions.

2.4 Development of an Inspection Plan

The development and implementation of an annual inspection plan is the realisation of environmental enforcement authority's strategic priorities. The core component of such an annual plan is a detailed, time-specific description of inspection and other related activities with assigned implementation responsibilities.

The inspection plan should be based on a well defined frequency of site visits for different types or risk categories of regulated entities. It should justify the choice of facilities to be inspected in a given year by their risk rating, the date of last inspection and possibly other operator-specific factors. The duration of each inspection and staff requirements should be indicated.

The plan should also provide for and outline procedures for non-routine environmental inspections in response to complaints, accidents, incidents, etc. Finally, it should include specific provisions for plan revision over the course of the year.

3. METHODOLOGY FOR RISK-BASED PRIORITISATION OF COMPLIANCE MONITORING

3.1 Risk Criteria and Scores

The prioritisation methodology adopted by the Chisinau Environmental Agency was based on a scoring system designed to characterise the risk of each regulated facility and, consequently, the frequency of its inspection. Using the criteria and scores developed in the “Guidelines on Operational Planning and Priority Setting for Inspection of Stationary Sources of Pollution in Georgia” as a starting point, the Agency staff adapted them to the local conditions. Two groups of risk were quantified: environmental risks and behaviour risks, with scores that can be both positive (increasing the risk level) and negative (diminishing it).

Environmental risks

The assessment of environmental risks proceeds from the assumption that some technological processes have a higher level of impact than others and, therefore, require more intensive compliance monitoring. Environmental risks were assessed according to five criteria (see Annex 1 for score details):

- *Sector-specific environmental risk*: the sectoral risk scores were assigned for each of the 99 economic activity codes of the official Classification of the Types of Economic Activity in Moldova³ based on literature review and expert judgement;
- *National and local priority status of the sector*: additional points were added to the score if the sector was considered in national or local government programmes or strategic documents of the State Environmental Inspectorate;
- *Production process design and modernisation characteristics*: the scores were assigned based on the time elapsed since the last technological upgrade performed by the operator and the presence of waste minimisation and energy saving technologies;
- *Quality of pollution abatement technologies*: the scores reflected the adequacy of their design and operation; and
- *Sensitivity and proximity of pollution receptors*: this criterion was intended to characterise the potential for harm to public health and the environment. The sensitivity of receptors (their number or the particular importance attached to them) were classified as high (e.g. residential, recreational, cultural or protected natural areas), medium (individual residential or office buildings, agricultural lands, etc.) or low. The distance between them and the pollution source was also taken into account⁴.

Behaviour risks

Behaviour risks are the second group of criteria. They include:

³ Approved by the National Bureau of Statistics of Moldova on 29 December 2009, in effect as of 1 January 2010.

⁴ While it is recognised that the distances at which different receptors are affected vary depending on the specific pollutant, this criterion is considered to be suitable for the purposes of this simplified method.

- *Self-monitoring and reporting*: these criteria cover the existence of a self-monitoring programme and a sound procedure for the maintenance of pollution treatment equipment, as well as record-keeping and timely reporting to the competent authority;
- *Compliance history*: this important criterion is broken down by type of sanction (administrative fine, environmental damage compensation, temporary shut-down or criminal prosecution) imposed on the operator for every violation discovered during the previous year (five years in case of criminal sanctions), which corresponds to the seriousness of the offence; and reflects the existence of public complaints against the operator and the timeliness and effectiveness of corrective actions taken by the violator; and
- *Environmental management*: the scores cover the existence of designated environmental personnel in the business or organisation, environmental training of staff and formal certification of the environmental management system.

Categorisation of installations

After the operator's scores assigned for each criterion are summed up (as illustrated by Table 1), the total score determines the facility's level of risk (low, medium or high) and the frequency of inspections. The maximum frequency of one planned inspection per year stipulated in the Moldovan legislation (see Section 1.3) would apply to high-risk facilities, while operators in medium and low risk categories would be checked less frequently, once in two-three years and once in four-five years, respectively (see Table 2), corresponding much closer to the Environmental Agency's available resources, as further discussed in Chapter 4.

Table 1. Operator Assessment Summary

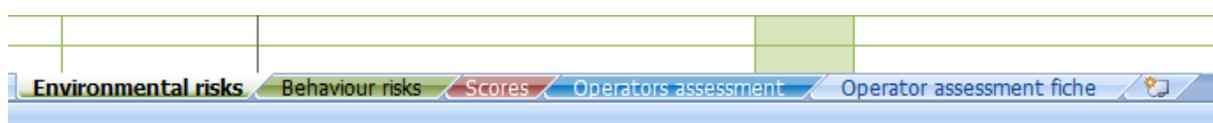
Criterion	Permitted score values	Individual score
ENVIRONMENTAL RISKS		
Sector-specific environmental risk	5 to 40	
National and local priority status	0 to 30	
Production process design and modernisation characteristics	-15 to 20	
Quality of pollution abatement technologies	-5 to 10	
Sensitivity and proximity of pollution receptors	0 to 50	
BEHAVIOUR RISKS		
Self-monitoring and reporting	0 to 30	
Compliance history	0 to unlimited	
Environmental management	-20 to 10	
TOTAL SCORE		

Table 2. Inspection Frequency in Accordance with Risk Scoring

Score	Risk	Inspection frequency
Up to 50	Low	Once in 4-5 years
From 51 to 100	Medium	Once in 2-3 years
Over 100	High	Once a year

3.2 Electronic Risk Calculation Tool

An Excel-based risk calculation tool was developed to facilitate data processing and management for the risk assessment of individual operators. It incorporates all the risk criteria and respective scores defined by the Environmental Agency and is structured as follows:



1. Two sheets (green) for data collection, which constitute the core database of primary characteristics for each operator:

Environmental risk sheet, which contains a table for reporting operators' characteristics related to five criteria: sector-specific environmental risk; priority status of the sector; production process design and modernisation; abatement technologies; and (e) sensitivity and proximity of pollution receptors.

Behaviour risk sheet, designed to collect data on self-monitoring and reporting; compliance history; and environmental management.

2. **Scores** sheet (red) contains tables with reference scores for each criterion considered in the *Environmental risk* and *Behaviour risk* sheets. These scores apply to operators' reported characteristics in order to automatically produce risk assessment results in the following sheets.
3. **Operators assessment** sheet (blue) reports computed scores for each criterion of each evaluated operator. The fields are automatically computed once data are introduced in the first two sheets.

ЭКОЛОГИЧЕСКИЕ РИСКИ					РИСКИ, СВЯЗАННЫЕ С ДЕЯТЕЛЬНОСТЬЮ			ОБЩИЙ БАЛЛ	Риск	Частота проверок
Основная классификация сектора по рискам	Дополнительные баллы, связанные с приоритетностью сектора	Организация производства и программа модернизации	Технологии борьбы с загрязнением	Уязвимость и близость объектов воздействия	Производственный экологический контроль, эксплуатация и техническое обслуживание	Уровень соблюдения требований и соблюдение требований в прошлом	Распределение обязанностей, подготовка персонала и управление			
5 – 40	0 – 30	-15 – 20	-5 – 10	0 – 50	0 – 30	от 0 до ?	-20 – 10			
IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
10	0	20	-5	10	0	0	0	35	Низкий	Один раз в 4-5 лет
10	0	20	-5	5	0	0	0	30	Низкий	Один раз в 4-5 лет
5	0	20	-5	10	0	0	0	30	Низкий	Один раз в 4-5 лет
10	0	20	-5	10	5	0	0	40	Низкий	Один раз в 4-5 лет
10	10	20	-5	20	0	0	0	55	Средний	Один раз в 2-3 года
10	0	20	10	20	20	5	0	85	Средний	Один раз в 2-3 года
10	0	-10	-5	20	5	0	0	20	Низкий	Один раз в 4-5 лет

4. **Operator assessment fiche** sheet (blue) reports computed data for any particular operator.

Паспорт оценки оператора		
SRL" Alitavira"		И.н. оператора: 85
		КЭДМ Ред.2: 31
		Район: Ботаника
Критерий	Индивидуальные условные баллы	Разрешенные значения
ЭКОЛОГИЧЕСКИЕ РИСКИ		
Основная классификация сектора по рискам	10	5 – 40
Дополнительные баллы, связанные с приоритетностью сектора	0	0 – 30
Организация производства и программа модернизации	20	-15 – 20
Технологии борьбы с загрязнением	-5	-5 – 10
Уязвимость и близость объектов воздействия	5	0 – 50
РИСКИ, СВЯЗАННЫЕ С ДЕЯТЕЛЬНОСТЬЮ		
Производственный экологический контроль, эксплуатация и техническое обслуживание	30	0 – 30
Уровень соблюдения требований и соблюдение требований в прошлом	0	от 0 до неограниченного кол-ва баллов
Распределение обязанностей, подготовка персонала и управление	0	-20 – 10
ОБЩИЙ БАЛЛ	60	
Риск	Средний	
Частота проверок	Один раз в 2-3 года	

Finally, tool users can filter the data by location (district of the city), economic activity code, individual risk criterion, overall risk level, etc. and print out the needed information.

3.3 Risk Assessment Results

The inventory of regulated entities provided the Environmental Agency with the data necessary to conduct the prioritisation. A review of paper files by inspectors responsible for each of the five districts of Chisinau revealed that there were 975 facilities that are registered at, and are subject to environmental control by, the Agency. Lead inspectors for each of the districts used the available information on the regulated entities and expert judgement to enter the assessment inputs into the database.

The risk assessment using the software described in Section 3.2 has produced the following results:

- There are 79 facilities (8%) with high risk, 497 (51%) with medium risk and 399 (41%) with low risk;
- Eight percent of the regulated entities belong to priority sectors according to the governmental programmes and strategies while 41% have local priority;
- Over three-quarters of regulated facilities (76%) operate production processes that are more than a decade old, and only less than 10% have introduced some kind of waste minimisation, energy saving or hazardous materials reduction technology in the last three years;

- Thirty-five percent of the facilities have unreliable or unutilised pollution abatement (treatment) equipment, or none at all, while only 38% have developed and implemented a maintenance programme of their pollution treatment facilities;
- More than two-thirds (69%) of regulated entities have a self-monitoring programme, of which 87% are implementing it, with 91% of the latter submitting timely reports to the Agency⁵;
- No violations had been detected in the previous year at 79% of the facilities, with only 16 facilities found in a repeated or prolonged violation (this disproportionately high compliance rate, given the figures on the age of production technologies and the use of pollution abatement equipment, is primarily explained by the fact that administrative sanctions for legal persons were only introduced and started to be recorded in Moldova in May 2009);
- Complaints had been registered against only 8% of regulated entities (which may be due to the low environmental awareness of the city's residents rather than to the good environmental performance of the facilities);
- According to the Agency staff, 69% of the facilities have personnel dedicated to environmental management, and 42% of registered operators conduct environmental training for their employees⁶; 13% have certified environmental management systems.

These results are derived from incomplete information that is available to the Environmental Agency's inspectors and should be regarded as preliminary ones. In fact, an adjustment of individual risk assessment scores based on new information is likely to lead to an increase of the share of high-risk facilities. Nevertheless, this initial tentative assessment of environmental and behaviour risks across the regulated community in Chisinau has generated enough information to perform a first round of inspection planning (as described in the following chapter) and to draw a range of conclusions and recommendations that are presented in Chapter 5.

⁵ These figures need to be treated with caution: they appear to be high and may reflect the number of facilities that have self-monitoring requirements in their permits and submit reports for the purposes of calculation of pollution charges, but may not really monitor their environmental impacts.

⁶ Again, these numbers do not seem to be credible: the existence of a staff member who has environmental matters among his/her responsibilities is not the same as having a dedicated environmental manager. The extent of environmental training may very well be minimal and not meet the criterion of "implementing a well-documented" environmental training programme.

4. OPERATIONAL PLANNING OF ENVIRONMENTAL INSPECTIONS

4.1 Assessment of Personnel Needs

Once it has been determined how many facilities belong to each category of risk (high, medium and low) and the respective inspection frequency has been established (as described in Chapter 3), a rough calculation of staff time and number needed to conduct inspections can be done via the following steps:

- a) Assessing how much time (days) is spent annually on tasks at the competent inspection authority other than regular planned inspections (such as annual and sick leave, meetings, regulatory tasks besides inspection, unplanned inspections, etc.);
- b) Calculating the average effective time each inspector has available for inspection (days per year);
- c) Estimating the compliance monitoring effort per risk category, in hours or days that need to be spent at a certain type of facility;
- d) Assessing the total time that needs to be dedicated to inspection (person-days);
- e) Dividing the total time required for inspection by one inspector's available time in order to evaluate the number of inspectors required.

Staff availability for inspection activities

The calculation of inspection staff availability at the Chisinau Environmental Agency was done based on real activity reporting data for 2009 (the numbers for the previous two years were quite similar).

First, the total number of “net” working person-days was calculated by subtracting holidays, regular and sick leave from the total work time in the year. The result was 7,343 person-days for 35 full-time staff of the Agency, or 210 work days per staff member.

A total of 16 staff participate in inspection activities in the Environmental Agency: nine work in the Inspection Division and seven are “delegated” from other divisions. Table 3 summarises the number of days spent on tasks other than *planned* inspections.

Table 3. Inspection Staff Time Allocation per Task, Chisinau Environmental Agency, 2009

Tasks	Time spent (days)
<i>Permitting and environmental impact assessment</i>	
Environmental permitting	1010
Land use permitting	228
Environmental impact assessment (EIA)	234
<i>Subtotal</i>	<i>1472</i>
<i>Compliance monitoring</i>	
Review and verification of operators' reporting	480
Planned inspections	480
Unplanned inspections (ad hoc raids, responding to complaints)	245
Preparation of protocols of environmental offences	96
<i>Subtotal</i>	<i>1301</i>
<i>Management and institutional collaboration</i>	
Reporting to State Environmental Inspectorate, Ministry of Environment, annual reporting	334
Collaboration with the Prosecutor's Office and other competent authorities	203
Participation in court hearings	16
Internal meetings	12
Staff training	10
<i>Subtotal</i>	<i>575</i>
Other tasks	12
Total	3360
Total per inspector (16 inspectors)	210

As can be seen from Table 3, permitting and EIA tasks take about 44% of the inspector's time at the Agency, compliance monitoring activities (planned and unplanned inspections, review of operators' reporting, and preparation of protocols of violations) account for 39% of the time, while management and institutional collaboration tasks take 17%. Planned inspections account for about 14% of the inspectors' time, or *30 days per inspector*.

Staff requirements for inspection activities

The level of effort and corresponding number of staff required for planned inspection activities in the Chisinau Environmental Agency were calculated based on the risk assessment of the regulated community and the related inspection frequency (see Table 2 in Section 3.1).

It was determined that high-risk facilities need to be inspected for two days by two inspectors, whereas medium-risk and low-risk facilities can be inspected during one day by one inspector. Under this assumption, all the inspections will have to be integrated (multi-media).

The calculations were performed as shown in Table 4.

Table 4. Calculation of Inspection Staff Needs

Risk category	High	Medium	Low	Σ
Number of facilities (A)	A ₁ 79	A ₂ 497	A ₃ 399	A=A ₁ +A ₂ +A ₃ 975
Normal inspection frequency (B)⁷	B ₁ 1	B ₂ 1/3	B ₃ 1/5	
Number of inspections per year (C)	C ₁ =A ₁ *B ₁ 79	C ₂ =A ₂ *B ₂ 166	C ₃ =A ₃ *B ₃ 80	C=C ₁ +C ₂ +C ₃ 325
Duration of one inspection, days (D) Including planning, preparation, travel, all actions on-site (for all the media), sampling, and reporting.	D ₁ 2	D ₂ 1	D ₃ 1	
Number of inspectors participating in the site visit (I)	I ₁ 2	I ₂ 1	I ₃ 1	
Total required level of effort (person-days, E)	E ₁ =C ₁ *D ₁ *I ₁ 316	E ₂ =C ₂ *D ₂ *I ₂ 166	E ₃ =C ₃ *D ₃ *I ₃ 80	E=E ₁ +E ₂ +E ₃ 562
Number of work days per inspector (F)				F 30
Number of inspectors needed				E/F 18.7

According to these calculations, the Chisinau Environmental Agency needs 18.7 inspectors to implement an inspection programme based on the risk assessment results and the determined inspection frequencies. However, currently the Agency has only 16 inspectors, and seven “delegated” inspectors from outside the its Inspection Division can only assist the lead inspector but cannot conduct a site visit independently. If, as mentioned in Section 3.3, the number of high-risk facilities is underestimated by the initial risk assessment due to data limitations, the gap in human resources would appear even wider. To bridge this gap, the Agency would need to hire additional personnel (which is unlikely given the current severe budget constraints) or seek efficiency gains in other activities performed by its inspection staff.

4.2 Preparation of an Annual Inspection Plan

The Environmental Agency produced an inspection plan for 2011 based on the calculations shown in Table 4. The total number of regulated entities to be inspected is 329, including all the 79 high-risk facilities, 193 medium-risk facilities and 57 low-risk facilities. Medium-risk and low-risk facilities to be inspected in 2011 were determined based on their risk score, the date of their last inspection (those entities that had not been visited for the longest time would be inspected first) and the judgement of individual inspectors responsible for respective city districts.

The inspection schedule is presented in a tabular format with the following columns:

1. Operator’s identification number;
2. Operator’s name;

⁷ For simplicity reasons, the frequencies of inspection of medium-risk and low-risk facilities were assumed to be once in three and once in five years, respectively, while they were earlier defined by the Environmental Agency to be once in 2-3 years and once in 4-5 years.

3. City district;
4. Economic activity code;
5. Total risk score;
6. Risk category (high, medium or low);
7. Inspection frequency;
8. Date of last inspection;
9. Date of planned inspection in 2011;
10. Person responsible for conducting the inspection; and
11. Note on completion of the inspection.

As shown in Table 4 (assuming the same time distribution across tasks), if high-risk facilities are visited by two inspectors over two days, it would require 19 staff. Considering the Chisinau Environmental Agency's human resource constraints, it was proposed for a transitional period to have two inspectors visit each high-risk facility for only one day. It is, however, necessary to identify short-term efficiency gains by reducing time allocation for some other lower-priority tasks to increase the time each inspector can dedicate to site visits.

5. CONCLUSIONS AND RECOMMENDATIONS

The pilot project has confirmed the need for risk-based targeting of environmental inspections in Moldova by demonstrating the lack of prioritisation in compliance monitoring, lack of inspectors, superficial nature of inspections, all of which results in the poor detection of environmental offences and inefficient use of regulatory resources.

One of the biggest obstacles to effective prioritisation of the regulated community based on environmental and behaviour risks of individual facilities is the insufficient quality of data and its poor management. Inspectors often lack objective information on operators' environmental management practices, particularly with respect to their production processes. Where the information is available, it is kept in paper files, not well systematised and difficult to access.

The implementation of inspection targeting would have to overcome the regulatory culture that is traditionally hostile to prioritisation. Moldova's Accounting Office demands universal inspection coverage, and roughly half of economic sectors are characterised as priority ones by inspectors.

It is primarily the shortage of human resources that is stimulating competent environmental authorities to seek efficiency gains in compliance monitoring. While risk-based targeting of inspections will help to improve the effectiveness and efficiency of non-compliance detection, other reforms would need to be undertaken (e.g. in environmental permitting) in order to achieve a better balance between regulatory needs and the inspectorate's available resources.

Importantly, Moldova's State Environmental Inspectorate and inspectors on the ground both recognise the problems and are eager to implement solutions to them. Since the above-mentioned challenges are quite typical for environmental enforcement authorities in EECCA countries, the following recommendations are relevant for environmental authorities not only in Moldova, but also in other EECCA countries:

- **Implement the system of risk-based prioritisation and planning** of environmental compliance monitoring in Chisinau and across Moldova, with further refinement of the risk criteria and respective scoring in accordance with the country-specific conditions and the practical experience of their use⁸;
- Build on the electronic risk calculation tool developed in the course of this pilot project to **create a full database of regulated entities** that would incorporate inspection results and enforcement data for individual facilities and allow for easier inspection planning (e.g. based on the last inspection date in addition to the risk score). For such a database to be comprehensive, a requirement should be introduced for certain categories of legal entities to notify competent environmental authorities of their establishment and going out of business;
- **Review and revise the strategic enforcement priorities** to focus on main local environmental problems and economic activities that are most responsible for these problems;

⁸ For example, there was a suggestion from the Chisinau Environmental Agency to add a criterion reflecting the full and timely payment of pollution charges by the operator.

- ***Fully implement integrated environmental inspections*** to further increase the effectiveness and efficiency of compliance monitoring, and significantly expand inspectorate staff training to enhance inspectors' capacity for multi-media compliance evaluation;
- ***Examine possibilities to reduce time allocation to non-regulatory tasks*** (e.g. by simplifying the reporting procedure and using electronic means as much as possible) to allow inspectors to devote more time to site visits already in the short term; and
- ***Design and implement a reform of the environmental permitting system*** by introducing integrated, multi-media permits (based on best available techniques) with long validity periods for large, high-risk facilities and a simplified authorisation regime for the rest of the regulated community. This reform, while challenging and demanding a transition period of several years, will dramatically improve the effectiveness and efficiency of the permitting work performed by environmental authorities and free up resources for compliance monitoring and enforcement.

BIBLIOGRAPHY

- IMPEL (2008), *Doing the Right Things II: Step-by-step Guidance Book for Planning of Environmental Inspection*, European Union Network for the Implementation and Enforcement of Environmental Law, Brussels.
- OECD (2004), *Assuring Environmental Compliance: A Toolkit for Building Better Environmental Inspectorates in Eastern Europe, Caucasus and Central Asia*, Organisation for Economic Co-operation and Development, Paris.
- OECD (2005), *Funding Environmental Compliance Assurance: Lessons Learned from International Experience*, Organisation for Economic Co-operation and Development, Paris.
- OECD (2008), *Guidelines on Operational Planning and Priority Setting for Inspection of Stationary Sources of Pollution in Georgia*, Organisation for Economic Co-operation and Development, Paris.
- OECD (2008), *Guidelines on State Environmental Inspection in Georgia*, Organisation for Economic Co-operation and Development, Paris.
- OECD (2009), *Ensuring Environmental Compliance: Trends and Good Practices*, Organisation for Economic Co-operation and Development, Paris.

ANNEX 1. ASSIGNMENT OF SCORES TO RISK CRITERIA

Sector-specific risks (examples)

Activity Sector	Score
Professional, scientific and technical services Government and social services Culture-related organisations	5
Farming Textile industry Construction industry Repair shops Wholesale and retail stores	10
Food and beverage industry Water supply and sewerage systems Printing industry Manufacturing of metal machinery and equipment Health services	20
Pulp and paper industry Non-hazardous waste management Leather industry Power and heat generation	30
Chemical and pharmaceutical industries Oil refineries Hazardous waste management	40

National and local priority status (mutually exclusive)

Criterion	Score
Priority in the governmental programmes or in the strategy of the State Environmental Inspectorate	30
Priority for the local authority or in local conditions	10
Not a priority sector	0

Production process design and modernisation characteristics (mutually exclusive⁹)

Criterion	Score
The process is more than 10 years in operation without major reconstruction	20
The process is in operation for less than 10 years or undergoes a major reconstruction based on the programme of environmental actions specified in the permit	10
The operator implemented energy saving technology within the last 3 years	-5
The operator systematically uses waste recovery and recycling within the last 3 years	-10
The operator implemented low-waste technology within the last 3 years	-10
The operator replaced hazardous substances with less hazardous ones within the last 3 years	-15

Quality of abatement technologies (mutually exclusive)

Criterion	Score
State-of-the-art abatement technologies	-5
Stack heights adequate, dispersion sufficient from discharge points	0
Poorly designed or unused abatement technologies	10

Sensitivity and proximity of pollution receptors (mutually exclusive)

Proximity to the emissions source	Sensitivity of receptors		
	High	Medium	Low
< 100M	50	20	10
100 – 250M	25	10	5
250 – 500M	15	5	0

Self-monitoring and reporting (not mutually exclusive)

Criterion	Score	
	Yes	No
Is a self-monitoring programme available?	0	10
Is the self-monitoring programme implemented, as specified in the permit, and are duly documented and up-to-date records of emissions available on-site?	0	10
Are the required reports submitted to the Agency by legally-established deadlines?	0	10
Is a maintenance programme of treatment facilities available and fully implemented?	0	5

⁹ These criteria ideally should not be mutually exclusive, but, due to a technical error, they were designed and scored this way in the database.

Compliance history

Criterion	Score
Complaints from the general public within the last year (except those that cannot be directly related to the operator's activities)	5 per complaint
Violation that resulted in a warning or an administrative fine within the last year	5 per violation
Violation that resulted in environmental damage compensation within the last year	15 per violation
Violation that resulted in temporary cessation of activity within the last year	20 per violation
Violation that resulted in criminal sanctions within the last 5 years	50 per violation
Violation that was not corrected in due time or repeated violation within the last year	30 per violation

Environmental management (not mutually exclusive)

Criterion	Score	
	Yes	No
Did the operator designate personnel or a structural unit responsible for environmental protection?	-5	5
Does the operator implement a well-documented programme for environmental training of staff?	-5	5
Did the operator obtain an environmental management certificate (ISO 14001)?	-10	0

**IMPROVING THE EFFECTIVENESS AND EFFICIENCY OF
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Risk-based Prioritisation and Planning in Moldova**

This report demonstrates an approach to improving the effectiveness and efficiency of environmental inspection by targeting polluters associated with higher risk. It describes a pilot study in Moldova which adapted and tested an inspection prioritisation and planning methodology and whose experience is largely applicable to all countries of Eastern Europe, Caucasus and Central Asia.

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