



Environmental health in Croatia – current status and perspectives

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Abbreviations:

EU	European Union
GMO	Genetically modified organisms
Ch	Chapter
OG	Official Gazette
WHO	World Health Organization
CNIPH	Croatian National Institute of Public Health
EHAPE	Environment and Health Action Plan for Europe
PCB's	Polychlorinated Biphenyls
DBF	Dibenzofuran
SCALE	Scientific, Children, Awareness, Law, Evaluation
ECHA	European Chemical Agency
EFSA	European Food Safety Agency
EEA	European Environment Agency
ECDC	European Centre for Disease Prevention and Control
NEHAP	National Environment and Health Action Plan

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Abstract

The existing environmental health system in Croatia is based on the Andrija Štampar's principles of public health and on additional changes and improvements occurred as a part of the EU accession process. However, in in-depth analysis of the environmental health situation in Croatia, it is important to evaluate not only the essential policies and transposed EU legislation, but also all other management instruments important for appropriate functions of the system. Due to the lack of appropriate horizontal collaboration of different ministries, there are »vertical« laws and bylaws generating duplication and overlapping of responsibilities, as well as the lack of the appropriate capacities for law enforcement and implementation. Existing network of County Institutes of Public Health headed by the Croatian National Institute of Public Health, as well as other institutions and organizations specifically involved in environmental and health issues should engage more intersectoral and interdisciplinary approach involving other sectors from society, as one of the main preconditions for successful implementation of National Environmental Health Action Plan. One of the priorities is to establish environment health information system, as well as to establish an independent environmental health professional association, so a sustainable inter-sectoral environmental health system could be built up. There are many other supporting programmes that may help Croatia in accomplishing this task, such as EU pre-accession programme and various bilateral programmes from different EU Member States.

INTRODUCTION

Environmental health is a branch of public health dealing with those aspects of human health and disease directly or indirectly caused by biological, chemical, physical and psychosocial environmental factors(1). Since a significant part of such environmental influence can be diminished, eliminated or prevented by appropriate environmental health measures, environmental health represents one of the main public health domains. However, the concept of environmental health has been evolving during the time, and responsibility for protecting human health from possible environmental threats is not any more in the exclusive domain of public health. Following the basic precautionary principles, the other sectors, such as the agriculture, industry, transport and environment are taking over from the public health sector the legal responsibilities for implementing the preventive measures to protect the environment and human health (2). It is particularly valid for the countries that are under the Treaties obliged to implement

the European Union *acquis communautaire* requirements in applying high-level standards for protection of environment and human health (3).

Croatia is, as a candidate country for the EU membership, in the final phase of transposing the *acquis* requirements, and in preparing its capacities for the rational and effective implementation of the high-level environmental health standards. However, in establishing an effective and rational system of environmental health in Croatia, which would achieve the high level *acquis* requirements, it is essential to rely on the available experts and institutional capacities that were developed during the last six decades. Existing legislation and policy documents on environmental health were revised in order to define the legal basis of environmental health system in Croatia. Furthermore, the current structure of the environmental health system on the county and national level was analyzed and its overview is given. According to the present situation, actions that should be undertaken in the near future are evaluated and recommended.

HISTORICAL BACKGROUND

The existing environmental health system in Croatia is based on the Andrija Štampar's principles of public health, and additional changes and improvements occurred as a part of the EU accession process. During the very first ten years after the achieved independence, small changes occurred in the public health system of Croatia, and consequently in the environmental health legislation and enforcement system. Reasons for this were partially because of the War of Independence and many other more pressing priorities, and partially due to rather good functioning of the environmental health system (4).

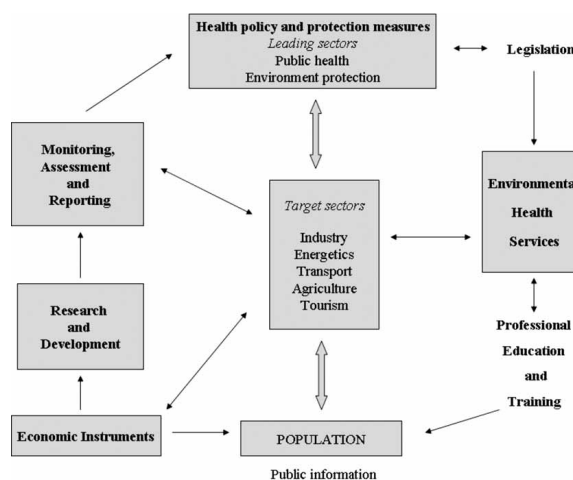
By signing the Stabilization and Association Agreement in October 2001, Croatia started to work on transposing the EU *acquis*, and during the first five years a number of radical decisions were made concerning the distribution of responsibilities for different environmental health issues among different ministries. The ministry responsible for health lost its legal competence over most of the environmental health areas, which were for decades in its portfolio, such as: chemical safety, food safety, health and safety at work, drinking and bathing water safety, air quality, hazardous waste, ionizing radiation control, etc. As it is presented by Petrović and Capak (5), the other sectors, such as the economy, environment, agriculture, etc did not have adequate capacities to be responsible for implementation of the new legal requirements, particularly if there are no new and parallel institutions established, such as for example food safety laboratories. The public health sector made a major effort to correct these mistakes, and in some of the areas success has been achieved, such as chemical safety, GMO, noise and safety of objects of common use. In some other environmental health areas, such as drinking and bathing water quality, air quality, food safety, etc, discussions continue, with the objective of finding the best possible solutions for the country, aimed towards the rational use of

the existing public health institutions, laboratories and experts. With the adoption of the first Accession Partnership with Croatia (6) in June 2006, started the negotiation process in all *acquis* chapters, including the environmental health areas covered by the five chapters. The objectives of this process are (a) to define a level of the transposed *acquis* into the Croatian legislation and (b) to negotiate time frame in which the particular requirements of EU Directives and Regulations shall be fully implemented. The implementation depends on the administrative and institutional capacities, as well as the ability of the country to apply the high level standards.

THE CURRENT STATUS OF ENVIRONMENTAL HEALTH IN CROATIA

The status of environmental health in Croatia, at least in the areas covered by the *acquis* requirements, is assessed from 2005 on the yearly basis in the context of European Commission report on ability of Croatia to assume the EU membership. The most recent Accession Partnership adopted in February 2008 (7), indicates the progress made and future priorities for assuming the obligations of EU membership in all of the 33 *acquis* Chapters (Ch), including those of particular importance for protection of environment and human health, such as the Free movement of goods (Ch-1), Food safety, veterinary and phytosanitary policy (Ch-12), Social policy and employment (Ch-19), Environment (Ch-27), and Consumer and health protection (Ch-28).

However, in in-depth analysis of the environmental health situation in Croatia, it is important to evaluate not only the essential policies and transposed EU legislation, but as well all other management instruments that are important for appropriate functions of the system. For this purpose the approach suggested in the Environment



Source: WHO Regional Office for Europe; Second Ministerial Conference on Environment and Health, Helsinki 1994.

Figure 1. Interdisciplinary and intersectoral approach to the establishment of environmental health system.

TABLE 1

The main environmental health related strategies and laws in Croatia.

<i>Main national strategies</i>
National Chemical Safety Strategy (143/2008)
Water management strategy (OG 91/2008)
Waste Management Plan of the Republic of Croatia for the period 2007 – 2015 (OG 85/2007)
<i>Main laws</i>
Chemicals Act (OG 150/2005, 53/2008)
Act on the Implementation of REACH Regulation (OG 53/2008)
Act on the Ratification of the Rotterdam Convention on the PIC Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (OG-International Treaties 4/2007)
Biocides preparations Act (OG 63/07, 35/08)
Environmental Protection Act (OG 47/07, 110/07)
Protection and Rescue Act (OG 174/2004, 79/07 and 83/2008)
Regulation on control of major industrial accident hazards SEVESO (OG 114/2008)
Air Protection Act (OG 178/2004, 60/2008):
Waters Act (OG 107/95, 150/05)
Food Act (OG 46/07)
Plant protection Act (OG 70/05)
Waste Act (OG 178/2004, 111/2006 and 60/2008)

and Health Action Plan for Europe (8) is applied and presented in the Figure 1. The current status of environmental health system in Croatia is briefly described for the following management instruments:

- Legislation and competences
- Environmental health services
- Professional profiles and education and training
- Environmental health information system
- Environmental health monitoring and risk assessment
- Public information

Legislation and the competences

During the last several years a major progress was made in transposing the environmental health acquis requirements into the Croatian legislation, and more than several hundreds of laws and bylaws were adopted by the Government and Parliament. In Table 1 there are listed only the adopted most important national strategies and laws relevant to the environmental health requirements. At the same time general acts (*lex generalis*) defined the primary and competence authorities, such as: Health Protection Act (OG 85/08), Chemicals Act (OG 150/05), Environmental Protection Act (OG 110/07), Food Act

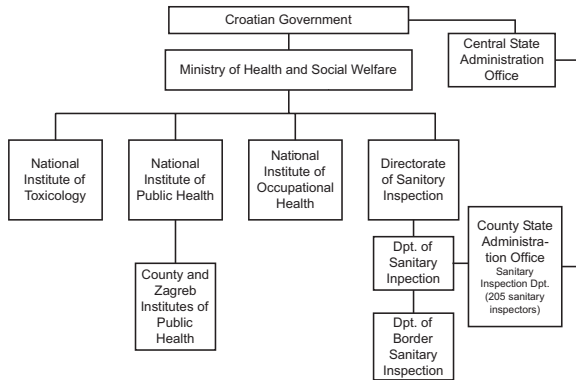
(OG 46/07), Protection and Rescue Act (OG 174/04 and 79/07).

In Table 2 there are main negotiation chapters of relevance to environmental health legal requirements, the defined competent authorities for particular negotiation chapters, as well as the responsible ministries for specific environmental health areas within the chapters. Although the negotiation process is approaching its deadline (the end of 2009), there are still some important environmental health areas that would need much better solutions for full transposition of acquis, and in particular the problems of duplication and overlapping of responsibilities, lack of the appropriate capacities for law enforcement and implementation, such as in the case of food safety, drinking water quality, recreational water quality, air quality measurements and assessment, environmental noise protection etc. In most of the cases, those are the areas where political decisions were made to transfer the responsibilities from the health sector to other sectors, without consideration of available expertise, experience, human resources and institutional capacities, including the laboratories.

TABLE 2

Environmental health in EU acquis requirements.

Chapter 1. Free movements of goods (MELE): Chemical products, Drug precursors, Detergents, Cosmetic products, Toys (MHSW, SI, PHI)
Chapter 12. Food Safety, Veterinary and Phytosanitary Policy (MAFRD): Food Safety (MHSW, SI, PHI)
Chapter 19. Social Policy and Employment (MELE): Health and safety at work (MHSW, CIOH, PHI)
Chapter 27. Environment (MEPPPC): Air Quality, Waste Management (hazardous waste), Water Quality (drinking water quality), Quality of the Sea (safety of recreational waters), Industrial Pollution control and Risk Management- SEVESO II & Chemical accidents, Chemicals REACH, GMO and Noise protection (MEPPPC, MHSW, SI, NPRD)
Chapter 28. Consumer and Health Protection (MHSW): Public health programmes (MHSW, SI, PHI)
<i>Explanation:</i> The chapter titles and sectoral competent authorities (in bold), and the respective Chapter's sub-sections and responsibilities (in parenthesis)
<i>Abbreviations:</i> MHSW – Ministry of Health and Social Welfare MEPPPC – Ministry for Environmental Protection, Physical Planning and Construction MAFRD – Ministry of Agriculture, Fisheries and Rural Development MELE – Ministry of Economy, Labour and Entrepreneurship NPRD – National Protection and Rescue Directorate SI – Sanitary Inspection PHI – Public Health Institute CIT – Croatian Institute for Toxicology CIOH – Croatian Institute for Occupational Health



Dpt. – department

Figure 2. Environmental health services in Croatia.

Environmental health services

The environmental health services, according to the WHO/EURO »can be defined as those services implementing environmental health policies through monitoring and control activities; they carry out that role by promoting the improvement of environmental parameters and by encouraging the use of environmentally friendly and healthy technologies and behavior (WHO/EURO European series No 72 1998)«. Following this definition, the environmental health services in Croatia are embracing a broad range of different inspections, professionals and laboratories. Concerning the Health sector, the overall organization of inspection and public health institutions that are acting according to the WHO definition is presented in Figure 2. Under the new Law on Sanitary Inspection, which will become effective early in 2009, the previously organized sanitary inspection system on the two levels is centralized and fully compatible with the organization of other inspections in Croatia. There are about 300 sanitary inspectors in Croatia with high professional background.

There are 21 County Public Health Institutes whose activities are being coordinated, monitored and evaluated by the Croatian National Institute of Public Health (CNIPH) as a referral institution (9). Other institutions and organizations specifically involved in environmental and health issues are the Institute of Medical Research and Occupational Health, Croatian National Institute of Toxicology, Croatian Environment Agency and a few NGOs which operate mostly locally.

The Croatian National Institute of Public Health (CNIPH) and the 21 County Institutes of Public Health, with 19 environmental health services are employing overall 448 professionals including 11 medical doctors and 146 experts with other university degrees. Analytical activities include safety analysis of food, drinking water and objects of common use (9 special and 10 basic laboratories), air quality assessments (9 institutes), waste analysis (3 institutes) and noise monitoring (2 institutes).

TABLE 3

WHO/EURO Project on Environmental health services in Europe.

CALDER, M. <i>Staffing, professional education and training in environmental health. Report on a WHO Survey.</i> Copenhagen, WHO Regional Office for Europe, 1994.
MACARTHUR, I. & BONNEFOY, X. <i>Environmental health services in Europe 1. An overview of practice in the 1990s.</i> Copenhagen, World Health Organization, 1997 (WHO Regional Publications, European Series, No. 76).
MACARTHUR, I. & BONNEFOY, X. <i>Environmental health services in Europe 2. Policy options,</i> Copenhagen, World Health Organization, 1998 (WHO Regional Publications, European Series, No. 77).
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DREW C.H., DUIVEBODEN J.&BONNEFOY, X. <i>Environmental health services in Europe 5. Guidelines for evaluation of environmental health services.</i> Copenhagen, WHO Regional Office for Europe, 2000 (WHO Regional Publications, European Series, No. 90).
FITZPATRICK, M. <i>Environmental health services in Europe 6. Development of professional associations.</i> Copenhagen, WHO Regional Office for Europe, 2002 (WHO Regional Publications, European Series, No. 94).

Drinking water quality is monitored according to the Food Act and Ordinance on Sanitary Quality of Drinking Water (10).

Other activities in environmental health services include: monitoring of physiology and human nutrition (3 institutes); monitoring and evaluation of analytical data; provision of health protection measures; field interventions in case of accidents, disasters, water contamination, outbreaks etc; policy and strategy-making; health education; international programs and projects. Moreover, there are upcoming new threats and challenges connected with terrorism, globalization of the food provision process and new contaminants, genetically modified organisms, increasing incidence of allergies; ozone layer depletion, global warming and, finally, the inability of surveillance and control services to deal with contamination with persistent organic pollutants and highly toxic chlorine pollutants such as dioxins, PCB and DBF. Unfortunately, due to the present financing model and unsatisfactory legislation, laboratory activities in great part determine and limit the research area of environmental health professionals and epidemiologists.

The Environment and Health Action Plan for Europe (EHAPE) recognized that the legislation alone, regardless how perfect it is, has little impact on the protection of environment and human health without proper organization and capacities of environmental health services. Therefore, the WHO/EURO launched in 1994, under the leadership of Xavier Bonnefoy, a major programme on the Environmental Health Services in Europe (11). The project was carried out with the major support of the UK Government, WHO European Center for Environment and Health/Bonn and Chartered Institute for Environment and Health, London, and produced the six publications on Environmental Health Services in Europe (Table 3). This WHO/EURO European Series had a major impact on development and improvement of environmental health services in Europe, particularly in the East and Central European Countries, and therefore should be used as a main guiding tool in improving the environmental health services in Croatia.

Professional profiles and education and training

The basic standards for environmental health professional profiles, and the environmental health education and training, are defined within the WHO/EURO pro-

gramme on the environmental health services (Table 3). The very first survey of professions involved in environmental health services carried out by Calder(12) resulted with a long list of 31 different categories of professionals.

Due to the ongoing War for Independence, Croatia did not participate during this period of time in this WHO programme. Therefore, Croatia is at the beginning of the process in defining the environmental health professional profiles and related model curricula. Training of environmental health professionals, particularly in respect to inspections, is currently inappropriate and organized only periodically, and when it comes to the environmental health it lacks general planning, the training manuals and/or guidelines for continued professional education.

There are substantial problems concerning proper education of medical doctors as well as other professionals in the field of environmental health. There is no adequately structured system for different levels and professional profiles in the environmental health services. One of the attempts in defining criteria and environmental health professionals profiles needed for specific functions, with the special emphasis on financing method, is shown in the Table 4.

TABLE 4.

Environmental health services network within institutes of public health and criteria for defining the professional profiles.

Financing	Contracting team with Croatian institute for health insurance		Financed programs/ national and county level	Laboratory services market
	Environmental health	Human nutrition		
Pyramid				
Croatian National Institute of Public Health	available Specialized environmental health team – specialist in epidemiology/ environmental health; – bachelor of sanitary engineering – bachelor of food technology – sanitary technician – dietetic professional Standards: 1/ 200 000 population	available Specialized environmental health team – specialist in epidemiology/ environmental health; – bachelor of sanitary engineering – bachelor of food technology – sanitary technician – dietetic professional Standards: 1/ 200 000 population	Monitoring programs – Planning and coordinating basic county programs – Implementing special national programs Food, drinking water, noise, air etc.	Referral activity – Introducing methodology and methods – Education and training – Analyses according to national programs
County Institutes of Public Health Population > 200 000	available Activities: – data gathering, analysis and evaluation; – reports on the county and national level; – interventions etc.	available Activities: – data gathering, analysis and evaluation; – reports on the county and national level; – interventions etc.	– implementation of national programs; – county monitoring programs according to the local situation	Conducting monitoring on: – national level – county level – client's demand
County Institutes of Public Health Population < 200 000	not available, but 1 team planned in the future	not available 1 team planned in the future	Current needs are satisfactorily covered by Hygiene-Epidemiology services	Basic activity Monopoly – drinking water Food: – inspection – monitoring – contracts and clients Registry on public water supply facilities

Source: Croatian National Institute of Public Health

Environmental health information system

The Croatian National Institute of Public Health is the umbrella organization for the development of environmental health information system, while the functions and competences have been defined by the Health Protection Act (9). Other relevant acts and sub-legal acts define the obligation of data collection and monitoring. In accordance with the competences arising from these acts, different registries and databases were established within some other public health institutes, such as the Croatian Institute for Toxicology, which are compatible with those established in the European Union programs. Based on the Environmental Protection Act (13) the Environmental Protection Agency (AZO) is the umbrella institution in Croatia for the development of the Environmental Protection Information System (ISZO). In this way preconditions are created for systematic development of compatible environmental health information system within the field of environmental health.

Although environmental health information system in Croatia is in the process of being established, its development is following the principles and criteria of the WHO/EHIS programme as a part the EU European Environment and Health Action Plan. Croatia as a candidate country for the EU should make a major progress in preparing for full participation in this EU programme. Concerning policy and strategy documents, the European Strategy (SCALE) and respective Action Plan, as well as WHO directives, should be followed (14, 15).

Environmental health monitoring and risk assessment

An important part of the EU Acquis requirements is the regular reporting on the environmental health situation within the territory of single European market. These requirements are in most of the EU Directives clearly defined as a reporting obligation of the national authorities to be submitted at least annually to the Commission, and in the case of Regulations to be submitted to the different EU Agencies. These EU Agencies are replacing the national authorities in the case of EU Regulations (supra-national legislation), and the following are of special importance for the environmental health issues, such as the European Chemical Agency – ECHA, the European Food Safety Agency – EFSA, the European Environment Agency – EEA and the European Centre for Disease Prevention and Control – ECDC. Within their legal competences, the agencies are put directly before the national competent authorities for implementation of special provisions from regulations applicable on the whole territory of the European Union. The European food Inspection was also founded as the supranational inspection which controls the work of national food inspections. The monitoring and reporting is the system for controlling the situation on the territory of European Union. Therefore, Croatia should make special effort to build up the environmental health monitoring and reporting system in line with the EU requirements. Based

on the data obtained through environmental monitoring, the environmental health system should enable studying and identifying the connections between environmental data and population health status. Such gained knowledge and understanding allows problem prioritization and timely development of public health programs. Health impact assessment should be one of the key principles in the process of decision-making in physical planning and the construction of industrial, infrastructural and other facilities. It is absolutely necessary to integrate environmental health in the processes of strategic environmental and health assessment. In order to achieve that, the legislation and environmental impact assessment system should first be modified.

Public information

One of the main tasks of the environmental health services is to provide appropriate information and education of the population, and to ensure a timely and accurate notification on possible health hazards, generate correct risk perception, as well as to provide public cooperation and understanding when introducing particular environment and health protection measures. Adequate collaboration and partnership with the media is of prime importance when informing and educating the general public. All sensational and apocalyptic approaches to informing should be avoided by all means, as they create panic and public misperception of certain risks, as well as unnecessary and unuseful tension.

The accidents and crises which happened during 2007 (Karlovac, Sisak, Vrbanj) clearly pointed to the absence of appropriate crisis-solving plans, an insufficiently defined responsibility of governmental sectors for particular environmental health problems (some sectors took over authorities, but not responsibilities over the consequences on human health), inconsistency between sanitary services and state governing bodies, as well as to a poorly defined role of institutes of public health and its laboratories in the crisis-management process. Furthermore, when creating an environmental health network, as well as establishing legislation, the early alert and rapid response system and its capacity for managing critical situations related to environmental accidents should be taken into account (similar to the rapid alert system for infectious disease outbreaks).

CONCLUSIONS – THE FUTURE PERSPECTIVES

Croatia made a major progress in transposing and implementing most of the acquis requirements in order to assume the EU membership in 2010. However, there is lot of work and effort needed to upgrade the environmental health services and other management instruments in order to be in position to implement the high-level standards under the acquis requirements. The National Health Development Strategy for the period 2006-2011, which was adopted in the Croatian parliament, clearly recognized the above identified problems, and

paid special attention to the role of the public health institutions as a backbone for the successful implementation of the statutory *acquis* requirements and the Parliament defined that the first measure to be implemented (by 1 January 2008) is »to develop the strategy for the new public health system that should serve as the basis for the implementation of extensive reform interventions, and especially in the planning of those key activities upon which depends the harmonization with the EU regulation and practice. Moreover, it is also necessary to create a detailed action plan of reform, as well as establish and adequate institutional infrastructure that shall ensure the efficient implementation of reform.«

Croatia did not implement this measure, but in the meantime it developed the National Chemical Safety Strategy (16). This Strategy was developed based on the initiative of the European Commission, recognizing that due to the lack of appropriate horizontal collaboration of different ministries, the prepared »vertical« laws and by-laws by each of the ministry, created major overlapping and duplication of responsibilities in respect to the subjects, measures, basic competences and in different inspections functions and responsibilities. Following the successful work of national chemical safety Committee nominated by each of the ministry, the Strategy was adopted by the overwhelming support by the Croatian Parliament (adopted with 105 »for« and 0 »against« votes). However, in spite of the success, there was no follow up continuation of the inter-sectoral collaboration of the Government Committee, although it was the most important decision of the strategy and the parliament.

Therefore, it should be a lesson in preparing for the Environmental health strategy and the action plan. The inter-sectoral cooperation is the main precondition for the success of the National Environmental Health Action Plans, especially because small countries like Croatia, are not able to afford high professional levels and expert institutions (regardless whether in the public or private sector) in order to fulfill all of the obligations under the EU *acquis* requirements. The NEHAP is just an instrument to assist the competent body to find the most rational and effective environmental health system based on the inter-sectoral approach.

Additional important measure to build up a sustainable inter-sectoral environmental health system is establishment of the environmental health professional association. This professional association should be totally independent from the political and any other interests, and should be based only on the expert and professional merit. It should have similar role and function as some other much older and traditional associations of particular professions, for example like the national medical chamber. The role of environmental health professionals and their associations in developing the sustainable environmental health system was recognized by the Second ministerial conference on Environment and Health in Europe (Helsinki 1994). As it has been already described earlier, the WHO/EURO created the programme on Environmental Health Services in Europe, and the last

publication (No 6) provides the guidelines to the countries how to create the environmental health professional association, in close collaboration and assistance with other European and Global associations.

Finally, there are many other supporting programmes that may help Croatia to upgrade the environmental health system. First and foremost is the EU pre-accession programme, providing not only the expertise, but also the necessary funds for all those areas where Croatia needs to upgrade its capacities for implementing the *acquis* requirements. In addition to these funding sources, there are also a number of bilateral programmes, provided for the same purpose by the EU Member States (SIDA, DANIDA, NORADA, MATRA, etc). If Croatia wants to prepare the Environmental and Health Performance Review of the Country, there is also a funding available from the European Commission/DG SANCO, including the expert support by the WHO/EURO. This project should be seen as a very first step in preparing the assessment of environmental health situation, as a basis for development of NEHAP. However, what is missing in Croatia at this moment is a genuine wish to start and apply for the international assistance, and be involved with the colleagues in other European countries in creating the unified European environmental health community.

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