

NATIONAL RESEARCH AND DEVELOPMENT INSTITUTE FOR SOIL SCIENCES AGROCHEMISTRY AND ENVIRONMENT – ICPA BUCHAREST

National Research and Development Institute for Soil Sciences Agrochemistry and Environment – ICPA encourage and foster fundamental and applied research of public and national interest, as well as technological developments, relating to:

- the characterisation and quantification of natural resources and the environment - with a high priority given to the deeper understanding and better prediction of different processes relating to soil formation and functioning in natural and man-made ecosystems;
- plant nutrition and soil fertilization - with a high priority given to the development of nutrient management practices capable of sustaining market-oriented crop production with low environmental impact;
- sustainable soil and land management – with a high priority given to the consequences of soil pollution and the rehabilitation and ecological reconstruction of lands affected by pollution;
- the management of agricultural, urban and industrial wastes – with a high priority given to a) the establishment of technologies to use sewage sludge on agricultural land and b) research on the impact of spreading sewage sludge, on agricultural land, including the influence on crop yield and quality, soil, water and air;
- the complex processes and problems associated with the management of agro-ecosystems and rural development.

Research and development activities are undertaken primarily in accordance with the priorities established by a) the scientific and technological objectives of the National Research, Development and Innovation Programme of the Ministry of Education including the nucleus programme, and b) the sectoral plans, and specific research needs of other Ministries.

Monitoring and Evaluation of Natural Resources

In 2005, the common inter-ministerial Order No.242/197/3005 issued by Ministry of Environment and Water Management and Ministry of Agriculture Forestry and Rural Development (published in the Official Gazette No.471/03.06.2005) approved the organization of the National Integrated Soil monitoring System for surveillance, control and decisions to reduce the input of pollutants coming from the agricultural sources and the management of organic wastes coming from the animal husbandry farms in areas vulnerable and potentially vulnerable to pollution due to the nitrates, by which ICPA was appointed as a Reference Institution to manage this system. Therefore, in collaboration with the local/regional Soil Testing Laboratories owned by the Ministry of Agriculture and Rural Development, ICPA currently has responsibility for undertaking and managing all soil classification and survey work in Romania together with the on-going monitoring of soil quality, maintenance of soil-related thematic maps (e.g. erosion and salinity), definition of land use capability etc.

Combined with other research, technical services and policy support activities relating to soil and water, ICPA therefore now effectively operates as the ‘Soil Focal Point’ for supporting implementation of the EU Nitrate Directive and other soil and water legislation in Romania. The Institute strengthened this position by:

- Establishing the National Reference Laboratory for Soil, Crop and Waste Analysis – This laboratory will specifically support implementation of the EU Sewage Sludge Directive 86/278/EEC which requires the development and provision of certified reference materials and proficiency testing schemes. In the longer-term it will also be used for the validation and quality control of other harmonized analytical methods relating to EU legislation e.g. for the monitoring of priority chemical substances under the Water Framework Directive 2000/60/EC;
- Enhancing the country level soil monitoring system by improving its coverage and performance so that it can now fully and effectively be linked with the new pan-European Soil Monitoring Network;
- Data collection for the environment and land management (EAFRD Priority Axis 2) indicators that are used to evaluate future EU co-financed rural development programs.

Soil data and information are relevant for a number of policy areas: agriculture, food safety, environment protection (soil, surface and ground waters), nature protection, biodiversity, development policy. The same for the importance of soil data for global multilateral agreements ratified by Romania (UNFCCC - United Nation Framework for Climate Change Convention, CBD- Convention on Biological Diversity, UNCCD – United Nation Convention to Combat Desertification).

The EU Thematic Strategy for Soil Protection addresses these different policy areas in a coherent manner and proposes the way forward towards effective soil protection in Europe. In the Common Agriculture Policy (CAP) Rural Development is playing an increasingly important role in helping rural areas to meet economic, social and environment challenges of the 21st century. Agriculture is a key determinant in the quality of the countryside and environment. The strategic objective related to soil data and information system is the enforcement of ICPA as a National Soil Data Centre as a single focal point for soil data and information for the national public authorities and institutions, private bodies and for citizens.

Provision of Analytical and Other Technical Services, including Support for Policy Development

ICPA provided a range of high quality analytical and technical services to its private sector and governmental customers, including objective and independent support to policy-makers and innovative consultancy to private businesses.

In order to support the development of the analytical facilities and services offered, ICPA used time and resources in the accreditation of the laboratory for testing and quality control of fertilizers (according to the rigorous ISO Standard 17025) in accordance with EC Regulation No. 2003/2003 that specifies the composition, labeling, traceability, safeguards and packaging of EC fertilizers.

ICPA have designated the nitrate vulnerable zones (NVZ) and prepared the guidelines for developing the Action Program for each territorial unit included in NVZs in support to the implementation of Nitrate Directive (World Bank project).

ICPA have evaluated at the request of Ministry of Agriculture and Rural Development the potential to cultivation of crops for bio-fuels and bio-liquids production according with EU Regulation 209/28/CE, and prepared the country case study for biophysical indicators used

for defining less favoured areas for agriculture according with the recommendations of DG-Agriculture.

Development and Maintenance of Information Systems for Sustainable Soil and Water Management

The sustainable management of soil and water resources by farmers and other major land users is “information intensive”. It is essential for farmers, advisers, scientists and policy-makers to know as much as possible about the characteristics of soil resources, the factors limiting their productivity and measures needed to manage these factors.

ICPA was therefore committed to making the best use of information technology in soil science, agro-chemistry and environmental protection in order to:

- enlarge and improve its existing databases on soil and land-based resources;
- develop the use of geographic information systems (GIS) and remote sensing for sustainable management of soil/land resources and environment in the Romanian context;
- elaborate and apply of models to simulate soil processes, crop production systems etc.
- develop computer-based decision support systems for sustainable management of crop production systems e.g. optimum fertilizer application, diagnosis of plant nutrient deficiencies, calculation of nutrient balances etc.

Knowledge and Technology Transfer

ICPA created knowledge and understanding of the impact of human activity upon the environment, together with the necessary information and technology for making more sustainable use of natural resources.

The Institute had responsibility to effectively transfer this know-how to the wider community and therefore:

- encouraged public understanding of soil and environment by dissemination of information on the environmental impact of human activities via web-sites, brochures, press releases, popular scientific publications, etc.;
- developed appropriate links with the existing network of extension service providers giving information and instruction for location-specific adaptation and adoption of relevant research findings;
- prepared decision support systems for clients and decision-makers at local and national level;
- provided technical assistance for training courses for farmers and specialists of public institutions responsible for implementation of agro-environmental regulations, including the elaboration of handbooks on agriculture practices for sustainable soil and water management (e.g. Courses organized for farmers and specialists from public institutions involved in application of Nitrate Directive under the umbrella of the “Integrated Fertilizer Control” project financed by the World Bank through the Ministry for Environment and Climate Changes)
- organized courses for farmers related to recommendations for sewage sludge application on land
- organized courses for farmers related to the best practices for mineral fertilizing and levee fertilization

- co-organized conferences and congresses: Romanian Soil Science Society Conferences (at every 3 years). World Congress of the CIEC (International Organization for Chemical Fertilizers) in Bucharest 2010.

Infrastructure development

ICPA has developed its infrastructure for research and development mainly using the World Bank financed MAKIS project „Modernizing agricultural knowledge and information system (MAKIS) - Institutional Reform Program for ICPA”. Additional equipment have been purchased on research and development projects financed by the National Research, Development and Innovation Programme of the Ministry of Education.

Main projects in the last years

Risk Assessment Methodologies for Soil Threats in Europe – RAMSOIL (Contract 044240, 2007-2010, FP6)

Assessment and strategic development of INSPIRE compliant Geodata-Services for European Soil Data – GS Soil (ECP-2008-GEO-318004, 2009-2012)

Mitigation Drought in Vulnerable Area of the Mures Basin – MIDMURES (Contract 07.0316/2010/52303/SUB/D1 at request of European Parliament, 2011-2012)

Integrated system for protect and analyse the status and trends of water threatened by nitrogen pollution” – CLEANWATER (LIFE09 ENV/RO/000612, 2011-2014)

Consultancy Services for Developing the Code for Good Agriculture Practices for Water Protection Against Nitrate Pollution from Agriculture Sources (World Bank Financed project through Management Authority “Integrated Pollution Control in Agriculture” of the Ministry of Environment and Climate Changes, 2012-2013)