From Nature Conservation to Sustainable Development

Eugene V. Krasnov

Abstract

This paper presents the author's vision about some essential results of many years international cooperation in the environmental sciences and practice development in the Baltic countries and regions, including Kaliningrad District of Russian Federation. First interest would be given to a long-term and very successful International cooperative projects, integrated in "The Baltic University Programme" (BUP), which was coordinated by Uppsala University, Sweden. Short description of some important series of courses, which was formed by participants, would be presented. For Would Climate Research Programme was organized project "Baltic Sea Experiment" with our participations and presentation of papers about climate change in Kaliningrad District and their consequences for agriculture. The study also pays special attention to annual German–Russian Days in Kaliningrad with connection to international programme "Man and Biosphere" and development of biosphere reserves between Russia, Lithuania, and Poland. Finally, author suggest some tasks for students about modernization traditional curriculum schemes.

Keywords

Baltic University Programme · Environmental science · Sustainable region · Protected areas spatial zoning

E. V. Krasnov (✉)
Department of Geography, Environmental Management and Spatial Development, Immanuel Kant Baltic Federal University, Kaliningrad, Russia
e-mail: ecogeography@rambler.ru

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Introduction

This is a brief overview of the ideas, approaches and results in the field of environmental research and education, that were achieved by the participants of the multi-year forum called "The Baltic University Programme" and some others. It is intended primarily for students, interested in methodological aspects of the development of educational technologies in close connection with research in the field of regional development. To this end, the author offers readers the task of self-comparative study and content-analysis of the main standard courses and peer-reviewed publications on the most actual ecological problems of the Baltic region and many others.

These two counter-flows of information should be compared not only as verbal models, but also in a meaningful sense, in view of the interdisciplinary approach, that brought together University professors and researchers from the Baltic region in search of better understanding and cooperation. The main purpose of this unusual task, presented in the title of the article, is to up the activity of students in relation to their choice of the most preferred cluster of formal disciplines and conscious direction of research bringing us all closer to a more sustainable development.

The Baltic University as an International Cooperative Programme

Really, this is a unique educational programme aiming at sustainable development which was generated in 1991 and realized until today by intercultural communication between students and researchers networks of 232 national universities (Ryden et al. 2003).

The Environmental Sciences courses as multidisciplinary overviews of the geosituation in the Baltic Sea region (see also Krasnov et al. 2013; Barinova and Kokhanovskaya 2015; Koroleva and Revunkov 2017; Koroleva et al. 2019) and on how to manage and protect it. The courses for undergraduate level provide an excellent background for studying the courses on sustainable development. The course can be divided into two equivalent modules:

The Baltic Sea Environment
Basic Environmental Science

which can be studied separately (Lindroos 2013).

The Baltic Sea Region Area Studies

The courses treat the region and its societies under eight headings: history, culture, language, democracy, multiculturality, social conditions, economics and security in connection with climate change. The courses deal mostly with the

conditions in the region after the systems change in 1989–91. Regional development is in focus with emphasis on legal base and economics (Krasnov 1993, 1994; Kropinova 2009; Krasnov et al. 2014; Krasnov and Kropinova 2017).

Peoples of the Baltic
Regional development

The course on Sustainable Baltic Region deals with sustainable use and management of natural resources and long-term protection of the environment (Zaporozhsky and Krasnov 1996). Important issues in the course are energy and energy use, material flows, economy and ethics, industry, agriculture, transport and community development.

One very original course on "Sustainability Applied in International learning Sail", which was organized by the Baltic University Programme consists of workshops, seminars and group discussions on board a sailing ship "Fryderyk Chopin" (17–24 May 2013) from Gdynia, Poland to Visby, Sweden, and finished next in Gdynia. Participating teachers represents different universities from 12 countries. The course was focused on sustainability issues in the Baltic Sea Regions, with the aim to give a more widened understanding of the problems and possibilities for more sustainable development in the whole regions of Earth. Starting point was related with the competences and experiences within the group activity, contribution our own knowledge and expertise and acted as workshop leaders and lecturers, participated in discussions and presented posters on different themes, updates knowledge and broadened their views. All "sailers" participated actively and they were working with the topics and presentations.

The Sustainable Water Management courses are master's level and focusing on sustainable use of water and water resources in the Baltic Sea region. Students should preferably have a background in e.g., hydrology, geology, physical geography, agronomy, soil science, forestry or environmental engineering (Jankauskas et al. 2004). The full course consists of three modules, which can be studied separately:

The Baltic Waterscape
Water Use & Management
River Basin Management

This course can also be studied as Internet course at Uppsala University.

The Community Development courses are master's level courses focusing on sustainable community development and urban planning (Barinova et al. 2019) with an emphasis on the Baltic Sea region. The courses are interdisciplinary, problem oriented and preparatory for a professional career. The course includes three separately modules:

The City
Building Sustainable Communities

Urban Sustainability Management

The Environmental Management Systems and Certification courses address management in all kinds of organizations, although industries are in focus. They are well adapted for competence development of professionals. The course consists of four modules:

Policy Instruments for Environmental Management
Cleaner Production and Technologies
Product Design & Life Cycle Assessment

Text-book in a series on Environmental Management also was published (Weiß and Bentlage Weiß and Bentlage 2006).

Ecosystem Health and Sustainable Agriculture

This is new educational courses from Baltic University Programme, which was realized in cooperation with Envirovet Baltic programme (2008–2011) to transfer our knowledge on sustainable land use, rural development, and management to teachers, students and professional not only in the Baltic Sea Regions, but also in the Great lake Regions of USA and Canada, because participated in this projects several experts from American universities. The courses address the field of rural development, sustainable agriculture and animal health pertaining to the Baltic Sea Region and to some degree also the Great Lakes region as comparison with USA experience (Jakobsson 2012; Beasley and Adkesson 2012; Karlsson and Ryden 2012).

The marine and coastal terrestrial zones of Earth in different regions its affected by many different toxic pollution from agriculture and waste—water treatment plants, as well as discharge from industries, and waste facilities leads to eutrophication, for instance, in Curonian and Vistula Lagoons, and Baltic Sea too (Wulf et al. 2007; Barinova et al. 2012). In this case was important to increase our knowledge of and improve the management of land and water basins to prevent pollution from agriculture and related activities in rural and urban areas. It is also of great significance health conception to understand and prevent environmental problems for the future.

This example of cooperation it represents a possibility to combined efforts and positive effects of convergence knowledge from agronomists, veterinariens, nature and social geographers, biologist, chemists, economists, business and policy experts (Fedorov and Krasnov 2012; Barinova et al. 2015; Gaeva et al. 2019). It also represents a new way on sustainable agriculture and its parts in the rural ecosystems. There will also be new substantial knowledge on such subjects as land use and rural development, climate change, ecosystem health and the interaction between the wild and domestic animal population, as well as public health components and poverty alleviation (Beasley and Adkesson 2012).

The course package is consist of three modules:

Sustainable Agriculture
Ecology and Animal Health
Rural Development and Land Use

The first are more basic level information, it can be used for students studying at most faculties and could also be attractive for administrators from ministries, government offices or municipalities, advisors and managers. The second and third modules their suggesting for studying more profound agronomy, veterinary, public health, geography, biology, wildlife management or similar subjects. Three books of course package was published in 2012.

In accordance with accepted by participants of these Project the Baltic 21 definition of Sustainable Agriculture contributes significantly to the society of the future. Sustainable agriculture is the production of high quality food and other agricultural products/services in the long run with consideration taken ti economy and social structure, in such a way that the resource base of non-renewable and renewable resources is maintained. Educational materials its available to all universities, in the drainage basin of the Baltic Sea. This project is so for financed by SIDA and the Swedish Institute.

Crisis Management Challenges in Kaliningrad

This Project (2008–2014) was supported by International Association for the Promotion of Cooperation with scientists from the Independent states of the former Soviet Union (INTAS) of years (2008–2014) of cooperation and finished by monograph publication (Krasnov et al. 2014). In this book, five crisis case studies are analysed of events that occurred after the collapse of the Soviet Union.

At 13 May 2015 in Uppsala University in connection with participation in the International Conference on "Teachers Competence Development Training in Education in Sustainable Development: steps to a Sustainable Future" the last certificate was given to me.

This conference included some invited lectures, for instance prominent American futurologist Dennis L. Meadows with new presentation "The Myth of Technology and Sustainable Development", which was very pessimistic about technological solution of all global problems (demographic, poverty, environmental, etc.).

But other presented topics from Baltic countries was more positive and focused to:

- Experimental Education for Sustainable Development
- Teaching for Quality Learning at University
- Alternative teaching methods
- Education Sustainable Development as integral part of teaching.

German-Russian Initiatives

From 2016 was started new German-Russian initiative on joint study "Climate Change and risks for Environmental Security" by experts from Martin-Luther University in Halle-Wittenberg (Germany) and Immanuel Kant Baltic Federal University in Kaliningrad (Russia). The first seminar was focused to regional aspeds of climate change and needs analysis for agriculture security. The problem of alternative sources of energy for local needs also was discussed. Participants of new initiative presents some cases on civil activity instruments for climate defence. By Dr. Dara Gaeva was suggested idea on Internet—platform "Climate Change—Adaptation to these phenomenon in Kaliningrad" organization, which was supported by all participants (Krasnov et al. 2013).

This platform urgently need for local people in the context of very fast and dangerous storms, floods and other negative consequences of modern climate changes, which generate by Atlantic centers of cyclonic dynamics more and more frequently in the last decades. This initiative it open for free discussion, interview, expert estimations, new data and results of study publications etc., all thinks on region and climate generated transformation of soil and waters quality, transport communications situations and so one.

Proposals for Possible Future Cooperation in the South Baltic Region

In accordance with previous experience I would like to suggest for discussion a new typology of South Baltic protected coastal areas development (see Table 1).

To Common Data Base

Hydrometeorological stations, sanitary-hygienic inspectors, the forestry and fishing service and the water utilization boards are responsible for monitoring of various components of the environment in the Baltic Sea region. Observations of air, soil, plants and surface and groundwater quality have regularly been carried out for 20–25 years (Ryden et al. 2003). Furthermore, birds—their numbers and migration patterns—and some mammals are being studied. Shore erosion, as well as other coastal processes, are controlled annually in the Baltic coastal zone. Concentrations of metals, hydrocarbons and other chemical substances, as well as radioactivity, are being measured. Water monitoring was carried out in the by, inter alia, the Lithuanian Hydrometeorological Laboratory in Klaipeda and Russian Atlantic Scientific Research Institute of Marine Fisheries and Oceanography (AtlantNIRO). Altogether, 30 permanent monitoring stations have been in operation in the lagoon areas.

Table 1 Typology of South Baltic protected coastal areas (from Krasnov 1993, with essential remarks)

Name of area	Category	Aim of protection	Country
Terrestrial area Curonian Spit	National park (Russian part)	Conservation of dunes ecosystem, recreation, scientific, research, education	Russia (Kaliningrad) Lithuania
Vistula Spit	Landscape park (Russian part)	Conservation of dunes ecosystem, recreation, scientific, research, education	Russia (Kaliningrad) Poland
Estuarian area Curonian Lagoon	Fish reserve	Aquaculture, fisheries, recreation	Russia (Kaliningrad) Lithuania
Vistula Lagoon	Fish reserve	Aquaculture, fisheries, recreation	Russia (Kaliningrad) Poland
Marine area Curonian slope	Marine park	Exploration Marine park	Russia (Kaliningrad) Lithuania
Vistula slope	Marine park	Exploration Marine park	Russia (Kaliningrad) Poland

An exchange of data between this centre and similar institutions in other countries around the Baltic would be most valuable and, eventually, a common data base for the southeastern Baltic Sea could possibly be established. In the Baltic regions there is, however, an urgent need for up-to-date measuring equipment and sensors for field observations, and equally modern instruments and trained personnel for analyzing data collected at our analytical laboratories. Self-evidently, international intercalibration of methods and practices is also necessary, to develop in accordance with HELCOM declaration (Kropinova 2009; Krasnov and Kropinova 2017).

Conclusion

Despite the long-term efforts of the Baltic University Programme participants environmental education and research of actual human problems in many respects keep ineffective traditions (standard lecturing, preparation of multi-volume manuals, series of seminars and practical classes). The early proposed solutions for the modernization of these processes are often local. A fundamentally different approach is opened by real interdisciplinary "cross-cutting" methods of research and development, which were initiated by Russian scientists V. V. Dokuchaev, V. I. Vernadsky and their western followers (L. Margulis, D. Sagan, J. Lovelock

et al.). Students' conscious choice of appropriate training modules and areas of research will help them to achieve the desired results faster, than using previous formal procedures only.

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