Dear Reader,

EcoRegion is an important project that supports the realisation of sustainable development approaches in the whole Baltic Sea Region and contributes to making it a sustainable and prosperous place.

In recent years, progress has been made to advance sustainable development in the Baltic Sea Region. These efforts are now supported by the EcoRegion project, which seeks to turn this area into the world’s first EcoRegion, where economical growth goes hand in hand with environmental integrity and social justice.

The project is based on the unique multi-stakeholder network of Baltic 21, which was created for the realisation of the Agenda 21 for the Baltic Sea Region. By way of eight sectoral platforms, Baltic 21 members carry out joint actions and cross-sectoral activities to pursue Sustainable Development in the Baltic Sea Region and the implementation of the Council of the Baltic Sea States Strategy on Sustainable Development 2010–2015. Furthermore the project is aligned with the Aalborg Commitments, through which regional governments voluntarily commit to defining clear targets and implementing concrete actions for Sustainable Development.

Through the EcoRegion project, ten model regions prepare strategic sustainability plans and implement a selected set of concrete measures designed to reach these Sustainable Development targets. This process is supported by a capacity building programme on Integrated Sustainability Management Systems. Numerous workshops foster the inter-regional, cross-sectoral and sectoral-regional dialogue and understanding on Sustainable Development within the Baltic Sea Region. In addition, public materials, including a good practices database, provide information on how to foster Sustainable Development on a regional level.

One of the publications produced by the project is the series EcoRegion Perspectives. It presents policies, projects and practices for the sustainable development of the Baltic Sea Region from various perspectives such as tourism, spatial planning and climate change.

We hope this periodical will give readers an insight into the diversity and potential of innovation and education for sustainable development, and trust that you will find it both interesting and informative.

Dörte Ratzmann,  
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety  
EcoRegion Project Lead Partner

Introduction
Foreword

Dear Reader,

The aim of education for sustainable development (ESD) is to empower people to participate in shaping a sustainable future. This requires a re-orientation of current education systems. ESD should develop individuals’ values, knowledge, skills and competencies for sustainable living and participation in society. ESD is characterized by contextual and locally relevant learning. Although no universal model of ESD exists, there is broad agreement on the characteristics of such education: ESD should be interdisciplinary, holistic and value-driven. It should promote critical thinking and problem solving, include a variety of learning and teaching methods, and encourage participation and collaboration.

The World Commission on Environment and Development already made the relationship between education and sustainable development explicit back in 1987. In addition, an entire chapter in Agenda 21 was devoted to education, public awareness and training. The launch of the UN Decade of Education for Sustainable Development 2005-2014 re-affirmed the strong consensus in the international community on the importance of education in the work towards sustainable development. The overall goal of the Decade is to integrate the principles, values, and practices of sustainable development into all aspects of education and learning. Moreover, “Innovation and Education for Sustainable Development” is one of four strategic areas of cooperation as outlined in the CBSS Strategy on Sustainable Development 2010-2015.

The aim of this issue of “EcoRegion Perspectives” is to embrace the diversity of views and approaches to ESD in the Baltic Sea Region. We have therefore collected contributions by various stakeholders, including policy and education professionals, as well as representatives from non-formal education sectors and regions involved in sustainable development initiatives. In line with the characteristics of ESD, it is our hope that this issue will encourage debate and bring forward discussions to support the implementation of ESD in the region.

Enjoy the reading!

Nina Elisabeth Høgmo and Mari Ugland Andresen, 
Norwegian Centre for Science Education 
CBSS Expert Group on Sustainable Development - Baltic 21 / Education Sector Network

Content

Policy
6 Halfway into the Decade of Education for Sustainable Development
9 Cooperation on Education for Sustainable Development in the Baltic Sea Region
12 What is the role of national governments?

Challenges and opportunities
14 Meeting the challenges of the 21st century
17 Reorienting school education: experiences from Norway
20 Transition or transformation? Tracing inclusive education
22 Walk the line: the challenge of collaboration
24 Development of university curricula and study material
26 The Cemus model for student-run education for sustainable development
28 Rural schools in Latvia

Case studies and projects
31 Woodland education in the Lower Saxony State Forests
34 Social partnerships of pre-schools as a means to support innovative approaches in children’s education and upbringing
37 Garden birdwatch in Nordic countries
40 Beagle: a Pan-European school project on seasonal changes in trees
44 Environmental activities as a way to develop children’s commitment
46 The Leonardo project AIRE
49 Environmental education for kindergarten and school children in Kaliningrad

Experiences from sectors and regions
50 Spatial planning for education
54 Competences needed for eco-innovations: lessons learned from the SPIN project
57 About the significance of local knowledge, education and innovation in agriculture for sustainable development
60 Finding today the solutions for the sustainable land use of tomorrow
62 Introduction of environmental education into youth culture
64 Education and Innovation for sustainable development in Riga

Annex
66 References
Main policy developments
In March 2000, education ministers from the Baltic rim countries met in Stockholm. This meeting was part of the Baltic 21 process, launched four years earlier with the aim of creating an Agenda 21 for the Baltic Sea region. The Baltic, an inland sea, had become severely polluted and powerful long-term measures were considered essential if it is to be restored. To this aim, seven reports from different sectors were prepared, urging among others that educational systems become aware of such problems and that they contribute to solving them. The March meeting in 2000 adopted the Haga Declaration and the education ministers decided to develop an action plan for the provision of education for sustainable development (ESD) in the Baltic Sea region: Baltic 21 Education, see more on this in the article by Ms. Crawford in this issue of EcoRegion Perspectives. Efforts to this end were jointly led by Lithuania and Sweden. Three working groups developed an action plan, which was adopted at a meeting of education ministers in 2002. The process of developing this action plan helped to increase knowledge on ESD among various education ministries and non-governmental organisations (NGOs) and helped ensure that university researchers involved in environment-related training and in international networks redirect their work towards ESD.

The fact that ESD is a vital factor in achieving sustainable development was acknowledged at the summit in Johannesburg in 2002 and by the UN General Assembly decision, which declared the decade 2005–2014 to be the UN Decade of Education for Sustainable Development (UNESCO). In 2003, to support efforts for ESD in the Nordic countries, the Nordic Council of Ministers hosted a conference on ESD in Sweden with the participation of most Baltic countries. At the end of 2002 the UN Economic Committee for Europe (UNECE), composed of 56 member states from Caucasus to North America, started developing an ESD action plan, which was adopted at a ministerial meeting in Lithuania in 2005. The UNECE action plan has since become one of the foremost drivers of ESD in these countries.

Sustainable development as a guiding principle in education
Sustainable development must be the guiding principle both in the daily life of education institutions and in long-term planning. This requires everyone at schools and universities—teachers, researchers, adult educators, pupils, students, school managers, parents and community representatives—to discuss how to best direct activities in order to support the development of a sustainable society. This presupposes, of course, that school and university regulations and curricula support such developments.

The responsibility of the EU
Political leaders in the EU and particularly Ministers of Education have a special responsibility in promoting education as the key agent for achieving sustainable development as this is an overall objective of the European Union and as the European Union was a main driving force behind the decisions taken in Johannesburg. Education systems have to be adapted to the needs of sustainable development and this applies to all countries of the world. Nevertheless, especially in our part of the world, the wealthy part, this seems to be most needed, as we are responsible for the biggest “ecological footprint”. General education is not able to change production and consumption patterns – on the contrary, the higher the average level of education, the greater the destructive impact on the planet.

A participative approach
ESD must reflect all three dimensions of sustainable development—economic, social and environmental. Sustainable development should not be seen as a new field of study, but rather as a perspective that is added to all school and university subjects. The sustainable development perspective shall support teachers to select relevant contents: it is important to deal with real-life issues, that can be influenced and that have an impact both locally and globally. The work of the school must therefore also be directed towards society, towards cooperation with people and organisations outside the school. Active participation shall be promoted in pre-schools and allow pupils to take part in planning activities. Students and pupils shall be considered as full citizens even if they are still taking part in an educational programme.

The role of Higher Education Institutions
Universities all over the world play a major role in the development and dissemination of ideas on ESD. We should therefore think back to the UNESCO international conference “Pathways Towards a Shared Future: Changing Roles of Higher Education in a Globalised World” and its concluding recommendations for Higher Education Institutions (HEIs):

a) University authorities should draw up action plans to ensure that education is indeed characterised by a sustainable development (SD) perspective.

b) The boards of the faculties should assume responsibility for mainstreaming SD/ESD into all educational programmes. This should be done through a participatory process involving students and student organisations.

c) The boards of the faculties should improve opportunities for all members of the university community including students to become competent in SD and to engage with the (local) civil society.
Innovation and Education for Sustainable Development

Perspectives

Policy

From Moscow to Reykjavik – good ideas are there to be spread! The Baltic Sea Region is home to a large number of highly educated people, as well as excellent research institutions. Our region is often considered as leading globally in the development and distribution of eco-innovations. However, in order to maintain this leading position, we have to continue to promote education for sustainable development (ESD) at all levels of education.

Despite the regions’ steady commitment to sustainable development and education, challenges still remain to accommodate ESD teaching and learning into formal education programmes. Lack of capacity among educators and ESD facilitators often leads to a situation where sustainable development is understood as a separate issue and system thinking and transdisciplinarity are not being developed and integrated in education. ESD methodology, even though available, has not yet been spread to all schools and other educational institutions. With the absence of nation-wide strategies and amended curricula in many countries, it remains voluntary for schools to implement the changes necessary for ESD. The boundaries between environmental education (EE) and ESD are often vague and in some countries there is a direct continuum with ESD building on EE. A strong history in EE most probably influences the meaning of ESD in these countries. However, if this connection is absent, or if EE has a narrow meaning (i.e. environmental security), then ESD may be more easily developed and given a meaning on its own terms. Countries may adopt different approaches towards ESD, whether it is emphasizing social learning, capacity-building and civic participation, or by taking a more instrumental approach and focusing on behavioural patterns. In any case, innovations in teaching and learning methods are necessary, in order to strengthen people’s knowledge about sustainable development. Training needs to be provided to all groups of professionals, and lifelong learning opportunities should be accessible to all members of society. However, in order to respond to these needs, it is also necessary to have a large number of highly qualified trainers, and this is yet to be achieved.

Baltic 21 and Education for Sustainable Development

Baltic 21 works with all aspects of sustainable development in the Baltic Sea Region. Today, we have over 200 partners working together on Baltic 21 Lighthouse projects, which are our main tool to demonstrate sustainable development in practice. Currently, we have projects in the fields of eco-innovation, education for sustainable development, promotion of bioenergy, adaptation to climate change and more. We bring together experts from governments, NGOs and stakeholders. Together, we develop hands-on projects and turn results into policy recommendations. In January 2010, Baltic 21 became integrated into the Council of the Baltic Sea States (CBSS), which also has education as one of its long-term priorities.

D) The university managements should create an organisation/organisation structures with a cross-disciplinary mandate to promote ESD activities.

e) The universities should engage in joint learning experiences/create strong partnerships with companies, governments, NGOs etc. on SD/ESD.

f) HEIs should become models of SD, not only in what is taught but in how all manner of university activity is carried out, i.e. purchasing policy, campus greening, employment policy, equity and other such issues.

g) The boards of the faculties should earmark development funds in order to achieve the above objectives.

(UNESCO, 2008)

It is often the case that universities proudly declare ambitious objectives in the field of research. Nevertheless, bearing in mind the challenges facing humanity, ambitions in the field of education offer should not be put aside.

Above all, universities should reflect on what ESD can offer them. The universities that strive to improve the quality of their educational programmes must embrace the fundamental ideas of ESD and put them into practice. I wish that all universities, and in particular those that are referred to as prestige universities, both compete and cooperate with each other to become forerunners of “Universities for a Sustainable Future”.

The role of legislation and public opinion

Legislation could help emphasise the importance of sustainable development. Five years ago, the Swedish Government proposed to amend the Higher Education Act. The Parliament approved the amendment so that, with effect from 1 February 2006, “in their activities, higher education institutions shall promote sustainable development that ensures present and future generations a healthy and good environment, economic and social welfare and justice.”

The political will and responsible leadership for tackling many of the major challenges facing humanity can only be created by a well-informed and educated public opinion. The world needs a public opinion, which in democratic elections elects political leaders who are able to take responsible and long-term decisions. This is the whole point of education for sustainable development and regardless of our place in the education system; we must constantly keep the future of our children and grandchildren in mind.

www.desd.org

Mia Crawford

Senior Adviser & Head of Baltic 21 Unit
Secretariat of the Council of the Baltic Sea States (CBSS), Sweden
Baltic 21 has a long history of working towards a wider deployment of ESD policies, contents and methods in the Baltic Sea Region, see more information on this in the article by Lindberg and Jakobsson in this issue of the EcoRegion Perspectives. In 2000, the Ministers of Education of the CBSS member states met in Stockholm and agreed that, in order to achieve sustainable development in the region, it is necessary for the general public to get a basic understanding, competences and skills on sustainability, by means of schools, vocational training centers, universities and continuous education at workplaces. The meeting adopted the Haga Declaration, which included an agreement to develop an Agenda 21 for Education in the Baltic Sea Region. Baltic 21 was requested to steer the process of developing the Agenda and to establish the Baltic 21 Education Sector Network.

At the heart of the work of the Baltic 21 Education Sector is the notion that ESD should be pursued at all levels of education and should be seen as a life-long process. ESD should also be seen as a tool to develop sustainable consumption and production as well as a tool to empower people to make informed decisions. Baltic 21 Education Sector addresses the challenges of ESD by creating and increasing the awareness of sustainable development at all levels of education. The Baltic 21 Education Sector has also been active at the policy and political level. The Baltic 21 Education Sector provided policy input to the CBSS, EU and UN, most notably the UN Decade of ESD (2004-2015).

CBSS and Education for Sustainable Development

In September 2007, a high level meeting of representatives of the Ministries of Education and Science of the CBSS member states was held in Riga. The main objective of the meeting was to explore the role and possible contribution of higher education and science to the promotion of sustainable development and competitiveness of the Baltic Sea Region, as well as to analyse the existing institutional frameworks. The meeting acknowledged the role of Baltic 21, and in particular the Baltic 21 Education Sector, in advancing education for sustainable development in the region. As regards higher education, the Baltic University Programme (BUP), which celebrates its 20th anniversary this year, has been the leading network and an active member of Baltic 21 and its Education Sector. The BUP network currently involves about 225 universities and other institutes of higher learning throughout the Baltic Sea region. The Programme focuses on questions of sustainable development, environmental protection, and democracy in the Baltic Sea region. The aim is to support the key role that universities play in democratic, peaceful and sustainable development. This is achieved by developing university courses and by participating in projects in cooperation with authorities, municipalities and others. Enhancing cooperation between universities in the Region on ESD is also prioritised in the EU Strategy for the Baltic Sea Region and is highlighted as a flagship project in the accompanying Action Plan to the Strategy.

The recently adopted CBSS Strategy also highlights Education for Sustainable Development as one area of strategic cooperation for the years 2010-2015. The Strategy calls for actions to enhance ESD by promoting transdisciplinarity and new teaching methods and by developing new study material. Sharing good practices on teaching methods and new study material will mainly be carried out within the EcoRegion project which has so far gathered around 50 good practices related to education. As regards new study material, the project Ecosystem Health and Sustainable Agriculture are currently developing three course books for Masters level on sustainable agriculture, land use, rural development, ecosystem health and management. To facilitate the adoption of ESD, policy development is a prioritised task of the Baltic 21 Education Sector Network. The Sector recently provided policy input to the CBSS Ministerial Session in June 2011, in which the Sector would like to see that CBSS invites the Ministers of Education to acknowledge their responsibility and strengthen political recognition of, and collaboration for, Education for Sustainable Development in the Baltic Sea Region.

Taking Education for Sustainable Development to the next level

Societies that base their policies on sustainability will have an advantage in tackling future economic, social and environmental challenges. That is why we want sustainable development to be part of all levels of education. By intensifying the transfer of knowledge, from preschools to universities, we hope to take ESD to the next level. Our goal is that the Baltic Sea region will be a leading region in the world on education for sustainable development in the world. However, for this to be realised policy makers and teachers and students around the BSR need to join forces to demonstrate their responsibility and strengthen the political recognition and collaboration for ESD.
What is the role of national governments?

Education for Sustainable Development (ESD) is and will continue to be vital for pursuing sustainability. The importance of ESD is particularly relevant in the Baltic Sea Region, a region with a high concentration of industrialised nations and where awareness of environmental problems has not always been translated into action. The goal of managing today’s resources so that they may be available to future generations – as claimed by the concept of Sustainable Development – is not easy to reach. Indeed, in order to achieve this ambitious goal, it is important that government agencies and education institutions become engaged in the sustainability debate, not superficially as it has largely been the case until now, but in a deeper manner not seen before. The heterogeneous nature of Baltic history and culture, combined with current financial constraints, has had and still has an impact in the way countries perceive environmental issues as a whole, which affects national perceptions and interpretations of ESD.

For example, in some Baltic countries, there are extensive efforts towards incorporating ESD into urban design and development in order to communicate effectively solutions to planners, developers and policy-makers. It is regrettable, however, that such efforts are still limited, since there is indeed a need for a new system that uses sustainability and quality of life, rather than GDP and shareholder’s returns as indicators of development. Although many Baltic countries have embraced the concept of ESD, the actual implementation is still limited and takes place only un-systematically and irregularly.

In addition, many Baltic countries do not have structures in place to support it. This is partly due to the fact that in most cases there are no specific budget provisions for ESD. The lack of financial resources, however, is not the only problem. Further barriers to the implementation of ESD in both formal and non-formal education include:

• logistical problems (e.g. lack of means to organise field trips)
• difficulties in fitting ESD into curricula
• inadequate or limited teacher training for ESD
• limited teaching materials on ESD

Generally, to promote ESD in the Baltic countries, it is necessary to encourage people to live in a more sustainable way. Despite this mixed background, it is meaningful to talk about “ESD in Europe”, as the European Commission has a history in the development of joint strategies to promote environmental education, and more recently, ESD.

In 1991 the Pan-European “Environment for Europe” Ministerial Conference was held in Dobris, Czech Republic. Many such conferences have been held at regular intervals since then. The Fifth Environment for Europe Ministerial Conference, which took place in Kiev in 2003, called for and led to the emergence of a UN Economic Commission for Europe (UNECE) initiative on ESD. At the Conference, all Ministers gave the green light to draw up a regional Strategy for ESD. Progress was reviewed at the sixth Environment for Europe Ministerial Conference, which took place in October 2007 in Belgrade, Serbia. At the Seventh Environment for Europe Ministerial Conference, which will take place in Astana (Kazakhstan) in September 2011, an assessment of the current progress will also be performed and further action will be agreed on.

The implementation of a regional Strategy for ESD in Europe has been a challenging exercise for all those concerned. Both education per se and sustainable development are complex topics. Therefore, it was crucial to develop the Strategy through a participatory process involving governments, UNESCO, NGOs and other stakeholders.

For the implementation of the Strategy, UNECE countries agreed to develop indicators, organise thematic and sub-regional workshops and compile good practices in ESD. So, a key question is now:

What should national governments in the Baltic do, in order to promote ESD?

On a Baltic scale, the Baltic University Programme (BUP), one of the world’s largest sustainability networks, with over 200 member universities, gives interesting examples of integration of ESD in further education. Based at Uppsala University’s Centre for Sustainable Development in Sweden, BUP runs educational programmes and projects which have a strong cross-sectoral nature, reaching planners, architects, engineers, teachers and other stakeholders, bringing sustainability closer to their professional lives. Some examples of what national governments can do are:

• cater for a greater integration of ESD in professional education,
• promote ESD in further education programmes, not only in technical fields but also in management programmes or even business education,
• provide more opportunities for teacher training, so that teachers may feel more comfortable in tackling matters related to ESD in school programmes.

This list is by no mean comprehensive and is solely meant to illustrate some of the concrete activities that may be implemented. Unfortunately, many examples of ESD implementation in education programmes are, for various reasons, poorly or often not documented at all. However, the above-mentioned examples of action offer a snapshot of potential benefits derived from including sustainability components in further education schemes, such as improved competitiveness and job creation, along with a better understanding of sustainability principles. In order to realise the potential of ESD in Europe, it is necessary for national governments to act to address the barriers that currently exist in relation to the implementation of ESD. They can concretely do so by:

• producing a strategy, action plan or guidance document on ESD to indicate the path a country intends to follow
• establishing a formal structure at the ministerial or sub-ministerial level, which takes responsibility for coordinating ESD;
• making provision of financial support to ESD initiatives in a structured manner, e.g. as part of annual or bi-annual plans.

There is a lot of room for improvements given the current level of emphasis placed on ESD in the Baltic Sea Region. Overall, current trends are positive: we can count on well-organised structures and an institutional support. It is now our task to take advantage of this momentum and push the cause forward, making sure that the debate on ESD goes well beyond a school or a higher education context, and finds its ways to the heart of society.

Walter Leal Filho
Senior Professor, Hamburg University of Applied Sciences, Germany

Policy

Innovation and Education for Sustainable Development
Meeting the challenges of the 21st century

As the UN Decade of Education for Sustainable Development is coming to an end, we need to gear up our efforts and make sure that our actions and goals are in tune with the scale of the transition to sustainability. The context is well known. The coming few decades – the active professional lives of today's pupils and students – will mark some of the greatest transformations that humanity has ever seen. The 21st century is an age of converging social, economic and ecological crises. Not only is the climate being altered in catastrophic ways: the health of many essential ecosystem services is also at stake. In order to preserve a "planet similar to that on which civilization developed and to which life on Earth is adapted," we need to drastically reduce global CO2 emissions and decrease the concentration of CO2 in the atmosphere. Many of the rich countries are in the midst of an economic crisis, while poor countries suffer from what the World Bank calls "a global development emergency". The demographic structure of the planet's population suggests that there will be around 9 billion people on the planet by 2050, most of them in cities. Sustainable development is essentially about turning these trends and creating a future that is attractive, sustainable and fair. Simply put, we need to make possible for an estimated nine billion people by 2050 to live decent lives that are not dependent on fossil fuels or on eroding renewable resources. This transition calls for a thorough restructuring of our social, economic, technological and cultural systems: a transformation of our societies on a scale comparable to the Agricultural and Industrial Revolutions. To cling on to the business-as-usual in this context is not an option: it will drive societies and ecosystems into certain collapse.

Education for Sustainable Development

When working with Education for Sustainable Development (ESD) we need to keep the scale of this transition in mind at all times. Through its selection of particular knowledge and skills, but also by promoting certain values and world-views, education shapes our chances of making it through the transition to sustainability successfully. Education is an essential part of the solution but also a large part of the problem. When we work with adapting current education to meet the needs of the 21st century, we need to ask questions such as: What skills and knowledge will be needed in the transition to sustainability? What values and world-views? In what ways is education currently promoting unsustainable practices and behaviours and how can that be changed? System thinking, collaboration and creativity, but also empathy and honesty, are some of the skills that are most often proposed as crucial for the transition to sustainability. While the list is incomplete, it can help us to start evaluating if our current curriculum is in tune with the needs of the future. Perhaps even more importantly, we need to keep in mind that ESD involves substantially more than simply supplementing existing educational programmes with a few new perspectives or course modules: it demands profound changes in education's form and in how it is organised. This means that we need to reconsider the relations between teachers and students in the classroom, and work with participatory and active forms of learning, where students are regarded as co-producers of knowledge in a joint learning process rather than just consumers of knowledge. This is especially important since sustainable development is a generational issue that will affect the youth of today more than the administrators and teachers that usually define what it is to be learnt.

The Democratic Challenge of Knowledge Intensive Societies

The increasing knowledge intensity of today's sustainability challenges is potentially a democratic problem. Sustainable development cannot be left to a well-informed elite of "experts." Democracies are dependent on a broad participation by informed citizens in a public discussion on the goals, means and ends of society. Now, as our societies stand before the greatest transition since the advent of mass democracy in the early 20th century, this public discussion is more important than ever. The quality of this discussion – which determines the chances of sustainability initiatives to gain popular support – depends on what philosopher Arne Vetlesen refers to as "the lowest common knowledge denominator" of a society. In other words, it is not sufficient that parts of the population are well informed...
about sustainability issues if other parts are not. A number of current trends threaten to decrease the lowest common knowledge denominator of our societies, ironically when high quality information is more available than ever before. One important trend is the increasing commercialization of media, with channels being tailor-made for different interests and consumer segments. The same trend is to a lesser extent emerging within our educational systems, as schools are becoming privatized – making excellent education available for those with the resources to choose, but putting the access to high quality education for everyone at risk. The increasing dependence on social media and blogs for information is another trend that is making people actively choose which information they want to receive, which could lead to significant knowledge gaps in certain areas. More than promoting democratic values, the traditionally strong democratic component of ESD therefore needs to ensure that everyone has a good enough understanding of sustainability to participate in a public discussion on where our societies are headed. It is essential that sustainability becomes a core part of all educational programmes at all levels. To adjust to the new media climate, critical thinking skills are more important than ever, and also skills to analyze the information flow and choose relevant sources of information. Reading, writing, and arithmetic were promoted as core skills in the education of the 20th century. Are there additional skills – such as system thinking, collaboration, critical thinking and creativity – that everyone needs to learn in order to participate effectively in the societies of the 21st century?

The Power of the Positive Example
In order to make change possible, educational institutions need to embrace the power of the positive example. Social psychologist Harald Welzer suggests that change happens from changing organisations and communities in order to create prototypes that people can learn from and get inspired by (and not by writing another sustainability report). To facilitate learning for sustainable development, the learning environments themselves must become sustainable, both regarding the use of energy and materials, travels and meetings but also in their organisational structures themselves. The growing number of university presidents committing to carbon neutrality in the United States is one example of how educational institutions are starting to take this challenge seriously. This also affects teaching. While education has traditionally dealt with problems and focused on problem solving, the transition to sustainability calls for encouraging great amounts of creativity and engaging students and pupils in processes where new possibilities for sustainable futures can be formulated and evaluated. These processes could also help stimulate the extraordinary leadership, global responsibility and optimism that the students of today will desperately need in order to succeed with sustainable development in the coming decades.

Challenges and opportunities

Challenges for ESD
Key challenges include the establishment of good learning arenas through collaboration, the development of abilities to communicate across disciplinary and sectoral boundaries, and the consideration of pupils’ individual abilities. Pupils and schools have to be active partners in and contributors to sustainable development. Schools need to be regarded as credible partners and not as “recipients” of information. There is a need to examine local learning systems and clarify roles and responsibilities, as well as to indicate ways for efficient cooperation of sectors.

ESD implies that school education pursues a wider aim than in the past: it prepares pupils for their role as citizens and it educates FOR Sustainable Development rather than just ABOUT it. In brief, ESD calls for a reorientation of existing school education.

School plans for ESD
Furthermore, it is necessary to look at the school itself: what should a local plan for ESD look like? The figure below shows such plan at the school level.

Plans at the school level are needed. They consist of the following elements: identification of issues, discussion on the competence to be developed, decision on what learning arenas should be used, identification of partners, collection of background information, definition of time schedules for the learning experience, including reflection and reporting.

Teachers argue that there is not enough time for planning, that there is no space for developing ESD contents, that there is no experience with cooperation across disciplines, that reporting is too time-consuming, etc. In order to carry out ESD properly, schools need to be learning organisations.
The connection between school development and ESD

<table>
<thead>
<tr>
<th>School development is aimed at:</th>
<th>ESD asks for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes in the organisation of the school</td>
<td>Room for cooperation with external actors</td>
</tr>
<tr>
<td>Analyzes of the challenges related to school development</td>
<td>More cross curricular work and work on complex issues</td>
</tr>
<tr>
<td>Establishment of routines for cooperation between teachers</td>
<td>Cooperation between teachers from different subjects</td>
</tr>
<tr>
<td>Establishment of innovative learning arenas</td>
<td>Usage of innovative learning arenas</td>
</tr>
<tr>
<td>Development of routines for reflection on the learning and teaching process</td>
<td>Reflection on the issues at stake</td>
</tr>
<tr>
<td>Recognition of the need for changes in the teaching and learning process</td>
<td>New ways of teaching and learning</td>
</tr>
</tbody>
</table>

School innovation

The aim of the EU Comenius Life Long Learning network programme “SUPPORT: Partnership and Participation for a Sustainable Tomorrow” was mainstreaming ESD in the educational sector. In an external evaluation report, Michaela Mayer stresses the importance of school development. In fact, results of SUPPORT show that ESD and school development could be regarded as two sides of the same coin. (See table below).

Tools

An interactive website, www.miljolare.no, was developed to give schools concrete guidance in the area of ESD. The goal was to establish a network that could provide academic and methodological support for students by offering an action-oriented and interdisciplinary education. The learning activities on the website are based on the following principles:

- The activities are concrete and locally based
- Pupils and schools collaborate with each other and with research and management institutions who develop the activity and/or use the results
- The activities include suggestions for further work, discussion and reflection to develop insight and understanding
- Pupils enter reports and results in the form of text, data and photographs using templates and electronic forms on the website. The shared format and databases allow schools to study, discuss and compare their results and reports with those of other schools.
- The use of scientific tools in real-life rather than hypothetical situations represents a “win-win” situation in which the results of pupils’ learning are of public interest and value. Pupils learn about science - but also about how society works with sustainability issues at the local, national and international levels. Both pupils and schools realise that they can contribute to society and sustainable development.

One of the challenges for implementing the www.miljolare.no website has been to communicate adequately that it is a supportive framework, not a traditional set of ready-to-use classroom materials. The educational experience cannot be prefabricated. Both the educational activity and the learning outcomes have to be created through the work of the teacher, the pupil and all collaborating partners. The action learning cycle includes planning, carrying out activities, observing, questioning, analyzing, discussing, reflecting and reporting. The potential for the work of pupils and schools to benefit society needs to be visible and effective. Pupils and schools become active partners in and contributors to a positive and sustainable development.

The challenge of mainstreaming

The central education authorities face several dilemmas when designing strategies and instruments for ESD. A so-called instrumental approach that provides schools with ready-to-use materials and activities might appear visible and effective. More ambitious programmes requiring greater preparation or time may also be offered, but fewer schools and teachers are likely to carry out the activity and it is likely to be viewed as ineffective and unsuccessful. The dilemma is that “quick and easy” activities tend to be less effective in developing the needed competencies at both school and pupil levels. Wals et al. contrast the learning impact of the so-called instrumental approach to ESD as follows: “Within the more instrumental approaches much time is spent on describing measurable outcomes in a SMART way in that they need to be specific, measurable, realistic, time-specified (SMART). To have an exhaustive list of indicators seems very handy for becoming SMART in working toward a more sustainable world. Ironically perhaps, working in such a way might take the learning out of moving toward a more sustainable world, which is the key element of a more emancipatory approach.”

www.support-edu.org
**Introduction**

The focus of this article is school and education ‘for all’ from the perspectives of transformation and sustainability in local communities. From my point of view these perspectives may inform the examination, implementation and innovation in education. I highlight this due to the observation that when talking about inclusion in education, the rhetoric of official policy is taken for granted. Researchers often seem to abandon a bit too fast the questions belonging to attitudes and value system of the inclusion idea and the basic assumptions connected to this idea as well. If we accept the principle of inclusion to guide development in education, it is my opinion that we have to be concerned about the connected values both in the school system, in the society in general and in the local community of the school. We should be aware that education seems to recreate and reproduce the status quo of a society. On the other hand it also has a role to play for progress and prosperity (Lipsky et al, 1990).

**Local knowledge**

During the last years there has been an increase in refreshing critical voices questioning the processes of knowing and validating knowledge and disseminating it across national and global spaces. What constitutes valid knowledge and how should this knowledge be shared internationally and globally is a subject continuously debated. There is no academic closure on this subject. Histories and experiences of historically subordinated people’s knowledge have been left out of academic texts and classrooms or have been erased out of them. As we are now witnessing ‘a crisis of knowledge’, there are increasing demands for transforming our way of understanding knowledge, learning and teaching. As a result of colonial, patriarchal, corporate, exploitative, and often ecologically destructive development models, the body of knowledge associated with the long-term occupancy of a certain place, is conceptualised as indigenous knowledge (Dei 2002). The concept of indigenous knowledge may be introduced to examine the implications of local understanding of nature, society and culture for the development process. Indigenous knowledge differs from conventional knowledge because of an absence of colonial and imperial imposition. The notion of indigenousness is central to power relationship and dynamics in society. Indigenous knowledge affirms that the interpretation and analysis of social reality is subject to different and sometimes oppositional realities. Indigenous knowledge systems and traditions may also contain sites and sources of cultural disempowerment for certain groups, particularly women and ethnic or cultural minorities. Archie Mafeje (1992) points out how the indigenisation of the intellectual discourse in Africa reminds African intellectuals of the guiding principle in the Socratic thought, “know thyself”. There he finds that there is a ground for a new reconstruction and self-realisation. The African-Canadian professor in sociology, George J. Sefa Dei shares this opinion (Dei 2002: 71), and he moves a bit further: “indigenous knowledge as knowledge accumulated by a group of people, not necessarily indigenous, who by centuries of unbroken residence develop an in-depth understanding of their particular place in their particular world. These thoughts remind us of the Brazilian social reformer and educator, Paulo Freire. It is Freire’s opinion (1970) that the critical consciousness of the cultural and historical roots of people, as it is expressed and understood from the perspectives of the people themselves, is the foundation of their cultural emancipation. His central message is that if people only learn to the extent of establishing participatory relationships with the outside world, they gradually become dependent and oppressed. Under such circumstances their ability to revitalise and maintain themselves culturally, socially and economically through a self-determined process of education is significantly diminished, and gradually destroyed. The interest in indigenous knowledge is quickly growing in Western societies, and is manifested in several academic and cultural projects (for example: Stephen 1996; Warren et al. 1995; Schoenhoff 1993).

**Views on development**

Inclusion is often exemplified as viewing diversity as a gift of teaching and sharing knowledge about the contributions of diverse cultures to enrich plural communities. This falls within purview of multicultural perspectives of schooling. “Diversity” and “voice” when acknowledged or taken up in schooling, address various relations to the norms and values of the dominant society. Generally, inclusive schooling in this approach has the educational agenda to develop better intergroup communications, enhance cooperation and tolerance for people of diverse backgrounds, and foster respect for social difference. There is a kind of romanticisation of “the other” without necessarily centering marginalised groups in the dominant cultures of schooling. They remain peripheral to dominant educational discourses and practice. This approach to exclusion does not lead to equity, nor does it challenge power, identity or representation issues in education. In fact, the approach fails to rupture difference as the context for power and domination in school society. My judgment is that many of the research and pedagogical practice initiatives are within this perspective. The second approach to inclusion adopts “diversity as a critical perspective”, where schooling is seen as racially, culturally and politically mediated experience. This approach deals directly with marginalization and exclusion in school contexts by centering all human experiences in the process of learning. In the analysis, the focus is placed on the twin notions of power and domination in order to understand and interpret social relations and structures. It seems to be a critical integrative perspective on schooling and education that is able to cultivate new knowledge and oppositional scholarship. This is an approach of critical examination of the different histories and experiences of domination and subordination in plural communities. The emphasis here is on transformative educational practices, which would ensure that students are equipped to challenge and resist dominance and oppression in the multivariant forms of racism, sexism and heterosexism, classicism and ableism.

Critical educational practices deal specifically with the understanding of and resistance to hierarchies and systems of domination that permeate society and systematically exploit and control people. The critical approach to inclusion has a transformative educational and social agenda. It focuses on the asymmetrical power relations between and among social groups within the school system, and seeks a redistribution of power to ensure fair representation, not only of the actors themselves, but also of the subject’s knowledge production. To support the idea of inclusion it seems to be of importance to work toward a critical integrative framework on these subjects.

www.imfn.net
www.unesco.org/mab
Walk the line: the challenge of collaboration

“Sustainable development is about coping with risks even though our knowledge is uncertain. It is about difficult and complex issues. The challenge of education is to motivate people to not react by neglecting these demanding and unpleasant matters but by creating spaces, and by facilitating processes, characterised by critical, innovative and action oriented social learning.” (Laessoe, 2009)

Introduction
This short article will discuss perspectives for Regional Centers of Expertise as platforms for mutual learning. The article is based on a current Ph.D. project, which focuses on how Education for Sustainable Development (ESD) takes form as a didactic practice in collaborative processes among researchers and teachers, based on interviews in Ireland and Denmark.

Regional Centers of Expertise
UN Regional Centers of Expertise on Education for Sustainable Development (RCE) emanate from the idea that actors within formal, non-formal and informal education meet and collaborate on developing ESD regionally by ‘sharing information and experiences’. In order to leave space for regional variations, the aim of the RCE framework is broadly defined as follows: “RCEs aspire to archive goals of the UN Decade of Education for Sustainable Development (DESD, 2005 to 2014), by translating its global objectives into the context of the local communities in which they operate.” (www.ias.unu.edu).

Today, there are about seventy RCEs all around the world. RCEs are often anchored at a university, thereby offering universities a unique opportunity to collaborate with other actors practicing ESD, such as schools, museums, companies and NGOs. As such, the RCEs often work more like a network than a center. Indeed, the ideal of ‘sharing information and experiences’ raises the question of how to learn from each other’s experiences while working within so very different practices.

As part of this Ph.D. project, two research development projects, with the aim of integrating ESD in primary and secondary schools in Ireland and Denmark respectively, were studied. The projects were based on principles of participation on two levels: both among researchers and teachers, and among teachers and pupils. As the researchers invited the teachers to participate in the development projects, the intention was not to offer some kind of ‘finished ESD package’, but to introduce various ways of doing ESD in schools and to support the teachers’ own development of ESD teaching. As such, both projects were formed around the ideas of dialogue, participation, experimentation and ownership. The researchers did introduce the teachers to certain key principles and issues of ESD, partly inspired by the UN definition of ESD, partly drawing on existing theory within ESD, and finally framed within national education traditions. On one hand the researchers intended to introduce key principles and ideas of ESD, and on the other hand they wished to work with open-ended processes where you never know the result in advance, linked to the participatory approach – a tricky balancing act, as stressed by one of the Danish researchers.

Challenges and Perspectives
While teachers and researchers form part of different practices, navigating within different contexts, new practices are also established as they struggle together with ESD in schools.

When describing the collaboration, teachers use words and phrases like; ‘an eye opener’, ‘turned my way of thinking upside down’, ‘rewarding’, ‘developing’, ‘fun’, ‘creating space for discussion in a busy day filled with practical demands’ and ‘it is nice that the researchers face our reality in school’. However, interviews with teachers and researchers also point to a number of issues, which challenge the collaborative processes on ESD.

Common for the teachers in Denmark and Ireland who participated in these projects was an initial and personal interest in sustainable development and environmental issues, which they all find important to integrate in school. ESD, as it was presented by the researchers however, seems unfamiliar to the teachers. This includes new dimensions, perspectives and methods compared to existing teaching practice, as stressed by one of the Danish teachers: ‘...it is not a road which is made, sustainability in school...it is most definitely not an asphalted road’. Thus, what are the strengths of the collaboration, in view of perspectives for social learning on ESD? One of the issues indicated by this research is the importance of images. Images were used in various ways in the two projects – for instance at a start-up workshop for teachers and researchers in Ireland. Here a number of images were placed on the ground, representing pollution, nature, the twin towers collapsing, and many other objects. The teachers were meant to pick up a picture appealing to them and tell about the social, ecological and economic dimensions of ESD, based on their choice of picture. The images here seem to exceed the teachers’ notion of the ‘correct’ knowledge and understanding of ESD. Further, the images seem to replace the teachers’ limited language on ESD, by allowing for their personal and professional associations in relation to sustainable development.

www.dpu.dk
Development of university curricula and study material

A clear obstacle to education for sustainable development is the slow progress with introducing adequate study materials in university curricula.

The need to advance environmental education and education for sustainable development is stated in several political documents and declarations by the United Nations, the European Union, ministerial conferences (e.g. in the Bonn Declaration), regional initiatives and NGOs.

Nevertheless an aspect of major concern remains the “training of trainers” and the introduction of environmental education and education for sustainable development at the university level. It should be recognised that in these fields progress is not as fast as it should be and that significant achievements are needed.

This is a problem in Latvia. Until recently, only 1.5% of all university students chose to attend courses on environmental science and sustainable development. In order to encourage students to study these subjects, the University of Latvia developed specific university courses. The initiative was supported by a project financed by Norwegian grants. “New generations need to know what the real state of the world is, and how to avoid possible difficulties in the future,” says Professor Maris Klavins, senior expert of the project.

Publication of 8 textbooks

The main achievement of the project was the development of 8 academic textbooks on environmental and sustainable development aspects. The project was implemented in partnership with the Baltic University Programme, a network of 220 universities in 14 countries in the Baltic Sea Region. During the course of the project, environmental scientists and educators from several European universities, including Hamburg, Oslo, Uppsala, Saint Petersburg, and Tallinn, were invited to provide advice on how to best teach environmental science.

These consultations resulted in the development of 8 academic textbooks:

- Environmental Education at Universities
- Environmental Pollution and its Impact
- Environmental Technologies
- Ecology, Nature Protection
- Environment and Economy
- Environmental Management
- Environment and Sustainable Development
- Environment and Sustainable Development

The textbook “Environment and Sustainable Development” was published in both English and Latvian, and was distributed to universities in the Baltic Sea Region, the USA, Australia, Africa and Asia.

E-learning tools and teaching guides

The project also included the development of curricula, e-learning tools and teaching guides, as well as the organisation of both national and international conferences to discuss environmental education and introduce the educational package on environmental science and sustainable development resulting from the project.

Conclusion

The introduction of education for sustainable development at university level and the “training of trainers” support both research activities and sustainable development. Tailored study materials are necessary to speed up the implementation of education for sustainable development. The above-described project shows that partnerships and cooperation of professionals from different fields and countries can ensure the production of high quality teaching materials.
The Cemus model for student-run education for sustainable development

Today's societies face challenges that put new demands on education and how it is organised. In this context, the Cemus model for student-run, interdisciplinary education for sustainable development is particularly interesting. Cemus at Uppsala University employs students as course coordinators with the task of planning and running a university course in close collaboration with senior researchers and university teachers. This creates interdisciplinary and creative learning processes and gives students a unique and active role in shaping their own education. The courses have proved to maintain a high academic standard, and student-run courses are offered from pre-graduate to graduate levels. The idea that students should take an active part in creating their education is of course not new. Already the early medieval university system in Italy was based on students actively choosing their teachers. Today's sustainability crisis is bringing new importance to this, as sustainable development is a generational issue that will affect the students of today more than the teachers and administrators that usually define what is to be learnt. Cemus was founded on the initiative of students at Uppsala University and the Swedish University for Agricultural Sciences (SLU) in the early 1990s. Students came to Uppsala expecting to gain an interdisciplinary understanding of global environment and development issues. The president of the university agreed, and furthermore, gave the students the task of planning the course. The resulting course, Humanity & Nature, was an immediate success, with around 150 students taking the course in the first years. The successful model was based on students defining what they wanted to learn, experienced academic lecturers, and gives feedback on the course coordinators' proposed structure, literature and schedule. The course work group is responsible for the examination of the course.

• Guest lecturers. The backbone of the course consists of a multidisciplinary lecture series. The course coordinators invite guests from different academic subject areas as well as practitioners to teach in the course. The guests are invited to Cemus because they are passionate about their subject and because of their knowledge and their pedagogical competence. This results in engaging lectures and a participatory discussion climate.

• The Cemus administration supports course coordinators in their work. It consists of a Director of Studies, an Educational Coordinator, Project Assistants, and a Programme Director with experience from both teaching and research.

There is an inherent value in getting students actively involved in creating their education. The work with courses at Cemus brings together students in their capacity as course coordinators with researchers and university teachers in a common work process. This leads to mutually enriching encounters between researchers and students. Cemus is also actively stimulating interdisciplinary activity at Uppsala's two universities. The course work group brings together teachers and researchers from various disciplines that would otherwise not meet, take part in each other's research, or share their perspectives, which potentially catalyzes further interdisciplinary research and education.

The Cemus model for education has four key components:

• Student Course Coordinators. Two or three students are employed by Cemus to plan, administrate and run a university course as a project. The course coordinators plan the general structure of the course, put together a reading list, and invite guest lecturers. They lead seminars and handle the administration of the course.

• Course work group. For each course, a work group is formed which consists of researchers, teachers and sometimes also practitioners from different fields and subjects. The course coordinators work in close collaboration with the work group throughout the planning process. The work group comes up with suggestions for literature and possible lecturers, and gives feedback on the course coordinators' proposed structure, literature and schedule. The course work group is responsible for the examination of the course.

• The Cemus administration supports course coordinators in their work. It consists of a Director of Studies, an Educational Coordinator, Project Assistants, and a Programme Director with experience from both teaching and research.

There is an inherent value in getting students actively involved in creating their education. The work with courses at Cemus brings together students in their capacity as course coordinators with researchers and university teachers in a common work process. This leads to mutually enriching encounters between researchers and students. Cemus is also actively stimulating interdisciplinary activity at Uppsala's two universities. The course work group brings together teachers and researchers from various disciplines that would otherwise not meet, take part in each other's research, or share their perspectives, which potentially catalyzes further interdisciplinary research and education.

The successful model was based on students defining what they wanted to learn, experienced academic lecturers, and gives feedback on the course coordinators' proposed structure, literature and schedule. The course work group is responsible for the examination of the course.

• Guest lecturers. The backbone of the course consists of a multidisciplinary lecture series. The course coordinators invite guests from different academic subject areas as well as practitioners to teach in the course. The guests are invited to Cemus because they are passionate about their subject and because of their knowledge and their pedagogical competence. This results in engaging lectures and a participatory discussion climate.

• The Cemus administration supports course coordinators in their work. It consists of a Director of Studies, an Educational Coordinator, Project Assistants, and a Programme Director with experience from both teaching and research.

There is an inherent value in getting students actively involved in creating their education. The work with courses at Cemus brings together students in their capacity as course coordinators with researchers and university teachers in a common work process. This leads to mutually enriching encounters between researchers and students. Cemus is also actively stimulating interdisciplinary activity at Uppsala's two universities. The course work group brings together teachers and researchers from various disciplines that would otherwise not meet, take part in each other's research, or share their perspectives, which potentially catalyzes further interdisciplinary research and education.

The successful model was based on students defining what they wanted to learn, experienced academic lecturers, and gives feedback on the course coordinators' proposed structure, literature and schedule. The course work group is responsible for the examination of the course.

• Guest lecturers. The backbone of the course consists of a multidisciplinary lecture series. The course coordinators invite guests from different academic subject areas as well as practitioners to teach in the course. The guests are invited to Cemus because they are passionate about their subject and because of their knowledge and their pedagogical competence. This results in engaging lectures and a participatory discussion climate.

• The Cemus administration supports course coordinators in their work. It consists of a Director of Studies, an Educational Coordinator, Project Assistants, and a Programme Director with experience from both teaching and research.

There is an inherent value in getting students actively involved in creating their education. The work with courses at Cemus brings together students in their capacity as course coordinators with researchers and university teachers in a common work process. This leads to mutually enriching encounters between researchers and students. Cemus is also actively stimulating interdisciplinary activity at Uppsala's two universities. The course work group brings together teachers and researchers from various disciplines that would otherwise not meet, take part in each other's research, or share their perspectives, which potentially catalyzes further interdisciplinary research and education.
The aim of this article is: 1) to give an overview of the concept of “rural schools” and 2) to describe Latvian rural schools with a view to ESD (Education for Sustainable Development) and within the sustainability triangle.

Latvian rural schools play a very important role as establishments for education, upbringing and socialization for the majority of rural inhabitants in Latvia. According to research on rural basic schools, the contemporary rural school has become an inwardly inclusive environment. It is an educational environment for the development of human personality and local rural community.

A. Laizane and I. Katane define a rural school as “an educational establishment that is located in the country for educational, cultural and social needs of rural communities”. Nowadays the rural school, as an open educational environment, searches for new opportunities, priorities and directions for sustainable development. According to I. Katane and A. Laizane rural schools are often the only education environments in Latvian regions. They therefore carry the responsibility for the education of the whole local rural community and are formal and non-formal educational environments for pre-school children, pupils and their families, educators and the whole rural community in the context of life-long learning.

Latvian rural schools can be considered to be at the centre of the sustainability triangle as they contribute to environmental, social and economic development.

The first component of the sustainability triangle is environmental development, which was introduced to Latvian rural schools via the Eco-schools Programme and optional courses.

Eco-school is an international programme of environmental and sustainable development education for schools. Thirty-two Latvian schools, including 20 rural schools, were awarded with the internationally-recognised title of “Eco-school” and received the Green Diploma for their engagement in the field of sustainable development education. The Environmental and Educational Fund coordinates the Eco-school Programme; and the Latvian Environmental Protection Fund and SIA “Latvia Statoil” support it financially.

The first optional education programme is “mazpulki”. Mazpulki is an organisation of youngsters established in 1929 with the aim to promote the interest of young people in agriculture. The work of the organisation is led and coordinated by the Latvian Mazpulki board. In cooperation with other educational establishments, local municipalities and businessmen, mazpulki supports environmental protection, facilitates democratic development and civil society, and takes care of the preservation of cultural values. Currently there are 202 mazpulki in Latvia.

The second optional programme is environmental education. The concept of environmental education (EE) refers to “organised efforts to teach how natural environments function and, particularly, how human beings can manage their behaviour and ecosystems in order to live sustainably”. The term is often used to imply education within the school system, from primary to post-secondary. However, it is sometimes used more broadly to include all efforts to educate the public and other audiences, including print materials, websites, media campaigns, etc. Related disciplines include outdoor education and experiential education.

Interviews with principals in rural basic schools and managers of regional educational boards (Laizane, 2010) showed that rural schools turned into multifunctional centres and offer social development, which
Innovation and Education for Sustainable Development

Innovation and Education for Sustainable Development

Case studies and projects

Woodland education in the Lower Saxony State Forests

The Task
The Lower Saxony State Forests is the largest woodland owner in the state and has the task of not only managing and maintaining forests but also of educating the public and making people aware of this particularly beautiful part of the regional landscape. The area is characterised by a functioning and sustainable use of resources dating back almost 300 years. In this context, forest managers fulfil the important role of intermediaries between people and woodlands. These forests can be seen as an important educational resource, which can help to make the concept of sustainability understandable to future generations.

Objectives
The Lower Saxony State Forests is a modern public enterprise with numerous responsibilities. Forest management and timber harvesting are just as much a part of its mission as are nature conservation, the provision of information and educational work. Forestry education has particular significance as it involves more than just the provision of knowledge and information: it offers a unique opportunity to involve children, young people and adults, offer them a better understanding of the complex concept of sustainability and bring them closer to nature. Here sustainability is not just considered in relation to the use of resources, but also in relation to the educational work dealing with economic, ecological, social and cultural aspects. The main aim is to create a strong and lasting appreciation for forests and to encourage people, and particularly young people, to take on responsibility for nature.

The approach
The woodland itself is considered as

Environmental Development
- Eco-schools
- Interest related education: mazpulki (in Latvian); environmental education

Social Development
- Rural schools as multifunctional centres

Latvian Rural Schools

Economic Development
- Communities and schools can work together on economic development
Innovation and Education for Sustainable Development

An educational resource. As a network and complex system, it serves as a paradigm and provides insights into a fascinating world, which is often unknown to modern people. Children and young people in particular should be stimulated to think in a long-term and holistic way and to act accordingly in the future. Modern forest education brings people together in the woods environment or introduces nature issues to schools. The topics are delivered in an action-oriented way.

A constant exchange between forestry experts and educators is important for the success of the teaching aims. Extensive experience in environmental education and gradual introduction of new teaching concepts, such as education for sustainable development (ESD), global learning and social learning, help achieve long-lasting effects.

60 years of experience
The experience of the Lower Saxony State Forests goes back to the early years of forestry education. More than 60 years ago, young people were helping to restock forest areas, laid bare as a consequence of over-use. From this activity, the first forestry youth missions developed. In the Harz district, the first German Forest Youth Hostels were created from original tent camps.

While at that time the concept of forest education was not known, a great deal of activities took place, which today would be understood as such. Through the daily work, young people learned about the woods and nature’s interrelationships. Through the experience, many of them developed a particular sense of community and a sense of responsibility for this precious environment.

There is a great variety of forest forms: spruce woods in the Oberharz, beech forests in the Weserbergland, pine and birch woods in the heathlands extending to the humid forests of the region around Oldenburg.

These forests teach us about the variety of animals and plants, the commercial uses of timber resources, the regional history of the forests as well as the protection of valuable habitats. They also teach us about their role in water and climate protection.

The workers
In the Woodland Education Centres of the Lower Saxony State Forests, education-trained forestry workers work together in teams. They organise woodland-relevant educational education within their particular areas of responsibility, the so-called Education Regions, and they cooperate with schools and other education providers. In the practical work of the missions, experienced foresters take on the task of looking after the pupils or young adults. Certified woodland educators who work freelance for the Lower Saxony State Forests support the educational teams.

The woodland as an educational resource
Humans and forests are the main focus of woodland education. Woodlands are as interesting and varied as the people who have lived from them and with them for centuries. Thus, they are an ecological, commercial, social and cultural reflection of human society.

In the area of the Lower Saxony, there is a great variety of forest forms: spruce woods in the Oberharz, beech forests in the Weserbergland, pine and birch woods in the heathlands extending to the humid forests of the region around Oldenburg.

These forests teach us about the variety of animals and plants, the commercial uses of timber resources, the regional history of the forests as well as the protection of valuable habitats. They also teach us about their role in water and climate protection.

The future
Forest are varied, colourful and attractive, and there is always something exciting to experience and discover. Unfortunately, these days many people are increasingly losing contact with them. Some children and young people have never been to a forest or had the opportunity to create a connection to these environments. Contributing to changing this pattern is what the Lower Saxony State Forests hopes to achieve.
Social partnerships of pre-schools as a means to support innovative approaches in children’s education and upbringing

There are a lot of discussions on open education spaces and favorable environments for children’s development. However, it is important to consider if pre-schools and their teachers are ready to do this and how directors should support teachers’ creativity. Sending teachers to training courses, organising in-service trainings, or compiling individual plans for the teacher’s professional growth could be useless if the teacher is unable to transform knowledge into new educational tools and teaching methods. So, what is the way out?

In my opinion, the teacher should contribute to education and upbringing with own ideas and knowledge in a constant manner. Non-governmental organisations (NGOs) and associations can assist educational establishments, including pre-schools, with arranging continuous formal, non-formal and informal education for teachers.

Eco-Schools/Green Flag
Kindergarten #69 of the Krasnogvardeyskiy district of St. Petersburg has been taking part in the international programme “Eco-Schools/Green Flag” (www.eco-schools.org) since 2003. The programme is run internationally by the Foundation for Environmental Education (FEE) (www. fee-international.org) and is coordinated in Russia by the NGO “Keep St. Petersburg Tidy”. Participation in this international programme helped us get new knowledge and skills and learn about best practices on ESD in the Baltic Sea Region. Besides, it inspired us to develop our own initiatives further. Since then we have planned our activities with children for each academic year according to seven steps of the ISO14001:2004.

STEP 1 - Eco-Schools Committee
STEP 2 - Environmental Review
STEP 3 - Action Plan
STEP 4 - Monitoring and Evaluation
STEP 5 - Curriculum Work
STEP 6 - Informing and Involving
STEP 7 - Eco-Code / rules for sustainable behavior

The Tree of Your Family
One of the campaigns held in 2010 “The Tree of Your Family” is a successful example of turning sustainable development into practice. Within each pre-school programme, children learn about green areas, e.g. children together with teachers watch trees in different seasons and understand that trees are alive and need protection.

Nowadays societies face global problems: for two years the teachers of our kindergarten have been developing ways of explaining to pre-school children the problem of global climate change and how cutting trees can affect climate. This resulted in the development of innovative methods in the work with pre-school children, their parents, as well as various organisations and social partners. Practical activities in the frame of the campaign were tree-planting actions. At first, children, their parents and teachers planted trees not only near the kindergarten, but also near their houses and dachas. Each participating family gave a name to the planted tree and became re-
Birds are everywhere. Most people are able to identify a few species, and surprisingly many know quite a number of bird species. The birds best known to the man in the street are the ones found in the immediate surroundings of the home. When developing bird monitoring campaigns with the intent to have a wide segment of the population report back species observations, it is important to tap into the knowledge that already exists in the target group. By selecting well-known bird species abundant in residential areas as focus species, the basis is laid for generating interest and activity and maximising participation. Creating an opportunity for the target group to draw on pre-existing knowledge is likely to instill an added incentive to take part, and to lower the threshold to actively contribute. In Norway, an estimated 400,000 persons are involved in bird feeding during the winter, and they buy 15,000 tonnes of bird food yearly. It is reasonable to assume a similar bird-feeding activity in Sweden, Finland and Denmark. If a campaign is established that successfully taps into this enthusiasm, there are good chances that it will be a success.

What to do?
In the Nordic Garden Birdwatch participants are encouraged to monitor the birds on their feeders during the last weekend of January. Participants are asked to note the maximum number of each species that are observed along with the type of food on the feeder, temperature, and depth of snow cover. Participants receive user access to an online database, to which they upload their observations.
Participation and data flow in Norway The Garden Birdwatch is a collaboration between the Norwegian Ornithological Society, who are responsible for the promotional activity, and the Centre of Schools’ Science Education at the University of Bergen, who are responsible for the technical solutions (database and web interface) and for providing relevant background material on the website. The campaign is run on the platform “Miljølare.no”, which is a Norwegian school resource on Education for Sustainable Development. At the end of each season, an expert evaluates the quality of the data and validates it. Erroneous observations are removed and borderline observations are corrected or deleted in a dialogue with the reporter. The large volume of data reported throughout the campaign are then exported to the Species Maps section of the Norwegian Biodiversity Inventory Archive (Species Maps section of the Norwegian Biodiversity Information Centre, http://artskart.artsdatabanken.no), which serves as the official Norwegian biodiversity inventory. They are here made available for researchers, management and the general public together with similar data from other sources.

Participation Anyone may participate in The Garden Birdwatch. Participants belong to all ages: from kindergarten, to school age up to senior citizens. This does produce a heterogeneous dataset with a certain amount of erroneous observations, and even though the quality control takes care of most mistakes, it should be kept in mind when using the dataset that it is likely to contain some errors. When focusing on general patterns of abundant species, the large volume of reported observations does, however, dilute the effect of a few misidentified species. In January 2011 observations were reported from more than 5,200 gardens in Norway, and we estimate that at least 14,000 persons took part in the campaign.

Goals
The foremost goal of such a campaign is to contribute to the participants’ knowledge on the biodiversity in their local surroundings, and to provide an opportunity to put this into a wider context. Further, the campaign provides the opportunity to reflect on the connectedness of biodiversity and climate. How do climatic variations affect over-wintering bird populations? What are the potential causes? Such questions stimulate reflection and contribute to a fruitful learning atmosphere in the classroom.

Nordic cooperation
The Garden Birdwatch is carried out in the last weekend in January in all the four Nordic partner countries. The reporting process is handled slightly differently in the different countries. Norway and Denmark have a fairly similar database solution, where all the reports become publicly available on the web immediately after upload. In Sweden and Finland the reports are not instantly available on the web, but here they produce a report on the contributed bird observations at the end of the campaign period. Norway is so far the only one to export the observation data directly to the national biodiversity inventory archive (Species Maps section of the Norwegian Biodiversity Information Centre, http://artskart.artsdatabanken.no). The advantage of this is that the dataset becomes available for a range of research and management institutions and can be viewed together with similar species observations from different sources.

Results
The massive participation in this campaign provides an abundance of observations and interesting patterns emerge from the dataset. As previously mentioned, it is important to document variations between the years. By relating the dataset to climatic conditions, food availability and other ecological constraints, existing patterns may be revealed. This potential will be reinforced as the time series becomes longer. In the future, the Garden Birdwatch will be one of the most important sources for documenting fluctuations in over-wintering bird populations.
Beagle: a Pan-European school project on seasonal changes in trees

BEAGLE - “Biodiversity Education and Awareness to Grow a Living Environment” was a EU Comenius project with a consortium of partners from United Kingdom, Poland, Germany, Hungary, Slovakia and Norway. The aim of the project was to improve the quality of learning outside the classroom, to enhance students’ motivation to learn, and to help young people to reach a better understanding of sustainable management of natural resources. The collaboration was initiated in 2009, the year of the Darwin anniversary, and the project ran throughout 2010, the United Nations’ International Year of Biodiversity.

We wanted to develop a Pan-European resource for schools, anchored in a website that could work as a hub for the schools’ investigations. On the website, schools should find guides on how to carry out the project and how to upload and share their results. Further, we wanted to formulate the project in such a way to encourage pupils to examine characteristics of their local natural surroundings first hand. We considered it important that pupils would carry out real tasks in their local surroundings and not exercises with a known result. We tried to formulate activities in a way that would make the pupils’ findings useful, and we designed the methods in such way that the quality of conclusions would increase with the accumulation of data. The focus was thus not restricted to the process of investigation but also included the documentation and sharing of findings. Prior experience has taught us that taking pupils’ results seriously feeds positively back to their motivation and strengthens their sense of ownership of the project.

A wider aim was that this school project might cultivate pupils’ skills and motivation to engage actively in local democratic processes concerning sustainable management of natural resources. We decided to target two key communities of users: European teachers and pupils between the ages of 10-15 years old.

After an initial discussion, we decided to focus the project on trees. Trees are quite suitable objects for out-of-classroom learning. They do not move around, they can often be found close to the school, and they provide many important ecosystem services: they produce oxygen, prevent erosion, and serve as hosts for a large amount of organisms. Trees may also be used as indicators of environmental health and ecosystem state, and are good models for demonstrating important concepts like for instance ecological niches. In our view a school project focused on trees should work as a good way to approach important sustainability issues, like for instance management of natural resources and mapping/monitoring of biodiversity. Using trees as a focus for learning provides many opportunities to meet curricular demands both in natural and social sciences.

Acknowledging that the study of seasonal variation, or phenology, is a good way to approach the problem of climate change (“Does the spring arrive earlier this year than previous years?”), we decided to make seasonal variations in trees the focus of the school project. As the project was Pan-European, we chose six tree species that have a wide distribution in Europe (Figure 1), and decided to ask the schools to investigate and report via the website the dates of onset of six phenophases: budburst, first flowering, first leaves unfolding, first ripe seeds/berries, first leaves being shed, and when all leaves had turned brown or yellow.

We developed the website beagleproject.org to host the school project. Here we offer teacher guides, identification keys for trees (Figure 2), photo guides, supporting activities on biodiversity and the role of trees, and more. The website is available in all six partner languages (English, German, Polish, Hungarian, Slovakian and Norwegian). Teachers sign up and request login access for their school on the website and they use this to post results (registration of trees with map coordinates, dates of phenophase onset, photos and more). Teachers may also generate pupil login codes so that pupils individually can enter their findings. The website makes use of a database that receives and automatically publishes uploaded data in a results section. The results section has various views that allow the schools and the general public to compare and reflect on the reported findings and to see when different seasonal stages of the tree cycles occur across Europe. These include graphical representations of phenophase dates, animated maps, and an extensive photo gallery, currently exhibiting more than 4,000 photos uploaded by schools.

Even though one might not be able to confirm or reject the thesis of climate change from the data uploaded (very long time series would be required for this), we think that
Innovation and Education for Sustainable Development

Case studies and projects

trees and 2310 phenophase dates have been registered on the website. Schools from any European country are most welcome to sign up, participation is free and the website will be running for at least until 2015. If non-partner countries wish to translate the beagleproject.org website into their own languages, this can be arranged.

www.beagleproject.org

This is a stepping stone for pupils to understand sustainable development issues like climate change and sustainable management of biodiversity. When studying the results section of the website, it is evident that the earliest spring phenophase transitions (e.g. bud burst and first flowers of Horse Chestnut) is found in Central-East Europe. Next in line are the more western parts of Europe (United Kingdom) and a couple of weeks later the same transitions are observed further north in Scandinavia and the Baltic region. While already quite good, the data set will improve further as more results are collected over the coming years. In the course of the project we have collaborated with researchers who have commented on the uploaded results, both on a national and European scale. All findings of the schools are available on beagleproject.org.

We carried out a survey among teachers who participated in the project and the feedback was good. 84% of 120 respondents reported that participation in the BEAGLE project improved their skills and interest in delivering out of classroom learning. Further, 78% responded that they improved their understanding of sustainability, and 80% improved their understanding of climate change. 84% responded that the BEAGLE website was user-friendly, had a clear structure and all necessary information to involve students, and finally 98% of the teachers expressed their interest to continue observations and involving new students into the project activities.

Although beagleproject.org is developed as a stand-alone school resource, each of the BEAGLE partner organisations carried out teacher trainings on tree phenology.

The project for developing beagleproject.org has ended, but the website is still operational and open for sign-ups. Currently (March 2011), 446 schools with 884 classes from 18 countries have signed up for the project, and so far a total of 993

Fig. 2 Key to the six tree species with details on species-specific traits relevant for identification and determination of the phenophase. © beagleproject.org
Environmental activities as a way to develop children’s commitment

“You’re wasting energy!”
Presenting the big picture of a sustainable society in terms of a preschool child’s everyday life is a huge challenge. Ekebyhovs Preschool on the outskirts of Stockholm has been tackling the energy issue for months. The knowledge has reached the children, together with a sense that their actions make a difference.

Children with hope for the future
Ekebyhovs Preschool is one of around 2,000 preschools and schools in Sweden working with the Green Flag Award Scheme (International Eco-schools). The aim of all Green Flag activities is to give children the optimism and competence to work towards long-term sustainable development. As important as the dissemination of knowledge, equally important is to get children participating in the goals so that children and educators can work together towards the sustainable development of day-to-day operations. Preschools and schools alike establish an environmental council comprising representatives from both staff and children/students. Together, they set goals for running the business in a sustainable fashion, goals that everyone contributes to achieving.

Competent educators make competent children
For several years, Keep Sweden Tidy has provided teaching materials and training to educators, enhancing their knowledge of sustainable development and teaching them how to integrate that knowledge into both educational and business operations. Since 2009, we have trained teachers from 600 Swedish schools and preschools as part of the project Communicating Environmental Action to Children and Youth (COM-U), co-financed by LIFE+. Many of them have gone on to use the Green Flag Award scheme to help establish and structure their sustainability projects. We can follow their progress via regular reports that are submitted for review in order to retain the Green Flag certification. Here we can see how teachers manage to inspire even the youngest children and capture their willingness to learn and participate.

Spreading the word
An important part of the Green Flag programme is the reporting of results, both internally and to the wider community. Every school and preschool must have a plan on how to present their work to, for instance, parents and other staff. A politician from the local municipality will also be chosen to receive outreach reports regarding the activities undertaken. Via COM-U, schools and preschools also have the opportunity to exchange their experiences at networking meetings, where educators can share their ideas and thoughts. Children also play an important role in the dissemination of information. Teachers have regular progress meetings with parents regarding activities, but it is the children who spread the change. By reflecting on what they have learned, or by being given responsibility for routine tasks such as turning off lights in empty rooms, knowledge spreads beyond the educational establishments. Occasionally, the information can reach even further. This happened when Ekebyhovs Preschool conducted an electricity-free day, an experiment, which subsequently won the praise of teachers and parents at other preschools. On that day, all lights were turned off, the dishwasher was turned off, the children helped cook food outdoors and all staff had to boil their coffee on a camp stove. The electricity-free day was a great success and it is a good example of how children can get involved in the goals of the establishment while simultaneously learning that they can affect something as abstract as energy consumption. Thanks to this active outreach, results often feature in local media too. This spreads the word about working towards sustainable development far beyond the four walls of the individual establishment and everyone involved can see that what they do is important not only for the future, but for the community here and now.
The European educational project AIRE (Adapting and Installing an international vocational training for Renewable Energy) aims to develop European standards for vocational training on Renewable Energy. These standards refer to knowledge, skills and competences that the candidates dispose of after their training.

Friedrich-List-Schule, for example, chose the VET\(^1\) programme for electricians as a basis and the transnational project partners defined special areas, such as wind, PV\(^2\), solar thermal energy, safety, processes and customer services. Technical English was considered an added communication skill. Also, entrepreneurship and business were included in the setup of the AIRE certification. The AIRE concept is meant to be applicable in different countries even if the training schemes vary considerably.

The city of Berlin is the lead partner in the project. Other partners are from Spain (Navarra), Denmark (Randers), Belgium (Antwerp) and Turkey (Izmir). In order to extend the network, partners started a Leonardo da Vinci mobility project, “AIRE plus”, which gives the opportunity to trainers, teachers and stakeholders involved in training for renewable energy and energy management to visit potential partners, lighthouse projects for renewable energy, and energy management and educational institutions in many other European countries. The AIRE project started in October 2009 and will finish in September 2011 with a final meeting in Berlin.

Many results have been accomplished so far. For example, a concept for the European AIRE certification and a draft for AIRE learning outcomes were developed. The certificate will look like a report card and will indicate:

- The EQF\(^3\) level of the candidate
- The respective NQF\(^4\) level in the candidate’s home country
- The accredited training providers, which confirm that the candidate has met the requirements of the learning outcomes as defined in the “Module” catalogue
- The legal basis for this certification and the signature and stamp of the VET provider who issues the basic certificate
- The signature and stamp of a superior body
- The signature and stamp of an internationally recognised body, which is responsible for the accreditation of training providers and the quality assurance of the AIRE setup

For the student, this AIRE certificate can be used like a dossier. Additional certificates and documents can easily be incorporated and/or collected together with the AIRE certificate. In such way, there will be a standardised method of making qualifications transparent for both the labour market and further training institutions.

For the training providers, the AIRE concept suggests certain lines of training, which may not have been covered at the school or company before. It involves quality improvement for the training provider, additional new courses, cooperation with other training providers, and recognition of certificates which are delivered by other institutions. These other training providers can be AIRE partners who train the same type of profession, or institutions, which offer specialised courses, such as safety and rescue courses for wind turbines. As a result institutions, which are familiar with the AIRE system can easily combine trainings on a European level.

Learning outcomes necessary for the AIRE certification differ according to EQF levels. At present they are available in English. Everybody can look up what the minimum requirements are in a catalogue. Of course, this catalogue does not imply that the candidate cannot have any other qualifications. It only reflects what the AIRE partners guarantee. For the quality assurance, AIRE has contacted institutions like Zentralstelle für die Weiterbildung im Handwerk, Spain’s Ministry of Education, Science and Sport, the Spanish Technology Institute, and the University of Antwerp in Belgium.
work (Central Agency for Continuing Vocational Education and Training in the Skilled Crafts) and Deutsche Gesellschaft für Sonnenenergie (German Association for Solar Energy). Hopefully one of them will sign a contract soon and thus support the project. The European Committee for Standardization (CEN-CENELEC) has shown interest in contributing to defining AIRE as a European norm or standard.

In order to put the AIRE concept into action and to build up mutual trust among the AIRE partners on the quality of training outcomes, the Berlin partner school OSZ TIEM® sent students to the AIRE partners for a work placement. This allowed partners to get a very direct impression of the quality of the training provided. In an official event, the youngsters received their Eurovosmobility documents. The European programme LEONARDO DA VINCI funded these placements.

The project also included the development of suggestions on suitable teaching material and workshop equipment for students. To this aim, AIRE took advice from experts and relevant institutions. Even though companies offer equipment or product information, they tend to be very reserved when it comes to sharing technical secrets with the students. In the long run, there will also be solutions for digital learning material. The AIRE “module” catalogue of learning outcomes serves as a basis for the development of adequate learning units.

The partners in Berlin and Navarra already had specialised training for renewable energy before the start of the project and thus already have “AIRE classes”. Nevertheless, both have started to make adaptations in order to fit within the agreed standards, either stressing English classes more than in the past or focusing on new contents. Thanks to the partner school in Navarra, AIRE had an impact on Spanish legislation for VET for renewable energies. In October 2010, TRADIUM, the Danish partner in Randers, started its first AIRE classes. The Danish system foresees more company-based training phases, but even though the training is very specific, it can still fulfil the AIRE standards.

AIRE project partners are very keen on enlarging the network of users and gaining recognition at an expert level. The LEONARDO DA VINCI transfer of innovation project AIRE is partner project of “Sustainable Energy Europe”, organised by the European Commission, DG MOVE. It was also officially accepted by the UNESCO as a project of the “UN decade of Education for Sustainable Development 2005 – 2014”. During the “European Sustainable Energy Week 2011” AIRE was presented at the Berlin office in Brussels. The final AIRE meeting will take place in Berlin on 22 September 2011.

Innovation and Education for Sustainable Development

German-Russian experience exchange in Kaliningrad

Generally speaking, kindergartens in the Russian city of Kaliningrad are not named, but numbered. This is a very different approach to that of the forest kindergarten of Lennebergwald near Mainz, where the children of the forest kindergarten “Die Bämlinge” play in the woods from Monday to Friday. In this way they learn how to interact with nature and about the changing seasons.

The concept of the Mainz forest kindergarten and other environmental education issues for preschool and schoolchildren were discussed in a number of German-Russian experience exchanges which were organised in cooperation with the German Environment Ministry, the Kaliningrad Education Ministry and the Children’s Centre for Environmental Education and Tourism in Kaliningrad. So far, two environmental education seminars have taken place in Kaliningrad since 2008, and more are planned. These seminars are being held in the context of the UN decade for sustainable education.

At the heart of the exchange is the question of how to explain to children that environmental protection is a responsibility extending beyond national boundaries. The concept of forest kindergartens particularly highlights contact with nature as a fundamental aspect of education. The children’s interaction with nature and the changing seasons is observed, providing impetus for further work with each child. Such an approach is foreign to the Russian partners, as is the idea of male educators working in kindergartens. The term environmental education in Russia primarily relates to communicating ecological knowledge, and contains a highly moral aspect in the sense of an environment-oriented “instruction”.

The aim of the exchange is to promote environmental awareness in kindergarten and school children through hands-on examples and projects. Tree planting, joint excursions to the Curonian Spit and BMU educational materials in Russian provided the Russian partners with a practical basis for addressing the issue of environmental education.

The networking of German and Russian experts has led to numerous contributions. The Russian partners plan to set up a regional committee on “education for sustainable development” in Kaliningrad in order to fulfill the need for regional networking among the environmental players. In Rybatschij a “green school” will be established. Another initiative is currently underway which is also being supported by the German Federal Foundation for the Environment (DBU). This initiative originated in the environmental education seminars. The DBU project “Lernlandschaften für Nachhaltigkeit” (learning landscapes for sustainability), brings together schools and other educational organisations in the Kaliningrad region with partners from northern Lower Saxony. The participants discuss sustainability education in practical forestry, exchange ideas on sustainable meals in schools, and familiarise Russian teachers with ecological field studies and nature camps as environmental education instruments. The German project partners will be able to bring a range of useful ideas from Kaliningrad with regard to sustainable school meals, which enjoy a higher level of acceptance in Russia.

From the results so far, it can be concluded that the environmental education exchange between Germany and Russia holds a great deal of potential for further interesting and innovative activities in which both parties can learn from each other.

Environmental education for kindergarten and school children in Kaliningrad

The aim of the exchange is to promote environmental awareness in kindergarten and school children through hands-on examples and projects. Tree planting, joint excursions to the Curonian Spit and BMU educational materials in Russian provided the Russian partners with a practical basis for addressing the issue of environmental education.

The networking of German and Russian experts has led to numerous contributions. The Russian partners plan to set up a regional committee on “education for sustainable development” in Kaliningrad in order to fulfill the need for regional networking among the environmental players. In Rybatschij a “green school” will be established. Another initiative is currently underway which is also being supported by the German Federal Foundation for the Environment (DBU). This initiative originated in the environmental education seminars. The DBU project “Lernlandschaften für Nachhaltigkeit” (learning landscapes for sustainability), brings together schools and other educational organisations in the Kaliningrad region with partners from northern Lower Saxony. The participants discuss sustainability education in practical forestry, exchange ideas on sustainable meals in schools, and familiarise Russian teachers with ecological field studies and nature camps as environmental education instruments. The German project partners will be able to bring a range of useful ideas from Kaliningrad with regard to sustainable school meals, which enjoy a higher level of acceptance in Russia.

From the results so far, it can be concluded that the environmental education exchange between Germany and Russia holds a great deal of potential for further interesting and innovative activities in which both parties can learn from each other.

The concept of the Mainz forest kindergarten and other environmental education issues for preschool and schoolchildren were discussed in a number of German-Russian experience exchanges which were organised in cooperation with the German Environment Ministry, the Kaliningrad Education Ministry and the Children’s Centre for Environmental Education and Tourism in Kaliningrad. So far, two environmental education seminars have taken place in Kaliningrad since 2008, and more are planned. These seminars are being held in the context of the UN decade for sustainable education.

At the heart of the exchange is the question of how to explain to children that environmental protection is a responsibility extending beyond national boundaries. The concept of forest kindergartens particularly highlights contact with nature as a fundamental aspect of education. The children’s interaction with nature and the changing seasons is observed, providing impetus for further work with each child. Such an approach is foreign to the Russian partners, as is the idea of male educators working in kindergartens. The term environmental education in Russia primarily relates to communicating ecological knowledge, and contains a highly moral aspect in the sense of an environment-oriented “instruction”.

The aim of the exchange is to promote environmental awareness in kindergarten and school children through hands-on examples and projects. Tree planting, joint excursions to the Curonian Spit and BMU educational materials in Russian provided the Russian partners with a practical basis for addressing the issue of environmental education.

The networking of German and Russian experts has led to numerous contributions. The Russian partners plan to set up a regional committee on “education for sustainable development” in Kaliningrad in order to fulfill the need for regional networking among the environmental players. In Rybatschij a “green school” will be established. Another initiative is currently underway which is also being supported by the German Federal Foundation for the Environment (DBU). This initiative originated in the environmental education seminars. The DBU project “Lernlandschaften für Nachhaltigkeit” (learning landscapes for sustainability), brings together schools and other educational organisations in the Kaliningrad region with partners from northern Lower Saxony. The participants discuss sustainability education in practical forestry, exchange ideas on sustainable meals in schools, and familiarise Russian teachers with ecological field studies and nature camps as environmental education instruments. The German project partners will be able to bring a range of useful ideas from Kaliningrad with regard to sustainable school meals, which enjoy a higher level of acceptance in Russia.

From the results so far, it can be concluded that the environmental education exchange between Germany and Russia holds a great deal of potential for further interesting and innovative activities in which both parties can learn from each other.

The concept of the Mainz forest kindergarten and other environmental education issues for preschool and schoolchildren were discussed in a number of German-Russian experience exchanges which were organised in cooperation with the German Environment Ministry, the Kaliningrad Education Ministry and the Children’s Centre for Environmental Education and Tourism in Kaliningrad. So far, two environmental education seminars have taken place in Kaliningrad since 2008, and more are planned. These seminars are being held in the context of the UN decade for sustainable education.

At the heart of the exchange is the question of how to explain to children that environmental protection is a responsibility extending beyond national boundaries. The concept of forest kindergartens particularly highlights contact with nature as a fundamental aspect of education. The children’s interaction with nature and the changing seasons is observed, providing impetus for further work with each child. Such an approach is foreign to the Russian partners, as is the idea of male educators working in kindergartens. The term environmental education in Russia primarily relates to communicating ecological knowledge, and contains a highly moral aspect in the sense of an environment-oriented “instruction”.

The aim of the exchange is to promote environmental awareness in kindergarten and school children through hands-on examples and projects. Tree planting, joint excursions to the Curonian Spit and BMU educational materials in Russian provided the Russian partners with a practical basis for addressing the issue of environmental education.

The networking of German and Russian experts has led to numerous contributions. The Russian partners plan to set up a regional committee on “education for sustainable development” in Kaliningrad in order to fulfill the need for regional networking among the environmental players. In Rybatschij a “green school” will be established. Another initiative is currently underway which is also being supported by the German Federal Foundation for the Environment (DBU). This initiative originated in the environmental education seminars. The DBU project “Lernlandschaften für Nachhaltigkeit” (learning landscapes for sustainability), brings together schools and other educational organisations in the Kaliningrad region with partners from northern Lower Saxony. The participants discuss sustainability education in practical forestry, exchange ideas on sustainable meals in schools, and familiarise Russian teachers with ecological field studies and nature camps as environmental education instruments. The German project partners will be able to bring a range of useful ideas from Kaliningrad with regard to sustainable school meals, which enjoy a higher level of acceptance in Russia.
Spatial planning for education

Education is a core part of the concept of sustainable development as it is a key element of its social dimension. Education is also an important subject for spatial planning at different spatial scales: European, pan-European, national, regional and local.

European and Baltic Sea Region perspective

Recently, education has gained importance in European spatial planning. This is mainly due to the fact that territorial cohesion became one of the key objectives of the EU Cohesion Policy (Zaucha 2011). Territorial cohesion would be impossible without a fair access to services of general interest. Such services are defined as “market and non-market services which public authorities class as being of general interest and subject to specific public service obligations” (CEC 2001). Services of general interest include electronic communications, postal services, electricity, gas, water, transport, labour market services, education, health care, child care, social care, culture and (social) housing. Education is part of these services and access to education is considered an important indicator of the degree of territorial cohesion. The updated Territorial Agenda of the European Union 2020 states that “accessibility of services of general interest, information, knowledge, and mobility are essential for territorial cohesion” (Hungarian Ministry for National Development, Váti Nonprofit 2011). Also article 16 of the EC Treaty confirms that services of general interest are shared values of the Union and promote social and territorial cohesion (CEC 2004).

The EU policy aims at “ensuring the provision of [...] services of general interest to all citizens and enterprises in the European Union” (CEC 2004). As underlined in the White Paper on Services of General Interest “citizens and businesses rightly expect to have access to affordable high-quality services of general interest throughout the European Union. For the citizens of the European Union this access is an essential component of European citizenship and necessary in order to allow them to fully enjoy their fundamental rights. For enterprises, the availability of high-quality services of general interest is an indispensable prerequisite for a competitive business environment.” (CEC 2004).

Spatial planning is responsible for developing a territorial approach towards services of general interest. The Green Paper on Territorial Cohesion (CEC 2008) states that “access to services of general economic interest such as health care or education is often a problem in rural areas, where for example in remote regions, [...] 43% of citizens live more than an hour drive from a university.” Therefore the Territorial Agenda of the European Union 2020 affirmed that “accessibility standards to services of the general interest should be set” (Hungarian Ministry for National Development, Váti Nonprofit 2011). For a long time VASAB raised the issue of education accessibility in space. In the VASAB Long Term Perspective (LTP) education is explicitly mentioned as part of “action agenda no. 5” concentrated on small and medium sized cities and on the enhancement of their potential. Such cities should become “important centres of innovations and specialised services, such as higher education [...]” (VASAB 2009). One of the preconditions for this is the high quality of education services. The LTP background document shows a map (Fig.1) with BSR deficits in access to higher education (VASAB 2009a). The implementation of policies regarding both spatial planning and services of general interest is generally part of EU Member States’
responsibility. Therefore, it is worth noting that the attention given to such services under spatial planning systems differs among countries. Poland is implementing the EU and VASAB approach.

**Polish perspective**

The recently elaborated Polish Spatial Development Concept (Zaucha 2010) pays a lot of attention to accessibility on different spatial scales. Among these measures, education in Polish urban planning was addressed and relevant measures were proposed under goal no. 3, which is devoted to improvement of accessibility on different spatial scales. Among these measures, education is explicitly mentioned as part of public services of general interest (Fig. 2, Fig. 3). Moreover, Polish national spatial planning does not only consider access to public services of general interest but also its role in the development of networks and cooperation between urban nodes. The Ministry for Regional Development has developed a study on these questions and it seems that higher education has an immense networking potential (Fig. 4).

Nevertheless the planning and development of educational facilities, especially in urban areas, encounters many obstacles. For many decades, education in Polish urban planning used to be an issue of special attention for public authorities. In the period after the Second World War the modernistic paradigm of spatial development was introduced. Despite changing architectural trends and fashions, the idea of an optimised school network was one of the key principles for planners. As a result, the concepts of “neighbourhood units” and “school units”, invented a few decades before, were implemented in a massive scale. At the same time a regulation on distances and infrastructure associated with particular types of educational facilities was introduced. The regulation was included in the so-called building law and in spatial planning norms, which had to be followed by planners. This philosophy brought about the development of a dense network around schools and other educational facilities. Many of them were of uniform architecture, which was partly the effect of rigid design standards and so-called “repeatable” projects. The change the political and economic systems in 1989 affected the construction frequently takes many years. It is generally perceived that children should be transported to existing facilities by buses, instead of developing new facilities in developing areas. Therefore it seems that the implementation of the EU approach to services of general interest will require a nation-wide debate about relevant planning standards for different types of space, the responsibilities of different levels of public authorities, and territory specific measures for ensuring an adequate provision of public services of general interest to all citizens. This in turn will enhance the sustainable development of the EU.

**Spatial accessibility to service centres**

Assessment of the spatial accessibility to service centres measured in travelling time.

- **Thresholds define satisfactory and unsatisfactory accessibility to service centres of different ranking (regional capitals, sub-regional cities, other county capitals).**
- **W:** regional capitals (40 minutes threshold)
- **G:** sub-regional cities, including former regional capitals (60 minutes threshold)
- **P:** other county capitals (80 minutes threshold)

Isochrones of travelling to Warsaw:

- Radii of functional market areas of regional capitals

**Fig. 2 © Polish Ministry of Regional Development**

**Isochrones of car travelling to county capitals**

**Fig. 3 © Polish Ministry of Regional Development**
Competences needed for eco-innovations: lessons learned from the SPIN project

The EU project SPIN (Sustainable production through innovation in small and medium enterprises) is an INTERREG IV B project part-financed by the Baltic Sea Region Programme 2007-2013. Helping companies to operate more profitably and to reduce their environmental impacts by applying eco-innovations is the key issue of the initiative led by the German Federal Environment Agency. The project involves partners from Germany, Poland, Lithuania, Estonia, Finland, Sweden and Denmark.

SPIN uses different instruments to support matchmaking of demand and supply of eco-innovations, i.e. bringing together small and medium enterprises (SMEs) in need of new technologies and processes (elicited e.g. by EU directives related to environment) with suppliers of sustainable innovative solutions. Good practice examples and products for sustainable production are collected in the SPIN database and matched to the demand side in industry-specific SME workshops. In addition to bringing together businesses, these matchmaking events allow deeper insights into why companies are sometimes reluctant to introduce environmentally sound techniques. During a SPIN workshop entitled "commercial refrigeration with natural refrigerants", companies from Sweden, Denmark and Germany presented their refrigeration equipment for supermarket applications: instead of using hydrofluorocarbons (HFCs), they use natural refrigerants such as propane, ammonia or CO2. HFCs are very potent greenhouse gases, which contribute to climate change when applied as a refrigerant. This is due to the high leakage rate of refrigeration appliances of approximately 15% per year in Europe. For example, the standard refrigerant in supermarket applications is an HFC blend termed R 404A, exhibiting a global warming potential (GWP) of 3784 CO2-eq, i.e. it exhibits 3784 times the greenhouse effect of the same amount of CO2 (GWP=1). Hence, a given charge of 200 kg of R404A refrigerant would result in the loss of 30 kg annually, corresponding to the emission of 113 tons of CO2. This example demonstrates that switching from HFC to natural refrigerants with negligible warming potentials means a big step forward for the environment. Although it is clear that action should be taken and a big debate about refrigerant handling and leakage is going on in the European refrigeration sector, there is only little progress in the application of natural refrigerants in Germany, even though these applications are more energy efficient and have lower operating costs than HFC equipment.

One major reason for that lies in the lack of knowledge and training of refrigeration craftsmen, who install and maintain refrigeration facilities. Most of them were trained when chlorofluorocarbons (CFCs), similar to HFCs in their characteristics, were largely used and natural refrigerants hardly played a role. Today, despite environment friendly alternatives, which have also proven to be more energy efficient, craftsmen stick to what they have been working with for decades. Since it is them who choose the equipment for their customers who are in most cases not familiar with refrigeration issues, it is not expected that the situation will change easily. A solution to the problem might be that craftsmen associations begin training their members on new, environmentally friendly techniques, in addition to imparting more knowledge on natural refrigerants during apprenticeship. This may be supported by taxation of HFC refrigerants according to their warming potential – a measure already taken in Denmark. The example given here demonstrates that not only the availability of eco-innovations, but also the know-how of how to apply them is needed for their introduction and market penetration.

SPIN has analyzed the needs of SMEs supplying or applying innovations for sustainable production. The anal-
About the significance of local knowledge, education and innovation in agriculture for sustainable development

Fertile soils are one of the most valuable non-renewable resources on earth and agricultural production must contribute towards improvement or preservation of their natural status without interfering with other ecosystems. In addition, agricultural production must feed the world population of tomorrow with high quality food. Education will play a key role for the acceptance and implementation of innovative technologies such as Precision Agriculture which is a promising approach for sustainable and profitable agricultural production.

Environmentally sound food production – a balancing act

Codes of Good Agricultural Practice (GAP) represent the statutory law on management practices that can be adopted to minimise the risk of water, air and soil pollution. The implementation of national GAP codes aims at reducing the discharge of nutrients which is closely related to stocking densities in animal production, high and improper use of fertilisers, reduction of risks related to the use of plant protection products, and promotion of biodiversity. Potential nutrient point sources are, for example, linked to manure storage and high densities of animals, problems which could be solved easily by legal action. In comparison, it is much more complicated to reduce non-point nutrient losses due to small-scale variability of pedogenetic factors. The implementation of precision agriculture technologies enables a truly balanced fertiliser input at sub-field level which matches the spatial variability of soil features and which promises a significant reduction of diffuse nutrient losses. The overall implementation of GAP codes requires a transfer of agonomic know-how to the farmer and this means that education and advisory services need to be intensified.

Experiences from sectors and regions

Experiences from sectors and regions

ys showed that competences are a major issue for SMEs when applying sustainable innovations. Especially in small and micro enterprises, there are often only a few key persons or the company owner alone in charge of innovation activities. As they have to run the daily business, only very limited time is left for acquiring information on existing innovative solutions or for planning their application. SMEs particularly lack information and know-how on:

• the actual environmental impact of their own activities
• existing innovative solutions to make their production more sustainable
• the potential benefit including cost savings and better performance from introducing innovative solutions
• environmental and innovation management within their own company
• existing funding programmes and support measures for sustainable innovations

SPIN has also analyzed existing incentives and support schemes for competence building of SMEs. These include workshop series, educational programmes as well as financial support schemes to hire external innovation experts. Existing SME networks, such as sector associations, are key points to channel information and reach SMEs.

Based on the analysis of barriers and incentives, SPIN will develop recommendations for policy makers to improve framework conditions and support sustainable innovations in SMEs in the Baltic Sea Region. Knowing that SMEs contribute to 64% of the total environmental impact of industry in Europe, it is obvious that it is environmentally relevant to create incentives for sustainable innovations. This is at the same time important from an economic point of view as SMEs form the backbone of Europe’s economy, representing 99% of EU companies and contributing to a total of 54% of the value added in the EU. Matching supply and demand of eco-innovations means private profits and public benefits at the same time.

www.spin-project.eu.

Experiences from sectors and regions

Experiences from sectors and regions
Site-specific nutrient management – an innovative technology for farmers and the environment

The environmental friendliness of site-specific nutrient management (SSNM) is evident: less fertiliser is applied to areas with high vulnerability to nutrient losses. Even though only rarely experimental proof with direct measurements is available in literature (Whitley et al., 2000), evidence for the positive effects of SSNM is provided when spatial nutrient balances are established for systems with and without applying SSNM (Haneklaus and Schnug, 1998) and when residual nutrients in soils are considered (Kitchen et al., 1995).

SSNM is an information technology applied to soil use in agriculture (Haneklaus and Schnug, 2006) and the degree of complexity of truly local resource management increases significantly for instance when nutrient fluxes are considered dynamically.

From A to E – Advisory Services and Education

Agriculture was always a business in which low-educated people could find work and this aspect needs to be taken into account when implementing new technologies such as Precision Agriculture. Although such modern technologies might enable low-educated tractor drivers to carry out high-tech operations in the fields, highly accurate navigating robots might replace human resources in the future (Haneklaus et al., 2009). A socially just implementation of Precision Agriculture requires that attention be paid to the ‘local knowledge’ of farmers in order to take advantage of inherited information and data on sub-field level for individual farms. The combination with real-time transfer of scientific achievements at schools and universities is the best way to implement sustainability practices in agriculture.

Towards an alliance of local knowledge, advisory services and education

Local knowledge can be defined as knowledge deriving from personal education and experience or inheritance from former generations. In addition, local knowledge is a new term for information, which is available on a farm, either in the form of amateurish maps, field files and any other form of data storage. Making efficient use of local knowledge is a great challenge to the operation of Precision Agriculture technologies on all scales. The farmer himself becomes the biological interface between his fields, crops and hard- and software components, respectively. Thus high-profile education at schools and universities is indispensable to acceptance and implementation of innovative technologies and thus to sustainable agricultural production, for instance through a more efficient use of fertilisers.

An example is the current way of sampling and processing information, which in its simplicity is still far away from the complex system in which plant growth and environmental factors interact. In this context, a well-educated farmer might interpret complicated interactions correctly by decoding different, often diffuse information on the target variables.

The understanding of the farmer as a biological interface adds one more aspect of quality to Precision Agriculture, namely that of education. The better the education, the better the biological interface will perform in adjusting fertiliser rates to the spatially variable needs of soils and crops. Excellent education in SSNM is for example a strategy to ensure that knowledge is transferred most efficiently from the book to the fields (Holt and Sonka, 1995; Krill, 1997; Mangold, 1995). According to recent practice, decision makers either apply strategies for SSNM themselves, or transfer this task to machinery run automatically by lower educated operators. Decision-making strategies can be substantially improved if natural processes are better understood and if this knowledge is consequently transferred into algorithms. Therefore this area of expertise is a great challenge for future education and advisory systems.

In addition, new markets for external services will arise because of the sheer complexity of Precision Agriculture technologies, which comprises data collection, storage and processing, in addition to developing algorithms for variable rate applications when compared to the uniform rates used by standard machinery on big farms.

www.jki.bund.de

Silvia Haneklaus
Senior scientist, Institute for Crop and Soil Science of Julius Kühn Institute, Germany

Judith Schick
Junior scientist, Institute for Crop and Soil Science of Julius Kühn Institute, Germany
Finding today the solutions for the sustainable land use of tomorrow

The need for knowledge and new solutions
In the metropolitan region of Oslo/ Akershus, transport is the main environmental challenge. Emissions from private transport represent the majority of climate gas emissions in the region. The city of Oslo has 120,000 more workplaces than workforce in the population. This entails substantial commuting traffic from the surroundings of Akershus and other neighbouring counties. Since 1990 the region has introduced a road charge in order to get more funding for transport investments in infrastructure. The region is now in the third generation of the so-called “Oslo-packages”, where car users have to pay a toll of 3 EURO in order to travel into the capital. This package will offer an additional 56 billion NOK in the period up to 2030. Thanks to a change in national law, local authorities can use part of the generated funds for running public transport. Local authorities could thus afford more sustainable transport services. This policy has been successful as there has been a rise of 5,8% in public transport in 2010. But the transport challenges are not solved and there is still a need for more sustainable and environmentally friendly actions. The great transport challenge calls for innovative approaches and collaborative learning processes in order to come up with both suitable and sustainable solutions. The European Spatial Development Perspective (Potsdam 1999) stresses the need for reliable criteria and indicators. The recommendation 172 states that “Spatial criteria and indicators are also necessary in the development of long-term scenarios for spatial development”.

In his speech to the Committee of the Regions in February 2011 in Brussels, the President of the EESC Steering Committee Europe 2020 stressed the importance of the “collection of reliable and objective data”.

Supporting the Regional Planning Initiative on Land Use
The Eco Region project contributed to competence development and exchange of ideas and experiences. Thereby, the project helped explore the structural relationships in the region, intensifying collaboration among regional stakeholders and strengthening the sustainability dimension in spatial development. The framework was provided by the ongoing Regional Planning Initiative on Land Use. The initiative was taken by the National Department for Environment. The municipality of Oslo, the County Council of Akershus and the 22 municipalities in Akershus are participating in this planning process. The document “Planning Strategy and Planning Programme for Land-use and Transport in Oslo and Akershus” aims to increase regional competitiveness and support sustainable development. The plan shall clarify borders between land development and preservation. A strategic map on land-use shall be drawn and decided upon. The plan shall be the basis for municipal plans on land-use and for priorities on land-use and transport taken by the county council and national sector authorities. Furthermore, it shall be at the basis for binding commitments on land-use and transport development in the region.

Fast growth demand scenarios and solutions on long-term land use
The county council of Akershus is responsible for public transport, but it is also a planning authority which supports municipalities on land use issues. Both Oslo and Akershus are fast growing counties. Oslo has a rather urban land use structure, while Akershus is more characterised by urban sprawl. The intention of the Regional Planning Initiative on Land Use is to have a more centralised sustainable land use. The land use planning process between Oslo and Akershus gathered regional land use planning stakeholders, as well as financial and infrastructure authorities such as RUTER (the Oslo and Akershus joint public transport company) and the secretariat for the Oslo package (the regional toll ring funding scheme).

A slight tendency to a more centralised and sustainable location of inhabitants
The EcoRegion project analysed land-use and household structures in Akershus in the period 2000 – 2010 in relation to the growth of population, the number of houses and the number of workplaces. 1379 statistical entities were involved. The territory was classified into the central, semi-central and decentralised areas is both in 2000 and to 2009. The area experience a decrease in constructions in the semi-central parts of the county and an increase in housing construction in the least central group, quite contrary to what was wished.

The centrality of workplaces is reduced
The developments in terms of workplace locations are more problematic. Within the period 2000-2010, the least central group had a 69% growth in workplaces. The central and semi-central group had growths of 24% and 28% respectively. But the share of workplaces located in the central, semi-central and decentralised areas is both in 2000 and in 2009 respectively 46%, 28% and 26%. Akershus is divided into four sub-regions. In the western part, the growth in workplaces is 36% greater than the growth in workforce between 14 and 75 years. The volume of commuters has grown and so have the distances to be travelled. Is this a sustainable development? For the other three regions, the growth of workplaces is much lower than the growth of workforce. They are still mainly housing regions, serving other regions with workforce. Taken together, the centrality in workplaces has been a little reduced from 2000 to 2009.

The data is offered to municipal planning
Through the Eco Region project, data from 1379 statistical entities in Akershus County were collected. Through the analysis of this information, stakeholders involved in the planning process can strengthen their knowledge. Furthermore, the collected data supports the work of the planning authorities in the 22 county municipalities. The knowledge on the current situation and innovative action planning will surely contribute to tackle the challenge of transport needs in the region.

Daniel Molin
Climate advisor, Akershus County Council, Norway

Tor Bysveen
Special advisor, Akershus County Council, Norway
Introduction of environmental education into youth culture

The Lahti Region Environmental Service is in charge of environmental education in southern Finland. It is part of the municipal organisation. We offer environmental education and other environmental advice in our office in the city centre. We also visit schools, kindergartens and all kinds of events and work in extensive cooperation with partners. This article presents one of our environmental education projects.

The cities of Lahti and Hämeenlinna carried out a project in 2010 that sought to bring environmental education into youth culture. The project also aimed to promote collaboration between environmental education and art education. Young people are often seen as a target group, which is difficult to reach. It is quite challenging to find ways to get young people interested in participation or even in taking an active role in guiding their own lives. Also, the promotion of environmental objectives has been identified as challenging. Environmental education is part of the municipal youth work, but often goals of environmental education are not reached. This is not always due to a lack of knowledge, but rather to the difficulty of applying knowledge to practice and inspiring without preaching.

Our project created a model, which focused on raising environmental awareness and responsibility among young people and children in cultural activities. The model was directly applied to youth centres, since young people could easily be reached there. Lahti Region Environmental Service carried out this project with a partner in Hämeenlinna, the ARX - Culture house for children and youth. In addition, all the city’s youth workers participated in developing the project.

The aim of the project was to create tools that help the youth centres to bring environmental issues into their everyday work. To improve ecological behaviour in everyday life, an eco-guide was designed for youth centres. The model also included a few operational programmes related to sustainable consumption and tuning. The theme of sustainable consumption was chosen, because the western lifestyle and consumption rate is far from being sustainable. The topic is especially important for young people, who are constantly bombarded with a huge amount of information and advertisements through different media. The theme of tuning was chosen, because in tuning the idea of sustainable consumption is made concrete. Tuning also promotes the collaboration of environmental and art education. And the best thing is that almost everyone likes it!

The model includes an eco-guide, which is designed for workers in the youth centres. This eco-guide provides simple and easy tips on how to bring environmental issues into the everyday work of youth centres. There are, for example, tips on waste minimization, waste collection, energy saving and how to keep our environment clean and pleasant. In addition, a poster series highlighting environmental issues was included in the model. These posters are particularly targeted to young people visiting youth centres. The model also includes a few operational programmes, for example on how to organise an eco-fashion show or a movie evening centred on environmental issues. There are also tips for tuning with nice pictures and “Green drama”, which is one of the methods of environmental education. These operational programmes can be used as a package or, alternatively, only parts of the programmes can be applied.

All the materials can be found on the Internet and are available for all other actors in the field. In Lahti and Hämeenlinna regions the eco-guide and poster series are distributed to each of the youth centres.

The materials have already been put to use. The workers in youth centres will have courses on tuning, following which they can themselves teach such courses to young people. In autumn 2011, we will see an eco-fashion show of youth centres. It is good to see that ideas are finally turning into action!  

1 In this article, the word “tune” stands for “modify”, “adjust”, but also “prettify” or “recycle.”
In the first edition of the Innovation Union Performance Scoreboard (February 2011), which is a well-established and recognised tool for assessing innovation performance in EU Member States, the performance of Latvia was well below that of the EU27. In National Development Plan of Latvia, a medium-term planning document for the period from 2007 until 2013 states that although Latvia’s economy has several sectors, which have scientific and innovation potential, as well as the potential for knowledge-intensive manufacturing, their proportion in the economy is small. Insufficient transfer of technologies and lack of innovation hamper the drive towards a knowledge-based economy. Latvia lacks not only innovative enterprises but also state and private investments into research and development of science.

In Latvia, 79% of all the students studied in Riga and 37 from 49 Latvian higher educational establishments were located in Riga in 2009. Also in 2009, 588 innovative companies were located in the Riga region, of which 471 operated in the city of Riga. A large number of service providers was also concentrated in Riga.

A combination of cooperation between entrepreneurs and science institutions, flexible and sustainable business environments, innovative technologies in the field of manufacturing and service provision, and services in the sphere of logistics and tourism would contribute to the growth of Riga and make it an economically competitive metropolis in the Baltic Sea region. This is one of the main tasks of the National Development Plan of Latvia as well as of the Riga Long Term Development Strategy for the period from 2006 to 2025.

In 2008 the Riga City Council and the Latvian Ministry of Culture agreed on the letter of intent “Riga – 2014. Baltic Sea Region centre for culture and innovation” and agreed that by 2014 Riga would become the most modern and leading urban culture city in the Baltic Sea region. To this end, Riga will need to invest in culture and education as well as in infrastructure development, to guarantee the supply of cultural and educational services to a wide audience.

In 2009 creative enterprises in Riga were involved in e.g. arts, TV, radio, interactive media, visual art, audio, culture and leisure activities, entertainment, advertisement, literature and printing. Nevertheless it is necessary to further promote prosperity and modernization of such creative industries.

It must be admitted that currently Riga’s potential is not fully utilised and that more attention should be paid to the development of a knowledge-based, innovative and sustainable economy, culture and education.

**Legend**

- performing arts
- TV, radio and interactive media
- visual art
- audiovisual art
- culture conservation, spreading and education
- leisure, entertainment and other cultural actions
- advertisement
- literature, paperweight and printing

*Creative industry enterprises in Riga © Datorkarte Ltd*
Innovation and Education for Sustainable Development

References


Interviews carried out as part of an ongoing Ph.D. project (2009-2012) by Katrine Dahl Madsen, The Danish School of Education, AU.


The RCE Denmark network website: www.rce-danmark.dk


VASAB, 2009; VASAB Long-Term Perspective for the Territorial Development of the Baltic Sea Region, Vision and Strategies around the Baltic Sea, Riga.

VASAB, 2009a, Background Synthesis Document. VASAB Long-Term Perspective for the Territorial Development of the Baltic Sea Region, Vision and Strategies around the Baltic Sea, Riga.


The EcoRegion Perspectives’ series is published as part of the EcoRegion project funded by the Baltic Sea Region Programme 2007-2013.

It documents experiences and concepts which show how sustainable development in the Baltic Sea region can become a reality. Each issue focuses on a specific sustainability topic such as tourism, spatial planning, forest, transport and energy.

EcoRegion Perspectives supports relevant regional fora such as the CBSS Expert Group on Sustainable Development – Baltic 21 as well as the implementation of the EU Strategy for the Baltic Sea Region.

The different EcoRegion Perspectives’ issues are coordinated by the EcoRegion partners and reflect a wide range of stakeholders with expertise on the respective topics.