RWL Case-Study

Country: Slovenia

Name of the programme?
Nature's Classroom is the educational polygon for permaculture and ecoremediation.

Age of the children involved?
From kindergarten (2) to over 80+ (all generations).

Short Introduction
The educational polygon for self-sufficient supply in the settlement of Dole is based on the compliance with the principles of permaculture, ecoremediaton and cooperation with local and regional communities. Ecosystem approach is as a part of permaculture and ecoremediaton and together with public participation build up ecovillage. The main focus is on education all of generations about sustainability in the future.
The polygon is located in the village of Dole in the Poljčane Municipality in Slovenia and covers 1.2 ha. It is intended for the purpose of education on self-sufficient supply, from the level of preschool education to the level of lifelong learning. Many geographical contents represent part and parcel of this polygon, from planning the use of space according to relief, exposition and incline, soil characteristics, water availability, to field research on landscape components. Together with land use energy there is a crucial issue of self-sufficient supply. The focus of the educational polygon is on identifying the possibilities for using natural resources for self-sufficiency in energy, which is closely related to mathematical geography, geomorphology, climatic geography, hydrogeography, vegetation geography and soil geography.
The whole principle is based on considering limited natural resources and rational spatial use. The following plantations are shown: a meadow orchard, a forest garden, a field with mixed plants as well as a fruit and vegetable garden. There is also a field and an area of natural succession. The elements of a sustainable way of living that are shown include: a solar collector for heating water, photovoltaic modules for electrical energy, a rainwater tank, a constructed wetland for the treatment of spring water and a spring water reservoir. A living building with willows, a fence with berries, a windward shield and an element of water with plants all serve to enrich the space in terms of landscape and ecosystem. The basic aim of the entire concept of the classroom in nature is thus to develop and strengthen the capacity of individuals to recognize and understand processes that take place in nature and the environment, to form visions and alternative suggestions for solving numerous environmental problems, and to make assessments and decisions in favour of sustainable development, which are also the key principles of the education for the sustainable development strategy.
Ecoremediation (ERM), which is based on the laws of how nature operates, is used above all in protected areas (for protection) and in the areas where degradation is present (for sanitation). Ecoremediation establishes everyday practice for cleaning water, protecting soil, preventing the spreading of dust particles and erosion, accumulating sediments and improving life quality in general. The educational polygon for ecoremediation is based on innovative approaches, which enable participants to create their own experience and understanding on the basis of their own activity.

What is the frame?
The experiential educational process provides pupils with an opportunity to learn with all senses and through experience. Students reach new knowledge by themselves and they assimilate it permanently as they participate in a real environment, which is the object of their learning, and

there is no abstraction involved. Among the teaching methods we use, the prevailing ones are observation, comparison, planning, fitting into the environment, evaluation and group work. Only this kind of learning environment enables us to place the students into a concrete situation, where she or he can learn about self-sufficiency from many perspectives. Experiential learning is based on the principles of permaculture and ecoremediation, where students can delve into landscape's interrelationships and mutual dependencies in an experiential manner.

What are the goals of the programme?

The aim of the educational polygon for self-sufficient supply is to present the possibilities of an individual's self-sufficiency in view of available resources and at the same time to explore new possibilities of an economical relationship towards nature and environment in innovative ways. The educational polygon offers various knowledge contents in the field of permaculture and the natural way of living. The key objective of the education on self-sufficient supply is to connect – through experiential learning – the contents of natural sciences with those of social sciences.

The possibilities for using the ERM include the system for climate change adaptation:

- reducing groundwater pollution by nitrates, phosphates and pesticides, as well as by organic substances and ammonium compounds from livestock farms (rainfall in certain years and its distribution)
- reducing groundwater pollution by nitrates, phosphates and pesticides in areas with agricultural and horticultural production (rainfall in certain years and its distribution)
- reducing air pollution (negative impact of air pollution on vegetation may result in the accumulation of toxic substances in plants and their fruit, causing vegetation damage)
- reducing the effects of wind erosion (which has become more pronounced since the removal of hedgerows)
- reducing landslide events
- reducing the accumulation of pesticides in the soil (although these usually degrade in less than one year, some substances are durable and resist degradation)
- reducing salinisation of the soil (which may occur because of inadequate soil irrigation with unsuitable water; however, it is considered that in our climatic conditions, soil salinisation cannot develop in its acute form)
- preserving the existing natural environment (it is estimated that around 60% of the environment is natural or half natural)
- increasing landscape diversity (intensification of agricultural production has resulted in the loss of wet and dry grounds)
- retaining moisture and enriching the ground water
- acting as a supplement to existing systems for prevention of pollution (e.g., tertiary treatment in farms)
- providing comprehensive protection of nature and environment, particularly of the agricultural landscape.

What values are promoted in the programme?

On the learning polygon for self-sufficiency we teach permaculture different generations. In four years, the number of school-age children on the learning polygon and the number of others, including a large population of pensioners has been increasing. For the intergenerational transmission of knowledge permaculture is ideal because older people still consider natural principles, and younger people have an interest in using this legality in practice. The second potential group is the generation of pensioners who are still active and can be actively involved in society doing permaculture again. It is also a recognition that the content of sustainable development is compulsory in primary school, so all students have an opportunity to learn about permaculture as an approach to achieving sustainability. Here again permaculture has proven as an ideal approach for innovative practical education and a responsible attitude to natural

resources, increasing self-sufficiency and as a contribution to social responsibility. With permaculture green jobs develop, there is a possibility of supplementary activities in rural areas, and thus the possibility of self-employment. Since permaculture in Slovenia has lots of adherents, new opportunities are opening up for young people, that some have already used.

ERM brings in the additional goal of achieving wider ecosystem functions and forms, *as well as* remediation of environmental problems. Thus, ERM has the potential to eliminate long-term environmental impacts (e.g. from non-point pollution, contamination of land by heavy metals or organic pollutants etc.) and to achieve much more. ERM challenges narrow emphases upon remediation of such impacts through emphasising a set of other benefits to ecosystem form and function that can also be delivered if the remediation is thoughtfully designed. In effect, ERM methods advocate a wider set of activities that need to be considered when deciding how to manage a degraded environment, ones that enable the operation of ecosystems more wholly. There has been a particular emphasis on water and ways of reducing human impacts as well as the potential effects of hazards (e.g. floods, droughts, avalanches) through seeing space as a 'living space' and harnessing this life in a way that both sustains life *and* delivers the associated societal protection.

The use of knowledge appears nowadays in the labor market as the maximum value of each individual, which is extremely difficult to achieve in the educational process. Although modern trends in education increasingly stress the importance of innovative forms and methods of work in the classroom, teachers particularly those in Eastern and Central Europe, still opt for the classical, frontal lecture, which is based solely on the accumulation and remembering of theoretical facts (Haubrich, 2006). The problem of knowledge acquired solely on the basis of explanation is that pupils or students cannot check it and therefore soon forget the content. Many experts are therefore placing increasing emphasis on experiential learning in the educational process, providing a problem-based process of knowledge acquisition as well as sustainable knowledge.

Pupils and students have the opportunity to check theory in practice; learn to think critically about a particular phenomenon or process and additionally to imagine processes, based on their own understanding. Based on experience they can form their own view of a phenomenon and their own position, which will affect their attitude and behaviour towards that phenomenon or process in the future. Taking into account these facts, we have decided to provide the conditions for in-depth innovative education, based on useful knowledge that will also ensure the promotion of sustainable development. As a prerequisite for achieving quality in the learning process, we have set ourselves the original goal of ensuring adequate on-site infrastructure, offering a variety of tools, gadgets and equipment for field work. The establishment of the polygon was the first step in our plan to ensure appropriate conditions for the implementation of experiential learning; at the same time it is a fundamental pillar, ensuring sustainability and societal awareness.

According to feedback from users of the learning region, the concept is excellent, and this is why we will continue to create the conditions for future experiential education also in other parts of Slovenia and in the international arena. With the support of local authorities, the regional and local population and EU policy, the creation of learning regions can be one of the exits from the crisis situation. Combining knowledge, transferring of experience between generations, reviving old practices and their relationship to innovation and, above all, their own active involvement are the ways to self-change. This is the foundation of a new way of thinking and acting.

respect for nature and care for the state of our planet – ecosystem approach
equal opportunities for all people to shape their lives – possibilities for learning by doing
respect for future generations – sustainability approach
motivation for self-sufficient supply, green jobs, innovative non standard thinking, care for self and society healthy

Which competences are promoted that empower learners to shape a sustainable future?
All of the teaching and learning activities that take place at the educational polygon in Dole are pupil-oriented and they motivate learners to gain knowledge experientially. The experiential educational process provides pupils with an opportunity to learn with all senses and through experience. Pupils reach new knowledge by themselves and they assimilate it permanently as they participate in a real environment, which is the object of their learning, and there is no abstraction involved. Among the teaching methods we use, the prevailing ones are observation, comparison, planning, fitting into the environment, evaluation and group work. Only this kind of learning environment enables us to place the pupil into a concrete situation, where she or he can learn about self-sufficiency from many perspectives. Experiential learning is based on the principles of permaculture and ecoremediation, where pupils can delve into landscape's interrelationships and mutual dependencies in an experiential manner.

In relation to comparable technology, ERM is financially cheap. On the other hand, the process of its implementation raises a wide range of job opportunities. The most obvious are the direct employment opportunities created by the need to engage the workforce in the process of introducing ERM. ERM needs a wide range of labour, from workforce professionals and technicians to a less skilled labour force to perform a variety of tasks in the process of promotion and ERM planning, its construction and maintenance. Long-term ERM promotes indirect employment opportunities.
This is why ecoremediation creates the conditions for starting green economy for supplementary activities in rural areas and new jobs in both urban and rural environments. Since Slovenia is quite late in this field of work, the introduction of ecoremediation would be an important factor in strengthening the economy and in activating unemployed people, especially those with higher education; this could create added value and thereby help to strengthen prosperity in Slovenia.

Which of the specific scientific concepts does the programme relate to?
The learning polygon was analyzed according to the 4 dimensions of sustainability:
the ecosystemic dimension
the dimension of integrity
the dimension of prosperity and
the dimension of self-sufficient supply and active public involvement

Ecosystemic dimension
The emphasis in sustainable concepts is on equally balanced development of the environmental, economic and social systems, yet more attention must be paid to the environment and nature in order to achieve prosperity. Ecosystems with their ecosystemic services are essential to our survival. Neglect of ecosystems has a negative impact on our well-being, on the quality and availability of basic resources and thus on our health. Therefore, in stressing the importance of the connection of all subsystems in the region or in local communities, the ecosystemic dimension, which provides connections with other systems, should be highlighted as a priority. This dimension is therefore consistent with the ecosystemic approach, which has emerged in recent decades and may be identified as the most important dimension of sustainability plan.

Dimension of integrity
An important reason for the failure of sustainable development is the segmentation of development into economic, social, ecological, human and local development and the consequent support for each partial development separately. This approach has divided complex issues of progress into smaller problem sections, thus blurring their interrelations. This is even more controversial, since these relationships are often conflicting. The result is that we live in an era of partial developments, as governments try to add new adjectives by magic glue to the dogma of development and thus blur the view of the negative consequences of the developmental concept. Even if the adjective ‘social’ is added to the concept of development, economic growth will be

supported. Even the concept of sustainable development, whereby governments are trying to prove the feasibility of an economically efficient, ecologically sustainable, socially equitable development of the democratic foundations that is geopolitically and culturally acceptable to diversification, does not support integrity of approaches (but divides development into separate components), which has proven unsuccessful. This means that it is necessary to combine components, in particular the capital of a certain region (environmental capital, human capital, economic capital), and to develop these together, not individually. A prime example of an insufficiently holistic approach is the Natura 2000 project, under which many protected areas are stagnating because no connection was made between natural capital and social, human and economic capital.

Dimension of prosperity

Economic growth focused on the production of material goods should not have such a fatal influence on the processes in society and nature as it had in the past. Latouche believes that a de-growth society should be created. In order to achieve prosperity, we must first answer the question of what it means when the economy dominates everything else in life - in theory and practice, especially in our minds. The concept of de-growth primarily introduces a re-definition of the boundaries of economic rationality. The beginning of the de-growth-concept goes back to the early seventies, when economic growth was becoming more and more self-sufficient. The concept of de-growth was first used in 1971 by the mathematician and economist Nicholas Georgescu-Roeg in his book, *The Entropy Law and the Economic Process*. He drew on the laws of thermodynamics, which means inter alia, that the consequences of our actions are often irreversible, so we have to think long term. In economics, this means according to Meadows, a system theorist and co-author of the book *Border Growth* that the leaders should not be rewarded for short-term successes and that in politics the time between elections should be extended. Georgescu-Roeg defended the ‘minimum bioeconomic program’ aimed at preservation of energy and material stocks, leaving these intact for future basic human needs.

Dimension of self-sufficient supply and active public involvement

The activation of neglected potential, relations between and motivation of people as well as regulated legislation are all of key importance for initiating self-sufficient supply. Following the ideas of John Venna, who in 1880 invented a diagram for a graphic representation of relations among groups, this diagram can be used for self-sufficient supply.

Regions have systems of social (S), natural (N) and economic (G) capital (or subsystems, which are dead in themselves, as long as they are not connected to each other). It is important that they be connected to each other with the content that they have in common. From the cross-sectional perspective, this means that the contents of S, N and G vary from region to region, and it is not feasible to use the same approach to their relationship/connection, if their backgrounds are unknown. The connection of N, G and S is the basis for the integrated treatment and progress, in particular prosperity, of the region's self-sufficient supply. Integrated effects appear only cross-sectionally. This is why every aspect of partial development from the perspective of overall prosperity can only be valued by its secondary impact on other partial developments, which have distinct primary objectives. Self-sufficient supply, based on respect for the ecosystem, can be used, by cross-sections of subsystems, to develop many new cross-sections, which create a solid network and links between man and nature. The dimension of self-sufficient supply also means the activation of many interests, which through shared vision lead in the same direction; this differs radically from “beacon” approaches, which are externally visible, but basically unenlightened – this is a metaphor for big projects that do not bring long-term prosperity to the region but the contrary. In the book *Politik der Inwertsetzung* (2007), among 12 decisions to be made by each region on the way to sustainability, self-sufficient supply is listed as the basis for comprehensive regional development.

Which ecological problems are involved, if any, and how? (Refer to mindmaps of 9 planetary boundaries)

Pupils get to know the terrain of the educational polygon with the help of a physical feature map (the spaces between contour lines show slopes which pupils can feel by themselves while moving about the polygon). The wind rose shows the frequency of the wind directions, to which other visible signs draw attention too. The educational centre is located at the top of the hill, which gives it the greatest insulation – a fact that is important for self-sufficiency in energy. Pupils discover that the plants which are most frequently used in households and which require most nurturing are grown closer to home, while the plants which are seldom used and which are more adaptable to different weather conditions tend to be found at more remote locations. They learn that each plant species is associated with a particular function and that they are all connected to each other, which can be best seen in permaculture gardens, where plants mutually support each other (e.g. the bed of three sisters).

The starting points are as follows: the geographical and cultural landscape diversity of Slovenia and the relatively high rate of natural preservation and polycentric distribution of settlements and tourist-recreational centre define the entire territory of Slovenia as very suitable for the use of the ecoremediation methods. Owing to the increasing damage to the environment because of unregulated land use, there is a need for rapid introduction of affordable approaches that will suit the diverse relief-characteristics of Slovenia. Tradition is an important element that supports the application of ERM approaches, so we expect that the results of the scientific discourse will create a professional basis for introducing ERM in the area. Repairing environmental damage can be expensive and unreliable in comparison to preventing degradation. Therefore, we emphasize education and assign it an important role because ERM enables better understanding of nature, natural processes and observation (e.g., water purification, retention of heavy metals in the soil, noise alleviation). Information, communication and lifelong learning are also of great importance. The preventive meaning of ERM is remarkable because it includes a variety of target groups: audiences from children to seniors, various professional profiles and various governmental and non-governmental institutions. Based on the scientific discourse, we will show the current opportunities in this field and, while considering examples of good practice, we will look at the effects of the introduction of ERM in the region (the Dravinja Valley, the Poljčane Municipality, the Learning Centre for Ecoremediation).

Transferability: Which different areas of learning are included and how?

Regional development should be based on internal sources (Krotscheck, C. 2007). Slovenia has a rich natural and cultural heritage, which was included as a development capital. In line with this reasoning, the University of Maribor, Faculty of Arts, International Centre for Ecoremediation started in 2009 a project with an innovative approach to education, where we developed the methodology of an outdoor classroom in nature. We provided a theoretical basis for interdisciplinary experiential learning with an emphasis on sustainable development.

Educational institutions in Slovenia, as well as in the countries of the Balkan Peninsula have supported such an approach to classrooms in nature and the initiative was taken to the then Ministry of Education in Slovenia to prepare a tender for the establishment of conditions for experiential education for sustainable development. Thus, in Slovenia in the period between 2009 and within the project 2010, an attractive learning environment for all ages was created (Senegačnik et al., 2009).

In the Dravinja Valley in the eastern part of Slovenia, in the area of Natura 2000 predominance, and where nature is still well-preserved, real natural classrooms were established. In 2010, the Slovenian Ministry of Education and Sport supported the project of establishing educational polygons in Slovenia, with the objective of providing especially young people (without the exclusion of lifelong education) with a holistic approach in research, teaching and learning in nature.

- The Educational polygon for standing waters in Sveta Trojica,

- The Educational polygon for groundwater in Miklavž and
- The Educational environment for natural ecoremediation by the river Dragonja

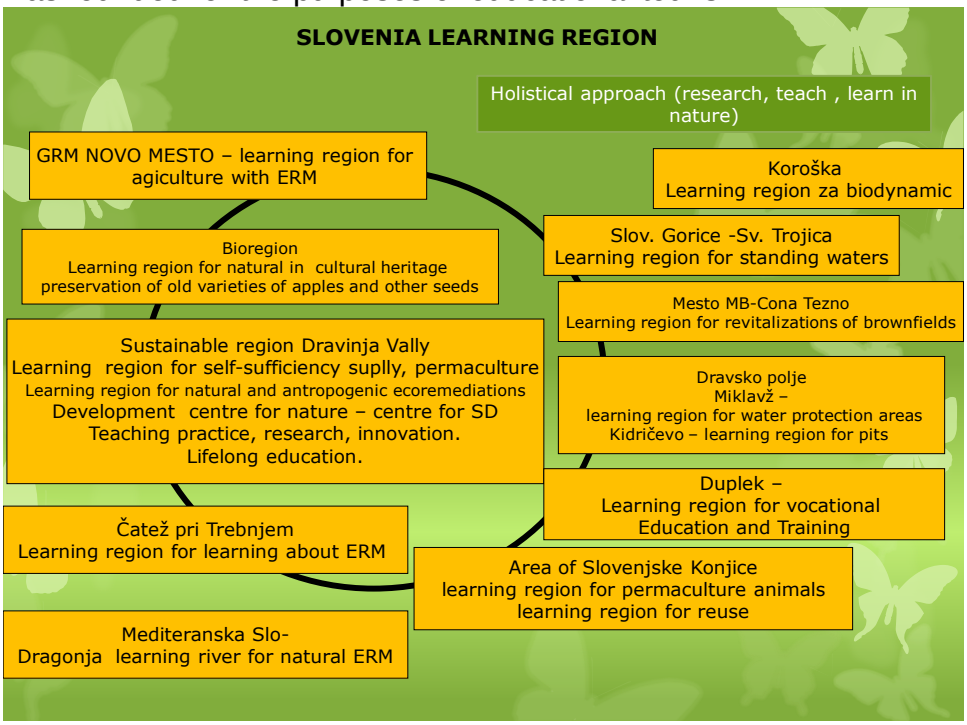
have as yet been only partially established. In addition,

- The Educational point for constructed wetlands in Dobrna,
- The Educational polygon for ecoremediation GRM Novo mesto and
- The Educational point for soil protection in Rakičan

are also under construction.

Nature's Classroom, which links the above mentioned educational points, includes several educational paths (the municipality of Poljčane alone features 13 educational paths), cycle tracks and observation points.

The majority of activities take place at the two educational polygons in the municipality of Poljčane, i.e. in the settlement Modraže, where the emphasis is placed on ecoremediation and self-sufficient supply. The municipality of Poljčane has systemically approached the transformation of the educational infrastructure into a classroom in nature, whose professional management is carried out by the International Centre for Ecoremediation at the Faculty of Arts of the University of Maribor, while the organizational work is undertaken by the Nature Development Center, which was founded for the purposes of educational tourism.



Teaching polygons as the basis for learning a region of Slovenia

What educational strategies (learning models, methods, etc.) are used in your programme?

Pupils can make plans for their own gardens with the help of the knowledge obtained at the educational polygon for self-sufficient supply. Their designs are very concrete, as they plan where they could set up their garden, how they could optimally use the energy of celestial bodies, and how they could grow their own produce and highlight the pleasant appearance of the environment. They are also able to choose the necessary equipment and they learn to identify compatible plant groupings and to plant herbs and trees. They are taught to evaluate the work they carry out, since they continuously monitor it in the light of the investment of their time and the final product. They discover by themselves that permaculture gardens do not require much work, as most of the work is carried out by nature itself, while these gardens also produce healthy food. Pupils generally experience joy when observing the fruits of their work (design sketches for a garden, or a garden patch).

There have been several examples of adapting agriculture to climate change, and on the basis of the report Adaptation to Climate Change in the Agricultural Sector 2005/2006, the following measures turned out to be the most reliable (Iglesias et al. 2007; Smith et al. 2002) :

- planting hedges and barriers and restoring forest areas
- restoring and maintaining water ditches
- creating and restoring pools and ponds
- spilling water already in the upper watersheds/river basins
- planting or preserving meadows at the edge of cultivated areas
- reducing the use of herbicides and pesticides
- increasing the number of birds in an agricultural area
- taking care to maximize the diversity of plant and animal species by using methods such as permaculture
- going over to at least partial self-sufficient supply in order to reduce emissions to the environment through transportation and
- enhancing knowledge of multiple approaches to reducing the effects of climate change (through education)

The growing number and frequency of natural disasters and the deterioration of protective land use because of unilateral intervention in the environment, dictate the need for greater use of natural cleaning systems, imitated by ecoremediation. Ecoremediation is based on the duplication of natural processes, with a focus on the enhancement of ecosystems (the ecosystemic approach), and on the cleansing of the environment (the remediation approach). While we increase the stability of ecosystems through ecoremediation and at the same time cleanse the overburdened natural elements, we also create an opportunity for new activities in the area. The bio-economy is particularly based on ecoremediation, because there is a need to preserve nature on the one hand, and an even greater need to make the natural resources available for processing, on the other.

How is the programme evaluated? How do you know the programme achieved its educational goals?

The International Centre for ecoremediation was established at the Faculty of Arts with the goal of developing new integrated knowledge relating to the economy, environment and society.
Throughout history nature has developed incredible buffer capabilities. These processes can be used because of the rapid development of knowledge we posses and which has improved our quality of life. The application of natural processes to protect the environment is called Ecoremediation, a concept that is acknowledged in Slovenia as being associated with exceptional development opportunity. Traditionally good relationships exist between West Balkan countries and consequently we wish to recognise this development potential in this part of Europe as well. We provided a theoretical basis for interdisciplinary experiential learning with an emphasis on sustainable development. Educational institutions in Slovenia, as well as in the countries of the Balkan Peninsula have supported such an approach to classrooms in nature and the initiative was taken to the then Ministry of Education in Slovenia to prepare a tender for the establishment of conditions for experiential education for sustainable development. Thus, in Slovenia in the period between 2009 and within the project 2010, an attractive learning environment for all ages was created (Senegačnik et al., 2009). In the Dravinja Valley in the eastern part of Slovenia, in the area of Natura 2000 predominance, and where nature is still well-preserved, real natural classrooms were established. In 2010, the Slovenian Ministry of Education and Sport supported the project of establishing educational polygons in Slovenia, with the objective of providing especially young people (without the exclusion of lifelong education) with a holistic approach in research, teaching and learning in nature.
In the context of professional backgrounds for the preparation of educational curricula and modules for classroom practice, field work and excursions, four curricula were prepared, namely:

- Curricula in accordance with the knowledge catalogues for compulsory and elective modules of the Environment Preservation Technician educational program;

- curricula for research, field work and learning at the established ecoremediation polygon in the fields of
    - nature preservation,
    - environmental protection and
    - environmental education,

  with cross-curricular links to mandatory general education courses, such as biology, geography and chemistry,

  as well as elective courses in subjects such as beekeeping and environmental chemistry,
- And preparation and implementation of educational curricula for natural science days and field work within primary education, focusing on
    - the environmental subjects (1. triad of the 9-year primary education),
    - natural science and technology (2. triad);
    - biology and geography (3. triad) and in particular on
    - the elective course environmental education at all stages of primary education (www.ucilnicavnaravi.si).

Describe the programme.

At the centre we do not have volunteers; we have students doing work experience, which is compulsory at some schools.
Students and pupils often visit our centre as a field day.
Many visitors come to our centre to learn skills they need at home, so an emphasis is on developing knowledge, which solves current problems dealing with water, soil and plants and also with way of life and thinking.

The following programs are prepared:

The curriculum for the implementation of the obligatory practice and practical lessons in the educational program, with a view to achieve the learning objectives and upgrading the learning content within the following modules: sustainable development, protection of natural values, ecosystems, implementation of activities in the region, ecoremediation; environmental tour guiding.

The curriculum for realization of practical lessons, research and learning at the ecoremediation learning polygon in order to promote the learning objectives in the educational programs Nature and Environment Preservation Technician and to achieve the objectives of an elective course for general and professional high schools: the environment and sustainable development.

The curriculum for the implementation of natural science days, field work to meet the objectives of environmental education in the first triad of primary education.

The curriculum for the implementation of natural science days, field work to achieve the goals of environmental education and education for sustainable development in primary schools.

We have also gathered outstanding examples of teaching materials and problem-based tasks, which have been prepared by teacher practitioners. These materials are designed to assist teachers when deciding to undertake natural science days or fieldwork within the classroom in nature, while problem-based tasks are formed in such a way that they can also be used in other learning situations or they can be transferred into the local school environment. Problem-based tasks have been prepared in the context of individual modules, i.e., the content sections within the curricula referring to knowledge objectives on two levels: basic, primary education and within the obligatory or elective professional modules of the educational program Nature and Environment Preservation Technician.

For primary education, the following problem-based tasks were prepared:

Ecosystems
Biodiversity

Habitats
Learning about the environment
Biodiversity pond
Running and standing water
Caring about the environment

During the preparation of problem-based tasks for the educational program Nature and Environment Preservation Technician, the following tasks were created, representing examples of good practice in the preparation of problem-based tasks and content selected learning units within both the obligatory and elective professional modules listed in the parentheses:

The ecological farm and sustainable development (module: sustainable evelopment) The forest learning path (module: environmental tour guiding)
Chemical analysis of water (module: ecological analysis and monitoring)
Composting (module: organic waste processing and maintenance of biological and vegetal purifying plants)
Wood biomass (module: getting wood biomass)
Designing space for a vegetal purifying plant (module: ecosystems, implementation of activities in space and ecoremediation)
Natura 2000 (module: sustainable development)
Forest decline (module: ecosystems, implementation of activities in space and ecoremediation)
Vegetal purifying plant (module: ecosystems, implementation of activities in space and ecoremediation)
Herbs in the organic farm (module: sustainable development)
Recognize soil and soil analysis (module: ecological analysis and monitoring)

Picture 1. Young people learn to protect soil through permaculutre methods.

Included resources / materials / tools.

Učni poligon
ZA SAMOOSKRBO
DOLE
(permakultura, ekovas)

MOJA RAZISKOVALNA POT št. _____

NARAVNI VIR = kaj imamo na razpolago za življenje?
Naravni vir je vse kar nam daje narava (voda, zemlja, toplota, svetloba, senca, rastline…)

SAMOOSKRBNA UREDITEV =
Postavljeni sistemi za pridelavo hrane, pridobivanje vode in za sprostitev, druženje, učenje… Z njimi koristimo naravne vire.

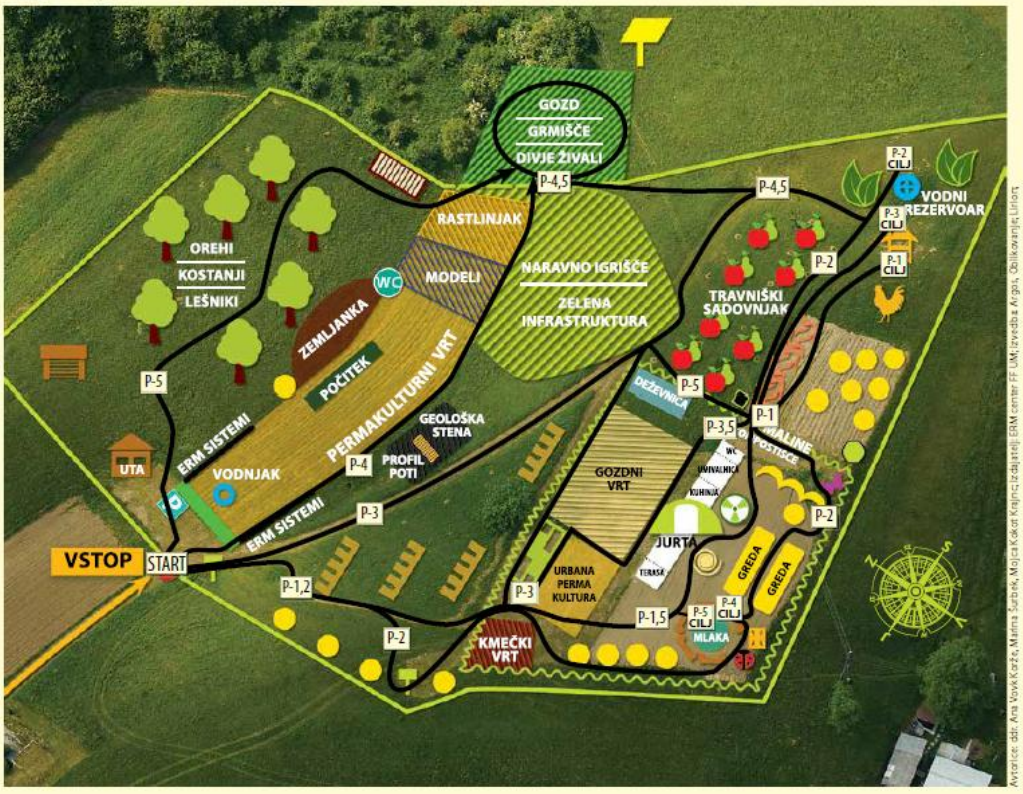
Raziskovalna pot št. =	Št. naravnih virov =	Št. samooskrbnih ureditev =	Skupaj =
Naravni viri	**Opis**	**Meritve**	**Ovrednotite razpoložljive naravne vire!**
Samooskrbne ureditve	**Opis**	**Meritve**	**Kako bi še lahko koristili naravne vire?**

Učni poligon
ZA SAMOOSKRBO
DOLE
(permakultura, ekovas)

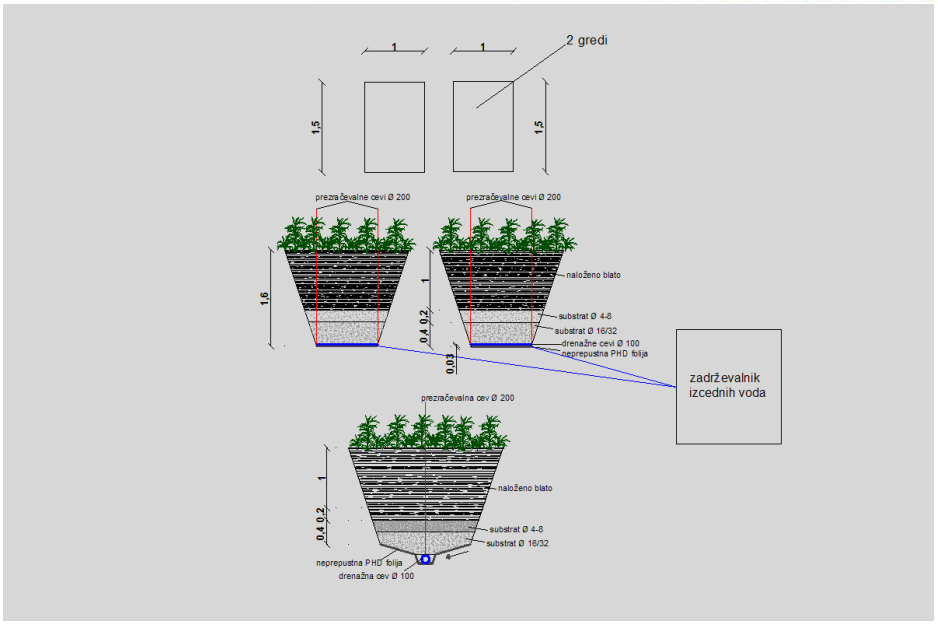
PREPOZNAJMO NARAVNE VIRE IN SAMOOSKRBNE UREDITVE - DELOVNI LIST

Raziskovalne poti P1, P2, P3, P4, P5

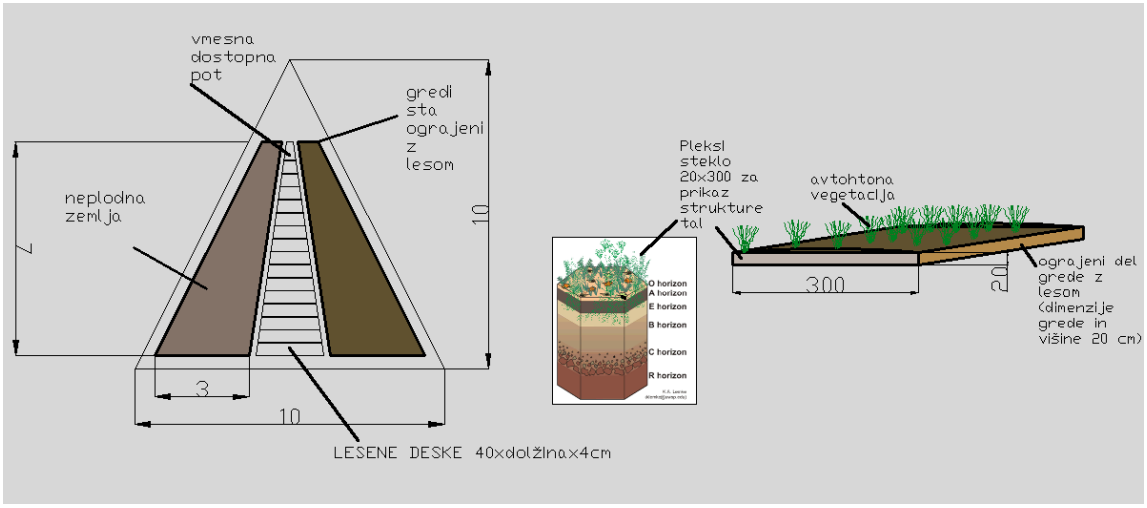
Popišite naravne vire in samooskrbne ureditve, ki jih opazite na izbrani raziskovalni poti.



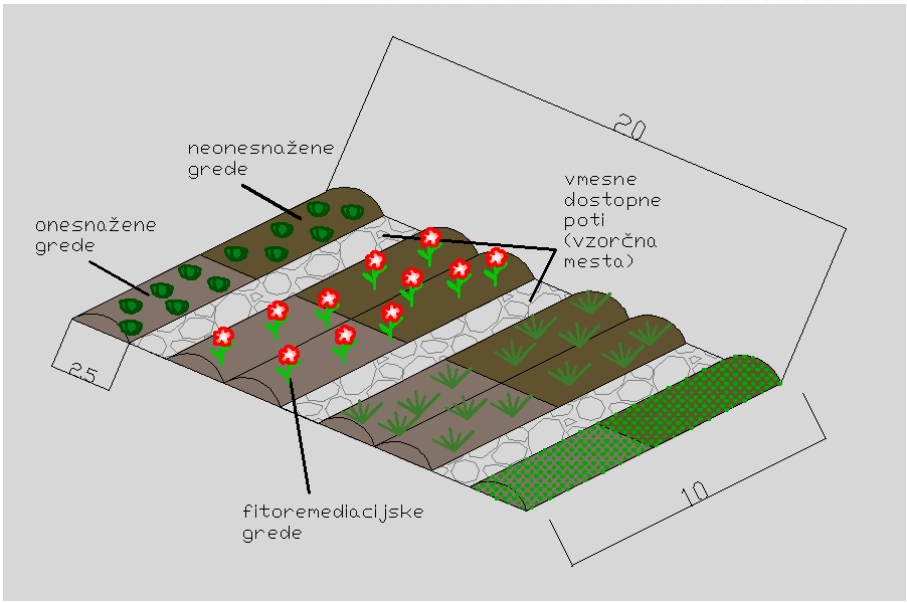
Picture 2. Research ways (P1 – P5) for self investigation of different permaculture objects and gardens.



Picture 3. The implementation plan showing the section through the bed for phytoremediation of sediment.



Picture 4. Implementation plan of phytoremediation beds between the slope and natural wetlands.



Picture 5. Planting scheme of phytoremediation beds


Picture 6. Planting *Carex sp.* on constructed wetland by students of nature conservation technician programme – ecoremediations.

Picture 7. Restavration of pond with ecoremediation methods (plants, stone, animals).

Picture 8. Prepering the “Insect Hotel” as support in natural gardening - permaculture.

Picture 9. Students prepering high beds for understanding ecosystem services.

Picture 10. Students learning how to prepere “terrase” and put plants into the soil.