AGROECOLOGY IN SLOVENIA

Ana Vovk Korže
PhD., PhD., Full Professor
University of Maribor
Department of Geography
Faculty of Arts
Koroška cesta 160, SI-2000 Maribor, Slovenia
e-mail: ana.vovk@um.si

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Abstract
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The article presents to agroecology (AE) as a sustainable approach in Slovenia. AE deals with contents as the ecology in agriculture, organic farming, sustainable agriculture, green agriculture, permaculture, ecoremediations, integrated farming and natural agriculture. According to the official definition the term AE means the use of traditional practices that are consistent with the characteristics of the local environment and do not limit only on food production, but also on food processing (recipes), products made from natural materials, especially wood, stone and construction as well as on ways of sustainable relationship to nature (water storage, attitude to water use, attitude to soil, shallow ploughing, attitudes toward animals, plants). We have discovered the concept of AE and its use in Slovenia. In Slovenia the term is limited to the understanding of the importance ecology in agriculture. The representatives of the Slovenian institutions of the Chamber of agriculture and forestry who have a similar project on the topic of AE, designed for agricultural consultants, having described different form of AE. In project Agroecology at the Faculty of Arts we develop educational moduls for teaching AE in practise.

Key words
Agroecology, agriculture, ecoremediation, organic farming, permaculture.

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1. Introduction

The term AE is thus very broad and it is understood as a responsible way of life according to the tradition of the local environment (Raman 2006; Dunphy, Spellman 2009). The approaches that are developed in Slovenia and in which we can find the content of AE, are limited to single segments of the term. Thus Organic Farming (OF) means farming according to EU guidelines, which takes into account the relationship to plants and animals, but they are not based on heritage or tradition and they do not direct natural resources in the direction of energy-saving use. OF knows irrigation and reclamation of land, ploughing, spray and protective agents. OF procedures are certified and as such generally applicable everywhere, regardless of location, tradition or the conditions of nature (Online source 2). Typical of biodynamic agriculture is to compliance with the rhythm of nature and to understand the cosmic forces and energies of the Earth, such as ethers. This is the highest level of responsible attitude to nature, but is not officially supported since it is not interesting for biodynamic agricultural markets because it does not use poisons (Online source 1; Piercea 1990). In Slovenia, permaculture is increasingly expanding and takes into account a comprehensive approach to nature, but it also has a hint of Asian elements, in particular, vertical gardening and various green systems, many of which are not suitable for Slovenian situations (green walls require a lot of water). We note that the concept of AE connects all the elements of responsible lifestyles, so we are introducing this concept as an integral for all the terms that have been used up until now in Slovenia.

2. Research work methodology

For understanding agroecology in Slovenia we analysed two projects:

2.1 The analyse of the project SAGITER
Project SAGITER-Agro-ecological knowledge and ingenuity of rural areas Data for the project SAGITER, which is the acronym for the project “Agro-ecological knowledge and ingenuity of rural areas”, we gathered from the website of the Chamber of agriculture and forestry of Slovenia (Online sources 1 and 2).

In the framework of the Leonardo da Vinci programme as a partner organization in a project with the title SAGITER the Slovenian representative is the Chamber of agriculture and forestry (KGZS). The project deals with the field of AE. This takes into account the legality of farming, according to traditional systems, adjusted to the specificities of their environment. Project SAGITER combines the ten partner institutions from seven European countries (Online source 2).

2.2 The analyse of the project “Teaching agro-ecology in the transitory period, its consequences for the agricultural knowledge Systems”
The Euro-EducATES project is an Erasmus+ project which takes place in the key action "cooperation and innovation for good practices" and in the field of "strategic partnerships for vocational education and training. Project will have five outputs: a first report makes an inventory and a comparative and critical study of the diversity of approaches of agroecology; a second report talks about innovations and changes induced by agroecology. It will be based on case studies; three educational tools (one based on written materials, one based on audiovisual techniques and one for E-learning developments).

2.3. Defining the direction of AE in Slovenia (based on the analysis of the situation)
Based on the review of diferent materials (books, articles, web pages, project materials) relating to agroecology was defined main- and subindicators that we take into account and we recognize the occurrence of AE in Slovenia (in practise, in research and in education) (Tab. 1).

Tab. 1: Main indicators and subindicators

Main Indicator	Subindicator
Social	Community
	Communication
	Education
	Transition / Transformation
	Tradition
	Political
	Social Justice (intergenerational thinking, worker rights, gender aspects, etc.)
	Values and Ethics
	Autonomy-food sovereignty
Environmental	Biodiversity
	Soil health
	Landscape (spatial dimension)
	Climate
	Climate Change
	Animal Health
	Plant Health
	Ecosystem Services (clean water, air, etc.)
	Ecoremediation
	Permaculture
Economic	Tourism
	Marketing
	Membership
	Green jobs
	E-marketing
	Autonomy (e.g.,) less inputs less costs, etc.)
Technical	Digital technology
	New tools

3. A broader understanding of the concept of agroecology in Slovenia

In the following part we present the results of the survey, which used the term AE in Slovenia. We have found that this concept can be found in education (the university degree of Faculty of agriculture and life sciences and the Faculty of ecology in Koper) and also in the field of agriculture (Chamber of agriculture and forestry of Slovenia). Although the term is not often used in recent years its use has strengthened. This can be seen by the inclusion of Slovenia in international projects with this content, which can be seen in the following part. In comparison with former republics of Yugoslavia, where the concept of AE is very often used, the term in Slovenia can be found only on some web pages (Online sources 2, 3, 4, 5).

The project connects ten partner institutions from seven European countries. Partners are three universities: University of Marburg in Germany, Cluj from Romania and the Hungarian University in the Gödölö; two Chamber of agriculture (KGZS) from Slovenia and VAL from Flanders and training centres from the Spanish province of Galicia and France: Geyzer, Fummeterre, and Nobody from the CFPPA SupAgro from Floraca, which is the lead partner. The project is carried out in the framework of the SAGITER Leonardo da Vinci, lifelong learning and aims to develop modules for the training of

AE in the area of agriculture. In the description of the project, it is stated that the purpose of the three-year project is to cooperate in a dynamic process of evaluation of the informal traditional knowledge, which have developed over time in the rural areas, and their conscience in parallel with an academic approach. This means that AE is understood with the transmission of traditional knowledge in the current practice, which is one of the directions of AE, which does not have a precise definition in Slovenia (for us this definition seems very suitable, since it is based on the capacity of the environment and is associated with the historical value of space, culture, habits and above all it is consistent with nature).

An indication that the purpose of the project is to participate in a dynamic process of evaluation of the informal traditional knowledge, which have developed over time in rural areas and their considerance in parallel with the academic approach with the effective use of natural resources and the creation of social cohesion in rural areas means that it comes to the implementation of the sustainable development or sustainable principles into practice, which is in the field of agriculture, a novelty in Slovenia, since up until now complex approaches have not appeared. Up to now, the emphasis was on the methods that work soothingly on the environment from intensive farming, but to connect all spheres of society, including tradition, is a novelty in the project SAGITER (Online sources 7, 8). In the presentation of the project it is also written that for this purpose, the partners will develop a method for training of mentors, engineers and technicians for a better recognition and integration of knowledge, which are formed by experience over time in rural areas.

The starting point of the project is to analyse the features of a traditional rural skills, options of its action and to prevent the loss of these skills. In centuries of farmer's coexistence with nature, farmers have accumulated knowledge and skills that they have been using for management. The skills and knowledge have been adjusted so that in the given conditions they are to produce as much as possible and take into account local characteristics of soil, climate, water, and coexistence with neighbours and nature. Over the centuries people have learned to observe nature and to adapt to it so that with her help they got a sufficient amount of high-quality food, feed and other products. Intensive farming pushed this knowledge to the periphery. Instead of sustainable farming profit prevailed in many parts. Nevertheless, throughout the world, there are knowledge and traditional farming approaches that give farming the characteristic of sustainable farming. This used to be a necessity, if farmers wanted to survive. Moreover, just by collecting and presenting these skills in some places, especially in South America, they enabled local communities to have once again begun to farm according to traditional systems, adapted to the specificities of their environment. The knowledge and proper valuation of traditional knowledge does not only allow their sterile maintenance, but also allows the inclusion of agro-ecological knowledge in the everyday life of rural areas and ensures sustainable farming. In doing so, institutions have an important role since they are increasingly assuming the role of mediator of skills to compensate intermittent traditional ways.

The approach is called AE and in the management of the agricultural space introduces an old traditional knowledge, which have been previously evaluated and updated by experts and are recommended to use (Online source 10). High-quality performance provides a multidisciplinary approach, enriched with a variety of partner links, such as agricultural advisors, teachers, mentors and researchers in the fields of agronomy, education, economics, anthropology and the environment.

At national level the uniform and final common definition of AE does not exist yet. Most of descriptions of AE recognized at national level are based on the environmental aspects of sustainability and underlines its importance. Hereafter report summarized some key international and national definitions, adapted to national agriculture situation.

AE is a term that can be used in several ways, as a science, as a movement and as a practice in the field of agriculture in the world. AE treats agriculture in an interdisciplinary way. Agriculture is considered as part of the ecology, therefore, AE is focused on OF principles (Online source 3).

AE in advance does not exclude any approach. It is a set of different skills, adapted for use in local environments for the most sustainable oriented farming. Approaches do not exclude a sustainable-oriented innovation or the transfer of knowledge from another environment where it appeared useful. The holders and users of this knowledge are mainly small farmers who have less and less space in the "farming for profit".

In some places in Europe, particularly in France, they have been collecting local knowledge and trying to transmit it to the young generations with the help of schools, for a long time. We are fortunate that many skills are still maintained and in some cases they still apply. AE approaches can help to evaluate this knowledge and maintain it.

AE is not associated with a particular method of production, whether it be organic, conventional, intensive or extensive. In addition, it does not define any way of management, such as the use of natural enemies instead of insecticides, or polyculture instead of a monoculture. Additionally, agroecologists do not unanimously oppose technology or inputs in agriculture, but want to assess how, when and if the technology can be used in conjunction with the natural, social and human resources. AE proposes a context or "site-specific" method of studying in agroecosystems studies and, as such, recognizes that there is no universal formula or recipe for success and the greatest prosperity of the agricultural ecosystem. Instead, agro-ecologists may study questions related to the four system properties of agroecosystems: productivity, stability, sustainability and justice. Unlike disciplines dealing only with one of certain properties, agroecologists see all four properties, which are connected to each other. Agroecologists study these four properties through an interdisciplinary approach. Using natural science agro-ecologist tries to understand the items in the ecosystems such as soil properties and plant, and that by using the methods of the social sciences they understand the effects of farming in rural areas, economic constraints to developing new methods or cultural factors determining farming practices.

The approach of Eugen Odum (1983) is based on the assumptions that natural systems with their stability and immunity are the best model for imitation. Usually the ecosystems of AE are not actively involved in social sciences, but this school is based primarily on the belief that the intensive agriculture is unappropriated.

The second approach involves the traditional agricultural production. This approach is also not actively involved in the social sciences of the AE analysis, however, it does use the social understanding of the processes by which an intensive agriculture became unsustainable. The third approach focuses on the multifunctionality of

landscapes, instead of focusing exclusively on the promotion of agriculture. Agriculture and nutrition counts as an institutional complex that relates and connects with other social institutions.

In accordance with the above definitions report summarizes them into a common working definition adapted to the national agriculture situation: AE means the use of sustainable practices based on traditional and local farmer‘s knowledge, consistent with the characteristics of the local environment and conservation of the biodiversity and cultural landscape. The management systems focuses on the whole food system, including environmental, economic, social and etnical dimension and the support of small scale farmers. AE is considered being a part of the ecology and developed ecological structure that doesn‘t need external inputs and allows the interactions among species for the system to work.

4. Agroecology in Slovenia

The Slovenian Ministry of agriculture, forestry and food carried out the common agricultural policy in the field of market orders and rural development arising from European rules, strategic and implementation documents on agriculture and the implementation of a policy of direct payments within the first pillar of the common agricultural policy and policy management of agricultural markets. Within the limits of the powers of the Ministry helps to shape the market-price and protective policies for agricultural, forest and food products (Online source 4).

Slovenia has, due to specific structural factors such as the diverse terrain, altitude and associated climatic conditions and soil type, handicapped accessibility, unfavourable age structure of the population on farms, lack of professional skills of farm holders, lack of technical assistance and information to farmers and consumers, lower profits and lack of financial stimulus (subsidies)-only ecological, supplementary farms dominate due the low farming income, abandonment of agriculture land and natural forest re-growth where the number of farms is dropping constantly difficult conditions for the development of agriculture. At the same time, Slovenia has a varied natural endowment, with different types of landscapes and lush landscaping specifications, with a large proportion of the mountain uplands of farms and other areas of less-favoured agricultural activity represent good opportunities for further and accelerated the development of naturally more friendly forms of farming. Such practices contribute significantly to the provision of public goods, the preservation of the cultural landscape, conservation or improvement of agricultural biodiversity, the protection of drinking water resources and protection of the whole environment (Online source 5).

Due the above specific conditions are the main challenges of Slovene agriculture: increase the level of agriculture productivity and help young farmers to get started, creating new jobs and fostering local development in rural areas, reduce the land abandonment and to improve the polluted ecosystems, support market organisation and short food supply chains, new ways of collaborations among small scale farmers, providing new working places for young people, increase of knowledge and innovations transfer.

During the period of Slovenia entering into the EU, Slovenia began to encourage conversion to sustainable forms of farming, for which there were EU and national financial incentives, which helped farms to replace the lost income due to the

transition. Slovenia promotes the introduction of agricultural practices, which in the long term contribute to the preservation and protection of the environment, sustainable management of non-renewable natural resources, soil fertility, preserving biodiversity and traditional rural cultural landscapes, protection of drinking water resources, adaptation to climate change and at the same time ensuring the production of high-quality and safe food (Online source 6).

Slovenia is in accordance with the objectives of the EU common agricultural policy, the national legislation and the national strategic documents supported financially and as a form of environmentally friendly agricultural practices encourages in particular, integrated production and OF. All forms of sustainable farming represent the long-term strategic course of agriculture, understood as interdependent and balanced development in the economic, social and environmental aspect, that are also emphasized in the key strategic documents and legislation of Slovenian agriculture. The national agricultural policy emphasises issues such as the: (de)population of the countryside, preservation of cultural landscapes, ecological acceptability of human activities, ecological and social factors in addition to market-oriented ones.

In this chapter we presented some other sustainable approaches, which are based on more traditional forms of farming as they are also understood in AE and take into account the circulation of substances on the farm, the crop rotation without the use of mineral fertilizers and pesticides. They are derived from the knowledge of the nature of the crops and animals. Approaches such as biodynamic farming, permaculture and ecoremediation in agriculture represent a new alternative forms of farming which have gained a big support among the general public and local farmers. Since the late 1990s, several non-profit and non-governmental Biodynamics and OF Associations of food producers and interested public were established (Demeter Certification) – Organic farming (OF) movement. However, at the national level they have not yet received financial incentives and are not legally defined as this applies to the already well-established OF. In particular, permaculture and biodynamic farming are increasingly expanding among Slovenian organic farms. Previous research indicates that farmers have a lack of knowledge about these approaches and want to learn about permaculture and other sustainable principles and their application in practice. Farmers miss more useful knowledge in the field of sustainable farming by educational institutions and associations.

4.1 Integrated production

Integrated production is one of the forms of nature-friendly way of production with the use of natural resources and mechanisms that reduce the negative environmental impacts of farming on the environment and human health, which produces high-quality and healthy food. The scheme of integrated production of the field crops, fruits, grapes and vegetables is being carried out in Slovenia and is considered to be the most widespread surveillance scheme. Harvesting technology, procedures, controls and method of labelling are written in the rules on integrated production and the technological instructions for integrated production, which is issued annually by the Ministry of agriculture, forestry and food. The ministry annually appoints control and certification organizations, which provide a continuous control of the production, and issue certificates in accordance with the regulations. Control over the operation of organisations for the control and certification is carried out by the Inspectorate of the Republic of Slovenia for the agriculture, forestry and food.

By the year 2015, integrated production is no longer a part of the Rural development programme 2014-2020. Farmers who have been or are still involved in integrated production can transit to organic production. Integrated farm must make the transition to organic processing through the conversion period that lasts at least two years, but for permanent crops it lasts at least three years before the beginning of the marketing of organic produce. In doing so, to the farm is entitled to partly cover the costs of support for controls of organic production and processing of agricultural products or food.

The certificate and the official designation of the organic, issued by an authorised control organisation offers consumers an assurance on a specific mode of production of organic crops and food under Regulations on organic production and processing of agricultural products or foodstuffs (Official Journal of the Republic of Slovenia, no. 31/01.).

4.2 Organic farming

At the national level OF was recognised as an opportunity to Slovenian farmers and consumers for providing safe and quality food. The trend has been directed by the national policies regarding farming conditions and the EU's environmental goals. OF represents a form and method of farming that is gaining increasing importance in the Slovenian agricultural area, however, its origins date back to the early 90's. Due to the nature-friendly technological processes it enables the sustainable management of cultural landscapes and natural resources and at the same time promotes the principles of animal welfare or adaptation of breeding to a certain animal species and breeds. In OF, integrated crop production and animal husbandry are complementary, and thus they trace the natural methods and circulation of materials in nature (Online source 8).

OF at the same time ensures the production of high-quality and safe food, rich in nutritional value and with a high content of vitamins, minerals and antioxidants. Whereas the use of soluble mineral fertilisers can be chemically synthesized, plant protection products (pesticides), genetically modified organisms and products derived from such organisms, as well as a variety of growth regulators with this method of farming are prohibited, therefore there is virtually no expected residues of these substances in crops or foods and consequently in the consumer (Online source 9).

In the system of OF there is also a continuous and transparent control over the production and processing of these products or of foods from field to fork and thus guaranteed greater security for those consumers who opt for such products or food. Agricultural produce or foods can be labelled as organic if they receive a certificate. In 1998, there were only 41 growers or agricultural holdings involved in the control. In 2014, 3049 farms had already successfully completed a conversion period and acquired the certificate.

Up until now, the entrance of organic farms into the control system and the increase of organic surfaces constitute a continuous growth which is also expected in the future. However, there is still an urgent need for large quantities of crops and organized appearance on the market, with the raising of awareness of consumers and producers. The current production is dominated by grassland or livestock production, consumer demand is the largest for fresh vegetables and fruits, as well as by non-meat processed, this is a grain and dairy products.

Since 2001, OF is regulated with the rules for organic production and processing, which is coordinated with the European regulation on OF mode. With the passage of more agro-environmental programmes such as Slovenian agri-environmental program- SKOP, 2001-2003 and Rural development programme 2004-2006 organic farmers were eligible for direct payments for the enforcement of the measures of this programme. Financial incentives are designed primarily to reduce the intensity of the action and the use of naturally more friendly technological processes, preservation of the population, the sustainable use of natural resources and the production of safe and quality food, preservation of natural resources, biodiversity and traditional cultural landscapes, as well as measures in the area of special environmental constraints that apply to protected areas. This program became part of the Rural development programme of the Republic of Slovenia when the state entered the EU (RDP 2004-2006, RDP 2007-2013, RDP 2014-2020) (Online source 10).

In 2005, the Government of the Republic of Slovenia on the basis of a European action plan for organic food and agriculture adopted its own national action plan of the development of organic agriculture in Slovenia until 2015. The document supports all 21 acts of the European action plan and provides the analysis, identify the needs, objectives, and measures to promote the long-term development of an accelerated organic agriculture in Slovenia. The main aims of the plan were: the inclusion of the action plan into nation RDP 2007-2013, increase the share of organic farms to 15% by 2015, increase the share of utilised agricultural area in organic farming to 20% and 10% of Slovenian origin of organic food of the total quantities marketed food, triple the number of ecological tourist farms, etc. Many of these ambitious goals were not realised due the several reasons such as: not organized marketing chain for OF products, some organic products are still sold as conventional (especially milk and meat), advisory system is not well implemented into the practice for supporting conversion and for knowledge transfer and weak collaboration among organic farmers (the voice is not heard in the policy) (Online source 5).

OF will continue to be encouraged in the context of new perspectives 2014-2020, which, in accordance with the aims of the EU defines measures for rural development programmes and for the first time establishes a completely self-contained measure for OF which aims to promote agricultural holdings for the voluntary guidelines or implementing of OF. The payments cover commitments that are beyond the mandatory standards of the NS, the minimum requirements for the use of fertilisers and phytopharmaceutical products and other relevant mandatory requirements set out in national law (Online source 6).

In the context of the RDP 2014-2020 a holistic approach is set for OF through the merging of payments linked to the surface, or animals, and grant support for the implementation of investment and other activities, such as integration in short supply chain, the logistics platform and promotions. More focus will also be on activities like the transfer of knowledge and innovation, since OF produces many of eco-innovation and the transfer of them into practice wants to be promoted.

4.3 Rural development programme (RDP)

RDP is a joint programming document of Slovenia and the European Commission and is the basis for the disbursement of funds from the European agricultural fund for rural development. The authority responsible for the preparation of RDP and for monitoring, control and evaluation is the Ministry of agriculture, forestry and food.

During the programming period 2014-2020 the basis for receiving funding is the RDP RS 2014-2020, which was approved by the EC in early 2015. The priorities that Slovenia identified on the basis of an analysis of the features and status of agriculture, agro-food sectors and forestry and its integration of these economic sectors in the rural areas and the whole space are: the acceleration of the processes of structural adjustment in the agricultural sector, more effective marketing organization of agriculture, strengthen the agri-food chain, to improve the visibility and quality of locally sourced products, the preservation of natural resources and response to climate change, sustainable exploitation of forests and increase the added value of the wood. A part of the program are as well green jobs and the harmonious development of rural areas. The transfer of knowledge and innovation, care for the environment and climate change are horizontal aims that are pursued by all the priority areas of action. In the framework the programme will carry out 14 actions that are also divided on sub-measures.

In March 2016 European Commission approved the first changes to the RDP 2014-2020 mostly in the agri-environment-climate payments scheme, OF and animal welfare that will benefit to Slovenian agriculture (Online source 18).

4.4 Sustainable – green agriculture

The new reform for the period from 2014-2020, is responding to the environmental, economic and territorial challenges with greater emphasis on sustainable development, the strengthening of the competitiveness of agriculture and rural development. The essential new feature is the Green component which devotes 30% of direct payments to agricultural practices, which are beneficial for the climate and the environment within which the measures will be implemented: diversification of crops, maintenance of permanent grassland and areas of ecological significance. Specific support will be passed on to young farmers who will start with agricultural activity for the first time. The support is intended to facilitate the start-up activities and the structural adjustment of their holdings. With this a generational rejuvenation in the agricultural sector will also be stimulated. A new element is the scheme for small farmers means a simplification of the procedures for entry into the scheme. Better targeting of direct payments is also reflected in the new terms and conditions for receiving direct payments to so-called active farmer, the minimum size of the agricultural holding.

Because Slovenia also follows the policies of the European aims the Government of the Republic of Slovenia in 2014 adopted a strategy for the implementation of resolutions on the strategic development of the Slovenian agriculture and agro-food sectors by 2020. The resolution defines the vision and goals of the development of agriculture in Slovenia in the next medium-term by 2020, and represents a response to the challenges facing agriculture in the 21st century. At the forefront of the resolutions is the pursuance of the multifunctional role of agriculture and agricultural development through the goals of sustainable development. This is based on the account of the economic, environmental and social role of agriculture. The objectives are defined through the presentation of the situation in agriculture, the global and the European framework and development advantages and options. Agriculture is understood in its broad sense, together with the associated economic sectors and their impact on the environment, space and rural resources. Strategic goals and programs will be realized in the context of strategy with the help of the various measures under the Rural development programme 2014-2020, of the regulation on

direct payments in agriculture, market price measures, national sectoral strategies or plans.

4.5 Permacultural farming

Permaculture is an approach to achieve sustainability and the whole world knows it. It is the answer to the findings of scientists, that there can be no unlimited use of natural resources and that we're getting close to the limits of growth. Despite some doubts about the unsustainable use of raw materials on our planet, as well as the exploitation of people make is certain that in the future we will have to work and live differently, as we have been until now. Therefore, with an imitation of nature (ecoremediation) and smart planning, we are already decreasing the costs of erosion, flooding, the disappearance of rare plant and animal species. However, there are still insufficient number of these kinds of approaches in education and because experiential learning is a necessity, in this paper we present methods of permaculture arrangements on school gardens. International Centre for ecoremediation is a professional institution that deals with these approaches on learning polygon for self-supply and permaculture in the Poljčane municipality.

Sustainable, permanent societies may be based only on what it can maintain and be restored on its own. Our current unbalanced policy, unsustainable use of the Earth and the lack of caring for people and the environment are already causing the need to change. The change must lead us back to the balanced society. The people who live according to the principles of permaculture, by observing the natural cycles have developed strategies which allow them to create their own system of sustainable life (Bell 2010). All it takes is the awareness that we cannot exploit nature endlessly and that we need to adapt to the natural rhythm (season, available resources, and the idea that we can do it). Permacultural systems are sustainable, give profitable crops, require minimum effort for maximum result, they are ethical and caring for the Earth and people and generate surpluses, which we share with others. This part of Permaculture and the real results that are already visible on the Learning Centre for self-sufficiency in Dole, are the starting point of realising that even educational institutions can be directed to the use of permaculture in school gardens. We always need practical experience before going into something new. Therefore, in this paper, we have gathered ways of organizing garden with the use of permaculture. These methods are simple, and convince us that in the nature the matter and energy circulate, and that the easiest thing to take into account is the nature's own guidelines. By creating our own permaculture gardens we can develop creativity, connect health, movement and food production and make a special contact with the soil, plants and animals, thus creating added value. The world's biggest problem nowadays is the lack of fertile soil.

In recent years, several initiatives have arisen to connect to the network of ecovillages in Slovenia. Members seek to maximise the self-sufficiency with food, sustainable housing, connection with nature, caring for healthy development of humans and a solid social ties within the community, which is based on the development of the basic principles of permaculture. This represents the starting point of the ecological planning and engineering, which develops a sustainable human settlements and self-sufficient and self-endurable agricultural modular systems that are modelled on the examples of natural ecosystems. This is an integration of traditional knowledge and modern innovative approaches in the field of agriculture, building and environmental planning. This means a coexistence of human and nature, where there is an intertwining of ecology, landscape, sustainable agriculture, architecture and

agroforesting. Within existing initiatives already comes to the first organized direct exchanges of organic crops – the so-called partnership farming.

In the new programming period from 2015 to 2020, with the introduction of agro-environmental and agri-climate payments promotes a high agricultural practices, which represent higher requirements than normal agricultural practices. The support is primarily intended for the management of agricultural land, which contribute to the conservation of biodiversity and the landscape, the protection of water resources and by adapting farming contributes to mitigating and adapting to climate change. In the context of the measure it supports and promotes methods successfully used primarily in permacultural farming, for example. the application of coverage, coverage of the soil with a groomed fallow ground, leaving unmown bands on meadows, etc.

4.6 Biodynamic farming

At the beginning biodynamic farming was strongly influenced by the situation in agriculture after the first world war. In time of war, industrial production was highlighted and food production has been neglected. Therefore, agricultural land after the first world war were in a very poor condition. The second cause was Justus von Liebig's theory about feeding plants with mineral fertilizers, which has led to a rapid degeneration of plants, decline in the quality of the crop and depletion of soil. The German farmers and powerful land owners were aware of and because of that they called Rd. Steiner in to help them. He taught eight lectures on the agricultural course in 1924 in Koberwitz and with this he moved the principles of biodynamic farming, which was the first organic farming as an alternative to chemical agriculture.

"Biodynamic farming ranks among ecological ways, but its standards are more stringent. It's a self-sustaining process of food production, which is based on the completion of a circle within the farm, includes mandatory animal husbandry, use their manure in the form of compost, and local production and distribution systems using domestic breeds and varieties, which should contribute to the preservation of the environment, biodiversity, and improving the lives of farmers." The essence of biodynamics is that it is based on self-sufficiency and achieving of natural balance by strengthening and reactivation of the living forces of cosmic energies that needs to be relinked with the Earth, that Maria Thun has shown in her seed sowing calendar that was a recapped after Rudolf Steiner.

Organic farmers who are eager to obtain the right to use the trademarks of Demeter must be in an organic control for at least two years. Products with this brand has been around since 1928, controlled by the International Association of Demeter International, which manages and awards quality certification Demeter.

In Slovenia, the administrator for the brand Demeter is the Institute Demeter, who leads all activities in order to obtain the rights to use it. Each biodynamic farmer must be a member of the institute and attend at least five annual meetings organized by it and further education in collaboration with the Faculty of agriculture in Maribor. He must also be a member of one of the local society Ajda that offer basic knowledge of biodynamics. For biodynamic farming is a subject to all statutory provisions that also apply to organic farming, taking into account the Demeter's international guideline.

4.7 Ecoremediation in agriculture

Agro-environmental programs of the common agricultural policy are increasingly supporting the sustainable approaches for the reduction of the negative impacts of

agricultural activities. Ecoremediation (hereinafter referred to as ERM) in Europe is increasingly being recognized as a sustainable approach to environmental protection and possible addition to the measures of the environmental program in agriculture. The Slovenian environmental programme largely stresses the preservation of specific values of Slovenian rural areas, such as the traditional forms of farming, conservation of cultural heritage and the typical Slovene landscapes and conserving the diversity of animal and plant species. Thanks to the friendly nature of traditional farming practices in Slovenia in the past, the agricultural space preserved many biotopes of animal and plant species and the variety of finely structured cultural landscape).

The design and implementation of environmental programmes is based on the principles of sustainability, in a cost-effective way and policies of environmental protection and aim to achieve the objectives, such as improving the standard of living in rural areas, the conservation of the population on farms in an environmentally friendly way, the protection of the traditional rural landscape, preservation of soil fertility with environmentally friendly production and processing, environmental protection, improving the quality of drinking water sources and the preservation of biodiversity. For an efficient and effective realization of those objectives a complement of the measures ecoremediations should be introduced as an innovative approach to protect and restoration of degraded environments. They are a natural systems and processes whose primary purpose is the sustainable management, which enables integrated territorial development in a given area and contributes to the harmony of human and nature and mitigates natural disasters.

Ecoremediations are an innovative, environmentally and health friendly technology, which includes the collection, containment, cleaning and reusing water. In so doing, ecoremediations take advantage of and promote the self-cleaning ability of natural ecosystems, and complements wit constructed wetlands, vegetational belts and other sustainable methods that imitate nature and processes in natural ecosystems. These are the reasons why ecoremediations are extremely useful in agricultural areas, because they are using the appropriate methods of reducing or even prevent the runoff of nutrients and protective agents in the waters and groundwater, but also provides water for watering.

The possibilities of using ERM to reduce the negative influence in agriculture and as an alternative to complement measures of agro-environmental programmes are:

- The reduction of contamination of groundwater with nitrates, phosphates and pesticides, and organic matter and ammonia compounds from livestock farms and in areas with agricultural and horticultural production;
- The reduction of air pollution;
- Reduce the effects of wind erosion and mudslides;
- Reducing the accumulation of pesticides in the soil;
- Reduction of salinated soils;
- The increase of landscape diversity and biodiversity;
- Holding water and enriching the groundwater;
- Act as a supplement to the existing system for the prevention of pollution;
- To prevents drying out, etc.

With the ERM we can successfully complete the measures of agricultural environmental programme and with that we can improve ecosystem services the agricultural landscape on a sustainable and long lasting way, we can contribute to increased and better products and its protection and at the same time, we guarantee

the protection of the surrounding ecosystems from the negative impacts of agriculture.

ERM are fully in line with the latest programming documents and strategies such as the water act, the law on nature protection, the law on the environment and also with the EU water framework directive (WFD), which was adopted at the end of 2000 and is included in the Slovene legislation.

5. Research work on the field of Agroecology

We present key research institutions at the national level (agricultural faculty, private and public institutions and societies), which operate in the various fields related to OF and other sustainable forms of farming (permaculture, biodynamics). Research results also include areas such as biodiversity, renewable energy, environmental protection, rural development, and content related to the area of agroecology in the broadest sense. Research work is linked with basic EU and national strategic documents and legislation, aiming at ensuring food security and sustainable food production. The research activity in agriculture is carried out and financially supported within the Measures of Rural Development Programme 2014-2020.

5.1 Faculty of Agriculture and Life Sciences, University of Maribor

Faculty of Agriculture and Life Sciences (FKBV), University of Maribor, independently and in collaboration with scientific groups and other institutions is engaged in the development, applied and fundamental researches as research projects for direct users. Research activity is carried out through the research groups and a number of independent research projects (international, fundamental, applied, targeted research and other research projects for direct users). The researchers published the results of research in top international scientific journals, on scientific congresses and symposia at the global and European level, as well as at home. In recent years, this is a very mutually strengthened international cooperation FKBV with a number of eminent global and European institutions. The faculty is involved in many research projects in the field of organic farming.

On the website of the faculty, we came across the fact that at the Department of Agricultural Economics and rural development, which was formally established in 2003, also works in the area of research for rural development, agriculture, AE space. Research was carried out under the methodological premises such as: statistical methods in the environment and biological, that are organized in three different sessions/Labs (agricultural economics, agricultural policy, marketing of the agricultural and rural development and management and information systems in the agricultural sector). Members of the Department are active as leaders of national and international research projects and their research results are published in a high-profile scientific journals with impact factor, spatial analysis and socioeconomic analysis.

5.2 The Agricultural Institute of Slovenia

The Agricultural Institute of Slovenia is the leading research institute in the field of agriculture in Slovenia. It comprehensively deals with the issues of modern agriculture and is expanding its activities into the fields of environmental protection and ecology. It employs 176 workers, of which 85 are researchers. It is a public research institute that performs fundamental, applied and development research and specialist tasks and agriculture, publishes the results of scientific research work as well as professional

and supervisory work, performs tasks based on authorization and accreditations and checks the quality of agricultural products and products used, and agriculture. The Institute also engages in the training of producers, education of young persons and consultation for various users and agriculture. The Institute performs its activity within the nine departments and an independent Service for Official Certification of Seed and Plant Propagation Material. The majority of research and professional work is done at the laboratories and in the experimental fields and plantations.

Research work at the Agricultural Institute of Slovenia is linked to the broader areas of agriculture, ecology and protection of the environment and follows the needs of providing food security and sustainable food production in Slovenia, which is reflected in the protection of the environment, preservation of soil fertility, biodiversity and traditional rural agricultural landscape. Research work is based on the Resolution on the strategic development of the Slovenian agriculture and agri-food sectors by 2020 –Zagotovimo.si food for tomorrow, and in the European framework programme for research and the innovation of 2014-2020-"Horizon 2020". The research work is carried out in the framework of the programming of the groups Agrobiodiversity, sustainable agriculture, the competitiveness of the agri-food and Infrastructure programs.

The scope of the research program Agrobiodiversity includes agricultural plants and animals and their wild relatives and the species which are connected with them in any relation. The researches focus on the genetic structure of populations, provide insight and understanding of the ecological and evolutionary processes and contribute to the theoretical and practical starting points for the development of effective and environmentally friendly methods to control the economically important pest and quicker adaptation to climate change. Development of the methods and tools for the purpose of breeding agricultural plants, study the genome, biology of plants and pathogens and physiological research.

The research work of the program Sustainable agriculture refers to the quantitative and qualitative aspects of food production (livestock farming, beekeeping, fruits, berries, viticulture and winemaking), and environmental issues (in the direction of improved production technologies for plant protection, the rational use of energy, water and soil protection and preventing of greenhouse gas emissions) (Online source 11).

5.3 Biotechnical Faculty (BF), University of Ljubljana

The research work of BF includes areas of science in agronomy, biology, genetics, biotechnology, forestry, landscape architecture, wood science and technology, microbiology, natural heritage protection, zootechnics and agro-food sectors and is organized into 22 different programs and 47 research groups. Pedagogic work is successfully linked and supplemented by basic and applied research work.

On the website we came across with the fact that different departments of the Faculty in recent years have carried out a variety of research programmes, in particular in the field of agriculture, ecology, environmental protection and rural development. In 2015, the Department of Agronomy carried out some research programs that are substantively related to AE: agroecosystems, crops-genetics and modern technology, animal health, the environment and food safety. As an educational institution, the faculty will be presented in the chapter Research/Pedagogy (Online source 12).

5.4 Institute for Sustainable Development (ISD)
ISD is a private non-profit institute founded in 1995. Its broader objective is the implementation of the principles of sustainable development in the praxis as well as their integration into national and EU strategic development programmes. ISD is an active member of EEB – European Environmental Bureau and IFOAM – International Federation of Organic Agriculture Movements and IFOAM EU Regional Group. ISD's specific objectives are: Implementation of sustainable development in agriculture and rural development; Protection of nature in agriculture and by the help of agriculture and Enhancement of living connections between urban – rural – nature.

Topics of work are:
- OF – conversion, technologies, system approach; support of marketing initiatives,
- Implementation of sustainable development principles in policy and practice,
- Protection of environment and biodiversity, sustainable management of natural resources in agriculture,
- Agricultural and rural development policy,
- Millennium Development Goals and OF,
- Impact of our lifestyle (focus: food, fodder, fuel) on Developing Countries,
- Innovative projects of sustainable rural development,
- Holistic approach to nutrition and quality of food,
- Sustainable production and consumption / lifestyle,
- Eco-tourism / agro-eco-tourism,
- Enhancing the role of the non-governmental organisations in the development of strategic programmes at different levels (national, EU, international) and their implementation.

Methods of work: research and development; providing advisory and expertise (especially in OF); informing, awareness raising, training, education, publication; organisation of conferences, seminars, workshops and other public events; networking and lobbying; focused work with target groups (farmers, rural population, experts, children) (Online source 13).

5.5 Chamber of Agriculture and Forestry of Slovenia (CAFS)
Chamber of Agriculture and Forestry of Slovenia is the umbrella interest organization of natural and legal persons in the Republic of Slovenia engaged in agriculture, forestry and fishery. Its central task is to protect and represent their interests, to consult them and accelerate economical and environment friendly activities.

Preferential tasks are: Acceleration of development and improvement of economic conditions; Assurance of specialist services operation; Co-formation of legislation; Improvement of social conditions in life; Keeping settlement of Slovenian rural areas; Promotion of Slovenian agriculture at home and abroad. Specialised services of the chamber are: agricultural advisory service, selection and monitoring production in stockbreeding, forestry advisory service, centres for fruit-growing and nursery.

The Chamber works on 3 levels: Chamber's Headquarters in Ljubljana, 13 district subsidiaries established throughout Slovenia; 59 local units operating on a local level. The Chamber is also involved in various projects and research, which are substantially related to the field of OF and sustainable development. The content of the international research project SAGITER, content-specific refers to the field of AE and we have explained in more detail in the chapter on Definitions of AE (Onine source 14).

5.6 International centre for ecoremediation, Faculty of Arts, University of Maribor
The International centre operates within the Faculty of Arts at the University of Maribor, in the context of development, international and national research projects in the field of sustainable development, self-sufficiency, ecoremediations, AE, natural resources, monitoring of soil properties and the properties of the water.

A broad preventive work of the centre: prevention of pollution of the environment by educating, raising awareness and information, protection and development of the protected areas with ecoremediation (sustainable tourism, agriculture), the protection of the environment by ecoremediation, in particular in areas where it is not possible to use the classical technologies (compilation on rural sewage with a dispersed urban dwelling, protection of the coastal area, the protection of sources of drinking water, groundwater protection, protection of watersheds, mitigating climatic extremes of watercourses such as drought and floods), on the degraded areas to carrying out sustainable ways of rehabilitating (sustainable eco-remediation of landfills, dumps, sediments with heavy metals, municipal had and others).

Below we present a survey conducted by the Institute for the promotion of environmental protection, the results were used in the article Permaculture as a new opportunity for the younger generations and it was published in the International Journal of Infinity Press in England.

6. Education and agroecology

We present the key institutions of formal education (agricultural faculties and higher education levels of the biotechnical schools) in our country, carrying out the educational programme under which learners acquire knowledge and skills, especially in the field of agriculture, ecology, nature conservation, spatial planning and protection of the environment. A support for formal education are as well various training programs and education, carried out by the institutions and institutes in particular for beneficiaries of environmental measures and the interested public, both at the local, regional and national level.

6.1 Faculty of Agriculture and Life Sciences (FALS), University of Maribor
FALS is the second largest educational institution in the field of agriculture in the country. With its operation, it contributes to the development and strengthening of agriculture throughout Slovenia. In the last period, it has also crucially contributed to the preservation and further recovery of the whole agricultural sector in the northeast of Slovenia. The faculty plays an important role in the environment, in particular in terms of economic development. The mission of the Faculty is to search for technological and business-organizational solutions to achieve a significantly higher level of self-sufficiency of the Republic of Slovenia with food through innovative production, manufacturing and business processes.

The training is carried out at all stages of Bologna study programmes, which is continuously updated with the achievements of basic research conducted within the framework of scientific research work at the University. Modern studies of agriculture give an expert profile with the necessary general professional as well as completely specific skills. Graduates gain, in the context of education at various levels of study, a lot of basic and practical knowledge that is offered to them by top-trained professors.

Study programmes are carried out in the framework of the 14 different chairs. At the I. Bologna cycle, there is one university (agriculture) and six higher professional study programmes (livestock, organic agriculture, agronomy-ornamental plants, vegetables and other crops, biosisystemic engineering, viticulture, fruit growing and wine production and management in the agro-food sector and rural development), at the II. Bologna cycle there are three study programs (agriculture, agricultural economics and food safety in the food industry) and at the III. Bologna cycle, there are two study programmes (agriculture and agrarian economics). On the Faculty website, we identified that the contents of agro-ecology are a part of a study program which are AE and agro-ecosystem and AE and mineral nutrition of field and vegetable crops (Online source 15).

6.2 Faculty of mathematics, natural sciences and information technology, University of Primorska

In the context of the University of Primorska, they carried out a regular master's 2. Bologna cycle study programme (120 ECTS). After the completion of the study a graduate acquires a master's degree in nature conservation and environmental protection. The program will educate graduates with the essential knowledge and skills in the field of the protection of nature and the environment. The basis for this is the understanding of the role of organisms at different levels, understanding of the importance of ecosystem services and the identification of changes in nature. Study programme covers both terrestrial as well as protection of marine ecosystems, which gives students a chance to choose a desired areas of nature conservation.

The aims of the curriculum are: to familiarize the students with the importance of diversity at the area of breeds, ecosystem and genetic level; to acquaint students with the principles of the natural population; to educate students in the field of environmental engineering and environmental technologies to address a wide range of environmental issues; to enable students to study interactions of plant and animal species with the environment; to inform students with possibilities of prevention and mitigation of changes in natural systems (Online source 16).

6.3 Biotechnical Faculty (BF), University of Ljubljana

Biotechnical faculty, University of Ljubljana, is the largest institution of this kind in the country and includes university, higher education, professional and postgraduate education, scientific, professional and advisory work in the field of living nature (Department of biology and Microbiology Department) and the agriculture, forestry and fisheries (Department of forestry, Department of animal science, Department of Agronomy) and related production technologies (Department of food science and Technology Department, and the Department of biotechnology). Scientific research work involves basic scientific areas of agronomy, biology, genetics, biotechnology, forestry, landscape architecture, wood science and technology, microbiology, natural heritage protection, zootechnics and agri-food sectors and is organized into 22 different programs and 47 research groups.

On nine different departments at the faculty is study programmes at all levels (higher education, University, master's and doctoral program), with a variety of subjects, in which the students acquire the knowledge and competences, in particular in the field of organic agriculture, ecology and biodiversity, forestry and forest ecosystems are carried out. Between the programs we have not noticed a subject that would directly address the area of AE, but students become familiar with the basics at least partly in the context of other subjects such as the ecological base of environmental protection, agricultural botany, plant ecology, plant and animal ecosystem etc.

The aim of the courses is to educate and to raise professionals who understand the interdisciplinary nature of the profession, knowledge of the basic methods of science, technology, economics and social sciences and are able to use it in the management and implementation of sustainable development in agriculture, forestry, landscape, agri-food sectors and biotechnology. The course of the study, students acquire the knowledge and skills such as planning, organization, management and implementation of technological processes and support services (Online source 17).

6.4 International centre for Ecoremediation (ICE), Faculty of Arts, University of Maribor

ICE is developing new knowledge on the links between environment, economy and society, leads several projects, participates in educational programs of all levels and participates in the preparation of books, workbooks, manuals etc. The ITC also organizes and conducts professional development for teachers and workshops in the areas of soil, water and ecoremediations, self-sufficiency, permaculture and AE. The mission of the International Centre for ecoremediation at the Faculty of Arts is to develop knowledge for the coexistence of human with nature.

For the purpose of education ICE has produced a catalogue of educational programs in five different content sections: Programs for experiential teaching for teachers; programs for creative and innovative research for pupils and students, other useful skills for everyday life, visits to the learning polygons, tourist programs.

Every program is carried out in practice, at the starting point the work is experiential, participants learn how to plan, implement and evaluate the results of their work. With this they gain permanent skills that they can use in everyday life. Visits to the learning polygons are meant for pedagogical staff, learners, the heads of development agencies and various societies.

6.5 Higher education

In the field of higher education in the field of agriculture, students can choose from a wide range of biotechnical professional high schools such as Biotechnical centre Naklo, Technical School Centre Nova Gorica, Biotechnical education centre Nova Gorica, Biotechnical educational centre Ljubljana, educational centre Pyramid Maribor. After the completion of education candidates obtain professional qualifications and the title of engineer.

While studying they gain a wide variety of professional theoretical and practically useful knowledge in the field of agriculture, breeding organisms, nature conservation, and many other content that are needed for agriculture and rural areas to make progress in terms of sustainable development (Tal, Morag 2009).

6.6 Non-formal education and training

Some of the faculties and institutes conducted an informal professional training and education, in particular for the beneficiaries of the measures of agro-environmental programmes. Thus, Faculty of Agriculture and Life Sciences, University of Maribor, with the collaboration of the Institute for sustainable development carried out mandatory annual training for organic farmers, who entered in the measure of payments for OF from rural development of the Republic of Slovenia for the period 2014-2020 (measure EK). Every year, farmers must take at least a 6-hour mandatory training programme in relation to the organic content, which are a condition for obtaining payment for the measure.

Chamber of Agriculture for agriculture carried out verification procedures and certification for obtaining national professional qualifications, which is intended for adults who:

- do not have a public document of professional or technical education,
- who have the professional competences (knowledge, skills, experience),
- who want to advance in their career, without having to obtain a higher level of professional education,
- an individual acquires a national professional qualification,
- after parts of the educational programs for the purpose of obtaining professional education,
- after programs of vocational training and advanced training if these programs are provided,
- if they prove that they reached the standards of the expertise and skills adopted in accordance with this Act.

7. The importance of agro-ecological knowledge

In accordance with the present educational programmes and courses we consider that the knowledges of AE are not accessible to the general population of students, but only to those who are studying agriculture and to all those who choose elective subjects in the field of ecoremediation, protection of soil, sustainable water planning and sustainable development of protected areas, which shall be carried out through the Department of geography as a part of physical geography. Additional educational opportunities are through lifelong learning approach where very much is going on. In Slovenia, there are a variety of workshops, lectures and field views from the substantive areas of AE. Most of the training takes place in a private-individual level. This kind of education also links theory with practice. While the so-called academic education is more tied to the theoretical approach (Stutz, Warf 2005, Sage 2012).

Trends in organic agriculture in Slovenia are not positive, because of the subsidy, on which this approach is based on, are declining and therefore the number of organic farms is also decreasing. Classical-oriented farms in Slovenia still use phytopharmaceutical products and extensive use of nitrogen, which has a negative impact on underground water and soil. Therefore, agriculture in Slovenia is considered as the main culprit for the polluted soil and underground water. Selective subject AE at the University of Primorska exists seven years, but since the study programme has been formed it has not yet been selected, which can be an indicator of low interest in this content.

We conclude that official education in Slovenia with the current systems does not effect on the knowledge of AE and that this content should be more integrated into the educational process. This is already happening on the "unofficial" level, because many organized it for themselves and want to gain knowledge in the field of AE. Thankfully, schools are already informed and enable children additional field education in these areas. It is necessary to point out that this education also involves the generation elder than 65 who attends workshops and many are starting with the natural way of food production for the first time in their lives. Therefore, there is more knowledge in the society about the AE than the official systems are showing. Here it is necessary to stress the importance of the media, who are daily trying to enter these kind of content on the radio and TV programme, many number of magazines have issued in the field of production and processing of food. And another important fact,

Slovenians are a nation of gardeners and everyone wants to take a very good care of their land, so it is going to be a growth in AE.

8. Conclusion

Most of descriptions of AE are based on the environmental aspects of sustainability and underlines its importance. Although the content of AE is not yet implemented into the formal curricula, students and pupils are already learning about AE principles within informal educational programmes based on learning by doing methodes.

AE as a sustainable agriculture concept is not official applied in the stategic policy, but some sustainable principles linked with AE are already carried out especially at local and regional level, due the preserved traditional agricultural management and knowledge of small family farms. The scope of the legislation and regulations shows that the focus is on financing forms of sustainable production of OF, but that there are some other forms that are quite unknown, in particular, there is no substantive support for sustainable forms of farming. Therefore, we miss policies put forth by AE consisting of the transfer of traditional forms of farming in the practice of what is now understood as an alternative farming. In addition to OF today we have developed other forms such as permaculture and biodynamic farming which are stil not financially supported or implemented in the legislation and strategic documents.

Slovenia is in diversity a rich country and it has great potential for further development toward AE, but the cooperation of all stakeholders and innovative approaches are needed for developing unique Slovenian agriculture based on sustainable small size family farming model with adequate social standards.

At the national level the interest for AE knowledge and practice is recognised, but the administrative and financial limitations enables more effective progress toward AE, thus we present the only way of introducing skills from AE into society with the self-sufficient learning polygon Dole, that is based on permaculture and ecoremediations, biodynamics and meet the content of AE approach. Below, we present in brief the learning polygon Dole as an example of good practice.

References

Dunphy, A., Spellman, G. 2009: Geography fieldwork, fieldwork value and learning styles. International Research in Geographical and Environmental Education 18:1, 19-28. DOI: 10 1080/10382040802591522.

Odum, E.P. 1983: Basic Ecology. Harcourt Brau, Philadephia Saunders College Pub.

Piercea, J. 1990: The food resource. New York, Longman Scientific & Technicl, 334 pp.

Raman, S. 2006: Agricultural sustainability – principles, processes and prospects. New York: Food products Press, 474 pp.

Sage, C. 2012: Environment and food. Routledge, 320 pp.

Stutz, F., Warf, B. 2005: World economy. Resources, location, trade and development. Upper Saddle River, N.J., Pearson/Prentice Hall, 543 pp.

Tal, T., Morag, O. 2009: Reflective Practice as a Means for Preparing to Teach Outdoors in an Ecological Garden, Teacher Education. London: Springer Science, 2009, pp. 242 – 265.

Online source 1: Kmetijsko gozdarska zbornica Slovenije. Retrieved from http://www.kgzs.si/GV/Aktualno/V-srediscu/Novica/ArticleId/2307/Projekt-SAGITER.aspx
Online source 2: Sagiter Project web site. Retrieved from http://sagiter.eu
Online source 3: Wikipedija prosta enciklopaedija: Agroekologija. Retrieved from https://sl.wikipedia.org/wiki/Agroekologija
Online source 4: Ministrstvo za kmetijstvo, gozdarstvo in prehrano. Retrieved from http://www.mkgp.gov.si/si/delovna_podrocja/kmetijstvo/
Online source 5: Vlada RS, Akcijski načrt razvoja ekološkega kmetijstva v Sloveniji do leta 2015. Retrieved from http://www.mkgp.gov.si/fileadmin/mkgp.gov.si/pageuploads/podrocja/Kmetijstvo/Ekolosko_kmetijstvo/ANEK_slo.pdf
Online source 6: Ministrstvo za kmetijstvo, gozdarstvo in prehrano: ekološko kmetijstvo. Retrieved from http://www.mkgp.gov.si/si/delovna_podrocja/kmetijstvo/ekolosko_kmetovanje/
Online source 7: Ministrstvo za kmetijstvo, gozdarstvo in prehrano: Integrirana pridelava. Retrieved from http://www.mkgp.gov.si/si/delovna_podrocja/kmetijstvo/integrirana_pridelava/
Online source 8: Kmetijsko gozdarska zbornica Slovenije: Ekološko kmetovanje. Retrieved from http://www.kgzs.si/gv/kmetijstvo/ekolosko-kmetovanje.aspx
Online source 9: Ministrstvo za kmetijstvo, gozdarstvo in prehrano. Retrieved from http://www.mkgp.gov.si/si/delovna_podrocja/program_razvoja_podezelja/
Online source 10: Cunder T. Strukturne spremembe v Slovenskem kmetijstvu. Retrived from http://revije.ff.uni-lj.si/Dela/article/view/1337/1141
Online source 11: http://www.kis.si/en/About_the_Institute_1/
Online source 12: http://www.bf.uni-lj.si/en/deans-office/scientific-research/
Online source 13: http://www.itr.si/home
Online source 14: http://www.kgzs.si/gv/eu-in-svet/english.aspx
Online source 15: https://aips.um.si/PredmetiBP5/UcnaEnotaInfo.asp?Zavod=10&Jezik=&Leto=2015&Nacin=1&Predmet=7337
Online source 16: http://www.upr.si/sl/univerza
Online source 17: http://www.bf.uni-lj.si/dekanat/studijski-programs/
Online source 18: http://www.mkgp.gov.si/en/media_room/news/archive/2016/3/select/sporocilo_za_javnost/article/12447/8686/

AGROECOLOGY IN SLOVENIA
Summary

Agroecology (AE) as a sustainable agriculture concept is not official applied in the stategic policy, but some sustainable principles linked with AE are already carried out especially at local and regional level, due the preserved traditional agricultural management and knowledge of small family farms. The scope of the legislation and regulations shows that the focus is on financing forms of sustainable production of OF, but that there are some other forms that are quite unknown, in particular, there is no substantive support for sustainable forms of farming. Therefore, we miss policies put forth by AE consisting of the transfer of traditional forms of farming in the practice of what is now understood as an alternative farming. In addition to OF today we have developed other forms such as permaculture and biodynamic farming which are stil not financially supported or implemented in the legislation and strategic documents. Slovenia is in diversity a rich country and it has great potential for further development toward AE, but the cooperation of all stakeholders and innovative approaches are needed for developing unique Slovenian agriculture based on sustainable small size family farming model with adequate social standards.

Slovenian innovative practices are introduced in the field of AE at the local and regional level. The AE is represented primarily as a practice and science aspects: educational (educational programs for all stakeholders based on AE principles), technical (new technology for efficient use of renewable resources, AE principles for food production and processing), economical (improving the economic standard of small-scale farmers, the setting up of new sales concepts), social (networking and integration of the various participants in the community, an increase in social activities in the community, promoting a healthy lifestyle), as well as political (regional administrative support). With selected examples we want to encourage small farmers in particular, and the various stakeholders of local communities to take advantage of the benefits of agro-ecological approaches that contribute effectively to the sustainable development of the local environment. The focus is on sustainable use and conservation of renewable and natural resources with low levels of external inputs, connecting local community for the purpose of increasing the social and economic benefits of individual and the community, adaptation to climate change and local natural conditions and environment, the reduction of pollution and environmental protection, nature conservation, promoting restoration of the soil and biodiversity in production systems. These measures strengthen the operation and integration in the community and increase the long-term benefits of the region, the establishment of a healthy lifestyle and the strengthening of responsibility at the individual level.

In accordance with the present educational programmes and courses we consider that the knowledges of AE are not accessible to the general population of students, but only to those who are studying agriculture and to all those who choose elective subjects in the field of ecoremediation, protection of soil, sustainable water planning and sustainable development of protected areas, which shall be carried out through the Department of geography as a part of physical geography. Additional educational opportunities are through lifelong learning approach where very much is going on. In Slovenia, there are a variety of workshops, lectures and field views from the substantive areas of AE. Most of the training takes place in a private-individual level. This kind of education also links theory with practice. While the so-called academic education is more tied to the theoretical approach.

Trends in organic agriculture in Slovenia are not positive, because of the subsidy, on which this approach is based on, are declining and therefore the number of organic farms is also decreasing. Classical-oriented farms in Slovenia still use phytopharmaceutical products and extensive use of nitrogen, which has a negative impact on underground water and soil. Therefore, agriculture in Slovenia is considered as the main culprit for the polluted soil and underground water.