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Towards Sustainable Development and Green Economy in European Union: Trends and Educational Prerequisites in a Local Context

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Abstract

Sustainable development is suggested by environmentalists as the solution for confronting the intense environmental, social and economic problems that emerge globally in the last decades. This study presents the recent features and trends of the associated concepts, like the green economy, green entrepreneurship, green professions and labour-market, with a particular reference to European Union countries. In the course of transforming the current economic model towards a green direction, vocational education appears as a fundamental prerequisite that will prepare the future workforce of green economy. In this respect, a small-scale research is also presented, recording the relevant opinions of senior high-school students in Western Attica (Greece), being an area of acute environmental, social and economic problems.

Keywords: sustainable development, green economy, green entrepreneurship, green professions, green labour-market, green skills, green collar workers

1. Introduction

The climate change is a major environmental challenge and a priority of environmental policies in all Member States of the European Union (EU) and is often linked to other environmental issues or areas of policy action such as water scarcity and energy. The climate pressures due to higher temperatures, reduced rainfall and rising sea levels have led to policies focused on energy and water management. At the same time, the development model that has prevailed in our world over the last few decades, having as a criterion for success the maximization of the quantity of goods produced and the economic results, has caused serious damage to the environment that creates risks for the planet and for humanity (Vlachaki, 2012, p. 65). This is recognized by many international organizations and most countries are trying to find ways to tackle this problem as well. Thus, the global community is strongly convinced that tackling the multifaceted crisis that our world is facing can be successful by improving our attitude towards the environment and adopting a new development model that will be interested in protecting the planet, in addition to the economic outcome (CEDEFOP, 2011, pp. 23-27).

In the context of planning economic programs to tackle the economic crisis, significant sums of money have been spent exclusively on tackling climate change and moving towards a low-carbon economy through national aid packages. The relevant costs are mainly related to the energy efficiency of buildings, renewable energy, low carbon vehicles and sustainable mobility (railways, waterborne). Green restructuring measures have also been promoted by investing in traditional sectors that can meet the demand for low-carbon products, with large investments in the automotive sector. This in turn has led to environmentally well-developed industries, which have created a demand for an increasing number of jobs and for their corresponding skills. However, while climate and environmental change strategies recognize the need for professional skills to allow producers to respond to guiding policies, there are few prime strategies for the development of professional skills for the environment (CEDEFOP, 2011, p. 45).

Consequently, a new development model is emerging, called *sustainable development*, that involves extensive changes in the way that many people work. Accordingly, traditional activities are now being pursued in a manner that damages the environment as little as possible, along with new activities that are being developed to protect and restore the environment, often based on new technologies. The employment in these new ways is called *green employment*, while a series of vocational education and training programmes for the labour-market are being developed, directly linked to an energy efficient and climate-friendly industry (Vlachaki, 2012, p. 65).

2. Sustainable Development

The concept of sustainable development is not yet completely defined internationally. It generally refers to the developmental model that gives priority to environmental protection, also taking into account the viability of economic activity, as opposed to the "predatory exploitation" of the global resources (Vavouras, 2010). *Sustainability* is the acquisition of maximal goods from the environment, without however interrupting the natural rate of production of these goods in a satisfactory quantity in the future. Nevertheless, the interrelated prerequisites for its existence are *decoupling*, *savings*, *utilization of technology*, *employment creation* and *interventionism* (Efthimiopoulos & Modinos, 2003; Hatzibiros, 2007). More specifically:

- Decoupling is to achieve economic growth without aggravating environmental problems. It is realized when the growth is disconnected from the inputs of traditionally produced energy and raw materials. Decoupling is considered to be strong when there is no increase in the environmental degradation observed, as in the case of emissions of many gaseous pollutants. It is promoted by introducing obligations for users to make reasonable use of resources and to promote innovation, leading to cleaner production technologies (OECD, 2001).
- Savings is about changing the wasteful way of life by restraining an excessive resource consumption. It requires interventions at both individual and operational levels. Regarding the former, raising awareness, educating citizens, developing environmental consciousness and rational environmental behaviours can make a significant contribution in this direction. At the operational level, the introduction of technological improvements and innovations can also make major changes, like for example in the usage of products that are quickly converted into waste (EEA, 2012).
- Utilization of technology can be transformed from a significant part of the problem into a key element of the solution, since most of the old technologies are not environmentally friendly as they lack decoupling and savings. The adoption of *mild technologies* may ensure the sustainability of resources and environmental protection that are required, without creating social risks, such as catastrophic accidents (Vlachaki, 2012, p. 10).
- Employment creation by using economic tools that achieve both environmental and social goals at the same time. According to the Organization for Economic Cooperation and Development (OECD, 2004), environmental protection activities such as saving energy and other resources, anti-pollution technology, toxic substitution, waste recycling, new cleaner production methods, the organization and exploitation of nature's protection etc. create many jobs.
- Interventionism is not about promoting environmental protection with market mechanisms alone. The globalized market is characterized by various shortcomings, including failure to ensure economic development, full employment and environmental protection. Corrective interventions are therefore needed through governmental actions. The integrated environmental policy, with a legislative, administrative, scientific/technological, economic and ideological dimension requires public intervention by the state or transnational organizations, as well as by civil society. Tools such as the land-use and urban planning may effectively promote environmental protection. Economic tools are also an important way of intervening to promote sustainable development and employment.

The sustainable development requires the development of the productive structures of the economy, alongside the creation of infrastructures for a sensitive attitude towards the natural environment and ecological problems, namely a path towards the creation of a new economic model of operation in modern societies, the so-called *green economy*.

2.1 Green Economy

Green Economy improves human well-being and social justice, while significantly reducing environmental risks and ecological deficiencies (UNEP, 2008). In addition, it is the implementation of ecological economics with emphasis on renewable energy. Ecological economics is an interdisciplinary field of academic research aimed at studying the interdependence and co-evolution of the human economy and natural ecosystems over time throughout the geographical space (Xepapadeas, 2008). Ecological economics are distinguished from the environmental economy, the latter being the conventional economic analysis of the environment, since the former treat economy as a subsystem of the ecosystem, emphasizing on maintaining natural capital (Bergh, 2001). The guide to ecological economic analysis and assessment is the issues of intergenerational justice, the irreversibility of environmental change, the uncertainty of the long-term effects of human intervention in nature and the sustainable development (Malte, 2008).

Green economy is not only linked to the technological transformation in a more friendly production process for the environment and the exploitation of sustainable energy deposits, but it is also typically associated with the full restructuring of the economy, defined as (UNFCCC, 2007):

- Environmentally sustainable, based on the belief that our biosphere is a closed system with finite resources and limited capacity for self-regulation and self-renewal.
- Socially fair, based on the belief that culture and human dignity are precious resources and (like natural resources) require responsible management to avoid exhaustion.
- Local, based on the belief that a genuine link to the particular place is a prerequisite for sustainability and justice.

Several ecological economists have questioned the fundamental prevailing economic approaches, such as the cost-benefit analysis and the distinctness of economic figures from scientific research, arguing that economics are inevitably normative rather than empirical (Peter, 2008). An alternative proposed approach is the *positional analysis*, which attempts to integrate time and justice issues (Mattsson, 1975). According to a survey conducted by German ecologists (Illge & Schwarze, 2006), ecological and environmental economics are different disciplines of economic thinking, with ecological economists supporting *strong sustainability* and rejecting the suggestion that the natural capital can be replaced by the capital created by humans.

The most important economic activities in the green economy are the following (Ernst & Young, 2006): collection, treatment and disposal of waste and recycling; wastewater treatment; collection, treatment and provision of water; green constructions; atmospheric pollution control; public administration; renewable energy and environmental protection. The business activity that is carried out in the context of green economy is called *green entrepreneurship*.

2.2 Green Entrepreneurship

Green entrepreneurship is the particular form of economic activity that puts environmental protection and nature, in general, at the heart of its strategy and requires the company's positive attitude towards environmental protection, both in terms of its products or services and its production processes (EOMMEX, 2008). The green entrepreneurship concept recognizes that:

- The business environment is part of the natural environment. All natural resources, used in the real economy, come from land, air and sea. Their global reduction is a major limitation to business development.
- The dominant production and consumption systems are wasteful. They come mainly from the abundance of oil and other minerals. The smarter production systems are based on the efficient use of resources (natural, economic and human), reducing their ecological footprint along the way.
- It is possible to produce many standard and industrial products, whose quality is an important factor in improving the quality of life. The green business by definition provides quality services that make people's lives better.

The key features of green entrepreneurship are (Zisis, 2010): quality avant-garde, systematicity, collectivity, progressive pragmatism, economic viability, local connection to the economic and social well-being, contribution to environmental sustainability and the absence of business inflation, namely not having many similar businesses, as this reduces their sustainability. The private economic direction is the most crucial point for green entrepreneurship. This is because it is a challenge area that will emerge and be recognized by the search for the production of new products, which identify and meet a new consumers' demand that can fulfill the conditions of sustainable development (OECD, 2001). Entrepreneurs are the driving force of a market economy and their achievements offer consumers a variety of choices and in society wealth and jobs (CEC, 2003) for boosting employment.

2.3 Green Employment & Occupations

The Worldwatch Institute (2011) defines *green employment* as those activities in the primary, secondary, tertiary and quaternary sectors of economy that contribute to maintaining or restoring the environment. As a result, *green occupations* concern professional activities that (Psomas 2009): protect ecosystems and biodiversity, contribute to the rational use of energy and natural resources, reduce water consumption, lead to a low-use economy of using coal and limit the creation of waste and pollutants. They are also jobs that have a long-term perspective, are well-paid and contribute directly to environmental protection (Apollo, 2008).

Studies have been carried out on green jobs in many countries, based on green economic activity in some key categories. Although there is a general consensus on how a green economy acts, there are however different approaches to how jobs are defined in the green economy (Slaper & Krause, 2009). According to the United Nations Environment Programme (UNEP, 2008), *green labour* is working in the fields of agriculture, constructions, research and development, as well as management and services that contribute substantially to maintaining or restoring environmental quality. Namely:

- help protecting ecosystems and biodiversity;
- reduce energy, materials and water consumption through high-performance strategies;
- relieve the economy from carbon dioxide production;
- lead to the minimization or complete avoidance of creating all forms of waste and pollution.

These green jobs are classified in each production sector (Dierdorff et al., 2009; Lifetrends, 2009), as below:

- In the primary sector (agriculture, livestock, fisheries, mining, forests).
- In the secondary sector (industry, constructions, renewable energy, reuse and recycling of waste).
- In the tertiary sector (basic services, commerce, logistics, agro-tourism).
- In the quaternary sector (administrative and government services, education, research and development, economic planning, media, culture, information management).

In general, green occupations can be also roughly classified in three categories (Vlachaki, 2012, p. 59): New green professions (e.g., environmental engineer), professions that require more green skills (e.g., mechanical engineer specialized in renewable energy sources), professions that require retraining to become more green.

At the international conference of 2007 in Bali (Vlachaki, 2012, p. 20), the need was recognized to change employment internationally in order to underline its contribution to addressing climate change. Climate change is related to the pattern of energy production and consumption that has prevailed over the last decades, while the increasing impact of its consequences in recent years has prompted a change in both energy production and consumption patterns. It is obvious that millions of people will be working in this new energy model, called from now to be able to respond to these new needs.

2.4 Green Labour-Market

In a global environment where unemployment is growing amid more general stagnation or recession, a realistic view is that not only it is enough to create more green jobs, but also to make the existing jobs more green. Investments in renewable energy sources (RES) have already reached $ 100 billion, which is translated to a rise of 18% in new energy investments alone. Respectively, similar investments are being made in the field of research and marketing of products of lower energy consumption. In USA, it is expected that 1.3 million green jobs will be created by 2030 (Bagnied, 2013). Indeed, it is also estimated that by 2030 the number of workers, especially in alternative forms of energy, could exceed 20 million globally and, according to the Food and Agriculture Organization of the United Nations (FAO), 10 million jobs could be created in the forestry sector alone, which would primarily benefit Asia and Africa (Vlachaki, 2012, pp. 20-21). The number of people working in the EU on environmental issues is over 3.4 million, or 0.7% of total employment in the EU (WWF, 2009), but the percentage varies considerably from country to country. For example (Ragila, 2010):

- In Italy, green jobs are expected to reach 1.3-1.5 million in a decade.
- In UK, the green jobs market grew by 58% in 2008, rising steadily.
- The lowest relative employment rate in the EU (0.1%) is observed in Greece, but according to a study (Psomas, 2009), by 2020 green jobs are expected to exceed 256,000.

A study in the EU (Vlachaki, 2012, p. 22) shows that a 30% -50% reduction in carbon dioxide emissions by 2030 in key-sectors of the European economy (energy, steel and cement, transportations and constructions) may bring an overall increase in employment of about 1.5% at these key-sectors, while this increase could generally reach 20 million jobs (UNEP, 2008).

The above factors outline the profile of a worker with a high level of education and training, who can cope with the challenges that he/she has to face at his/her workplace. But all these cannot be accomplished without investing in education and knowledge.

3. Green Skills & Vocational Education

It is often difficult to distinguish between new environmental professions and existing ones that become more green, but the systems for determining skill needs regarding the environment and responding to these needs are already well-established in most EU Member States. (CEDEFOP, 2011, p. 30). A study in Denmark (Brøndum & Fliess, 2009) reviewed the new professions that arose as a result of the new environmentally friendly opportunities and found that 12 skills' areas characterize green jobs:

- basic professional knowledge (processes, technologies, materials, market and its dynamics);
- understanding the market and users' behaviour (specifying solutions);
- the impact of globalization, competitive advantage, business models and partnerships;
- innovation (regarding processes, products and business models);
- Information and Communication Technology (ICT);
- knowledge of production technology, installation and maintenance;
- knowledge of material technology, such as alternative materials, and reuse of materials;
- environment, climate and sustainability;
- communication skills, including knowledge of English and teamwork;
- process and scheduling;
- automation;
- testing and documentation.

Concerns have been raised about the lack of readiness of policy makers, regarding the demand for new skills as part of the green economy. This situation results from problems where the demand for skills has increased significantly and there are shortcomings in education and training actions. Thus in EU, labour-market policies, including education and training strategies, have been developed for responding to industrial restructuring (CEDEFOP, 2011, p. 29). The framework that they have set for identifying future skills-needs is mainly organized around formal qualifications or education and training systems by sector. The recognition of green skills is not an integral part of these systems and is mainly done ad hoc at the level of regional administration and self-government. Regional or local authorities, sectorial organizations and even companies themselves are usually the first to identify green skill-needs, but are often characterized by a lack of coordination and formal methods for predicting skill-needs (CEDEFOP, 2011, p. 35). Nevertheless, they exhibit a faster response than relying on national systems to deal with new skills demand (CEDEFOP, 2011, pp. 47-48). Additionally, meeting skills-needs is hampered by general labour shortages and, in particular, by a lack of interest in science and technology, leading to a shortage of available technical skills (CEDEFOP, 2011, p. 46).

3.1 Vocational Education & Training

The existing education and training systems coped with the demand for new skills whenever new green professions were created or whenever existing green professions required further green skills. In general, new or additional green dimensions in the vocational profiles can be achieved by renewing existing skills. However, a need for improvements to the existing educational and training systems is widely recognized by all EU Member States, in order both to meet the needs for environmental skills and to recognize the need for increasing the environmental awareness of the public. A particular emphasis on improvements tended to be given in Initial Vocational Education and Training (IVET), rather than in lifelong learning or tertiary education (CEDEFOP, 2011, p. 48). Skills' deficiencies may also be limited by exploring how the environmental education and training measures and approaches (including pilot projects) can be used to reduce the rate of school dropout and improve the career prospects of young people from migrant families (CEDEFOP, 2011, p. 49).

The previous traits of sustainable development can be summarized in the following chain of arguments:

- Sustainable development is a global necessity for dealing with intense environmental problems.
- Sustainable development is realized through the transformation of the current model of economy towards a green direction, namely green economy.
- Green economy creates new jobs and professions that require green skills or transforms older ones towards a green dimension.
- Apart from the environmental ones, acute social problems, including unemployment (along with an

associated criminality), social exclusion and migration can be dealt with by the growth of a green labour-market within green economy.

- The workforce for the green labour-market, called *green collar workers* (Wickman, 2012), has to be educated and/or trained accordingly.
- Vocational education is the prime tool for the preparation of green collar workers.

The above chain of arguments is best exemplified by the typical case of clean energy production through *renewable energy sources* (RES). The development of RES is among the major environmental priorities in EU (CEDEFOP, 2011, p. 26) and consequently an issue of most important concern for green economy and labour-market.

3.2 The Example of RES

There is a strong and lasting interest in EU for achieving energy autonomy through RES in European islands (Kalogirou, 2018; Kaldellis et al., 2009). An island is ideal for such a pilot-implementation, because the area is well-defined and the resources usually limited due to the difficulties in transportations. Notably, 3.5% of the European population lives in islands, while this percentage increases significantly from late Spring to early Autumn, during the high tourism season (Vlachos et al., 2018). The Aegean Archipelago islands (Greece) alone have 600,000 inhabitants (Kaldellis & Zafirakis, 2007). For this ambitious purpose, there are two major / strategic interventions implemented: the PRISMI project (Rikos & Perakis, 2018) and the Interreg MED community (Boulanger et al., 2018). Within the context of these major interventions, local projects have been or are implemented in many European islands that notably include:

- Agathonisi (Kaldellis et al., 2012) and Tilos (Boulogeorgou & Ktenidis, 2018; Zafirakis & Kaldellis, 2018) of Greece,
- the Croatian islands of Adriatic Sea (Pfeifer et al., 2018),
- Corsica of France (Notton et al., 2018),
- the Gozo Region of Malta (Cassar et al., 2018),
- Faroe Islands (Katsaprakakis et al., 2018),
- the Orkney islands of Scotland (Hull, 2018) and
- the Favignana island of Italy (Groppi et al., 2018).

The production of clean energy in the above widespread cases is frequently associated with other environmental, technological or economic issues, due to the geographical isolation of the islands. These issues notably include:

- the development of weather prediction techniques (Papadopoulos, 2018) and related wind-flow databases (Calidonna et al., 2018),
- water supply systems (Kondili & Papapostolou, 2018) and sea-water desalination (Kaldellis & Kondili, 2007),
- transportations (Tournaki et al., 2018),
- energy storage technologies (Nikoletatos, 2018) and
- economic and managerial considerations (Anastasiadis et al., 2018).

The vocational diversity of these issues indicates also the variety of experts (green collar workers) from every educational level (vocational secondary, post-secondary and tertiary) that are required for the development of a single section (namely RES) of green economy.

Considering the above argumentation locally, the Secondary Education Directorate of Western Attica (WASED, Greece), within the working framework of its strategic and operational planning (Papakitsos et al., 2017a) that recognizes the interrelation between vocational education and labour-market (Papakitsos, 2016; 2018), proceeded to relevant activities in order to start confronting the acute social, economic and environmental problems of its area (Papakitsos et al., 2017b).

3.3 A Case of Local Considerations

The area of Western Attica is well-known in Greece for its intense social, economic and environmental problems that exist. These problems become even more complex because of the presence of diverse social groups (like domestic and foreign immigrants, ethnic groups, etc.). At the same time, there is a large increase of population observed, mainly because of domestic migration, there is a downgrading of natural resources, a loss of social cohesion and an uncertainty regarding economic growth. As an indication, there is a dump for receiving the waste of Athens metropolitan area (Greece), amounting to more than 1,570,000 tons of urban waste annually, while the local processing unit can manage only about 1,200 tons daily. Moreover, there are 23,000 tons of solid industrial waste received in the dump annually, with 4,500 tons being toxic and 8,500 tons being oil-waste (the remaining

10,000 tons of them are non-toxic). This entire problem-nexus is transferred to the daily activities of the school communities, causing additional difficulties to the educational process (Karakiozis et al., 2015).

Considering the local conditions, the promotion of green economy concepts through vocational education seems to be a tool that could help in confronting the complex existing problems in a hopefully unified and long-terms manner. Thus, the WASED experts in environmental education, counseling and vocational guidance initiated an attempt to record the opinion of senior high-school students about green professions, as the first part of a long-terms strategic plan that will also start increasing the combined environmental and economic awareness of the local youth. For this purpose, a questionnaire was designed (Appendix A), based on the existing classification of green professions in Greece (Vlachaki, 2012, pp. 60-63), which was handed out to 180 students of two selected senior high-schools. One of these schools is situated in a rural area with a rich natural environment, while the other one is in an urban area heavily industrialized that suffers from high rates (23.8%) of unemployment (ELSTAT, 2011), due to the prolonged economic crisis in Greece, pollution and other environmental problems. Thus each school is typical of its case. This selection aimed at recording the opinions of students from two environmentally different/opposite places.

3.4 Results & Commentary

Despite the afore-mentioned environmentally different position of the participating schools, only 5% of the students from both schools (N = 9) realized the concepts of green collar workers and expressed an opinion about it. This fact alone indicates the consistent efforts that are required to improve the awareness for the potentials of green economy. More specifically, by the answers to question No. 9 (Appendix A), regarding which subjects do the students like, only 33% of them like Chemistry and 22% like Natural Resources Management that are fundamental courses for the technical aspects of green economy, although opinions are better for Biology (100%) or Physics (78%) that are equally important (Figure 1).

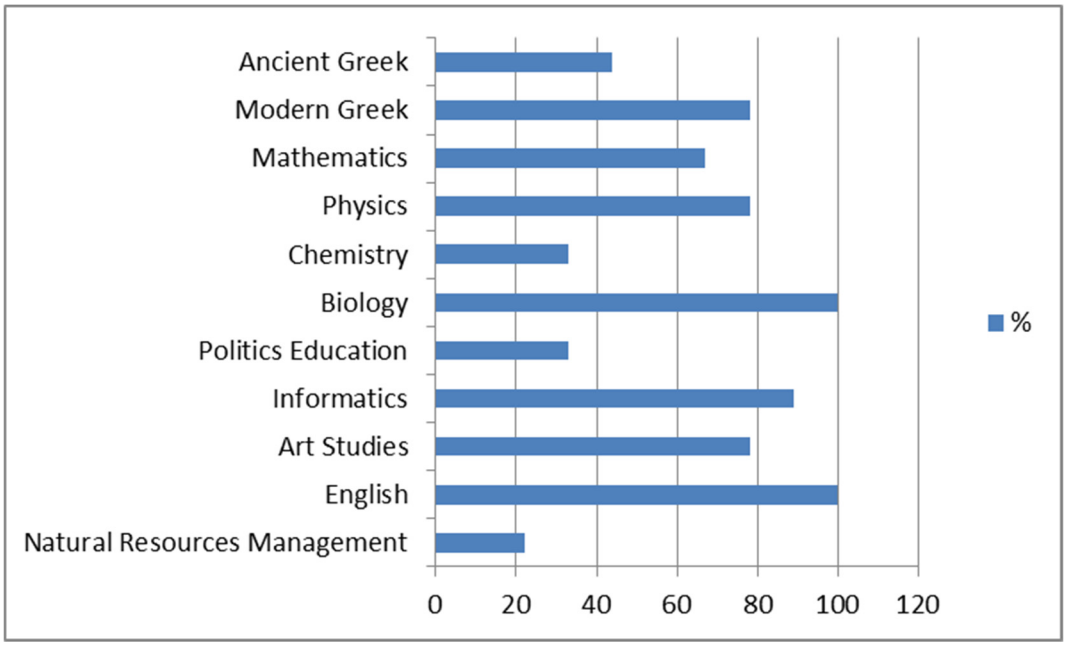

Figure 1. Popularity of subjects by the students of the sample

From the answers to question No. 10 (Appendix A), regarding which of the listed professions are considered to be "Green", some of them have comparatively very low values of recognition as such, like the Organic Farmer ([6]: 67%), the Anti-pollution Technician ([8]: 44%), the Forest Protection Specialist ([10]: 67%), the Environmental Engineer ([11]: 56%) or the Environmentalist ([15]: 67%), although being typically green ones (Figure 2).

Finally, although the answers to question No. 11 (Appendix A), regarding which of the listed knowledge / abilities / skills do the students think that are necessary for someone wishing to practice a profession that is considered "green", where somewhat more precise, the overall picture indicates that there is a lot to be done towards green economy and for a long time required.

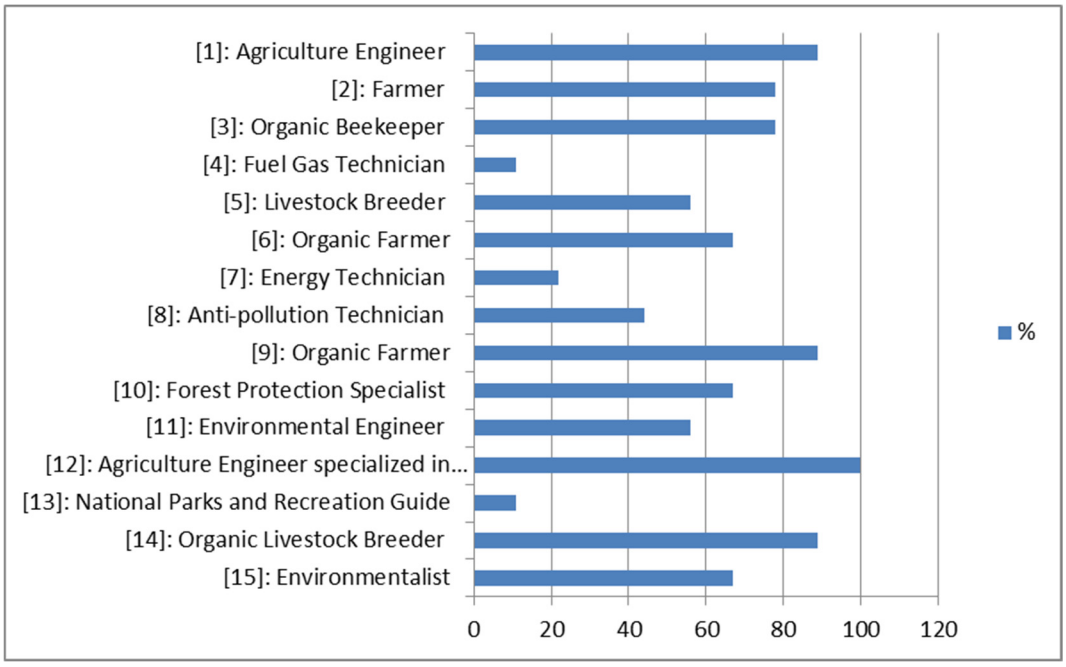

Figure 2. Recognition values of green professions by the students of the sample

The overall picture of the survey indicates that, despite the strong vocational perspectives of green economy, the local youth is either not interested in or not aware of the green vocational potentials, although the particular area has an urgent need for green professions to cope with unemployment and environmental protection. In order to reverse this situation, a better organizing and coordination of the local educational agencies is required (Papakitsos & Mavrakis, 2018), towards a holistic treatment of environmental issues that would integrate nature, economy and education.

4. Conclusion

The global community is currently confronted by two generalized crises (Vlachaki, 2012, p. 18):

- The economic one, which started from the developed Western world as a crisis in the banking system, got wider dimensions of financial crisis and today threatens the foundations of its established stabilization mechanisms, such as the EU;
- The environmental one, which instead has evolved gradually for many decades and its neglect had a greater economic benefit in the short term. Nowadays, non-action threatens the planet with irreversible damages, which they are transformed into a loss of capital resources that deeply concerns the governments worldwide.

The increase in the earth's population, the degradation of the natural environment, the reduction of energy reserves and the economic crisis affecting the developed societies are increasingly pushing for a substantial change in modern-day life. In the context of this change, there are two factors that shape decision-making: sustainability and human needs. Even according to the most skepticals, the solution to this complex problem lies both in sustainable development and in increasing employment in professional activities of the green economy (Vlachaki, 2012, pp. 52-53).

It is therefore ascertained that sustainable development supports and promotes new economic activities and thus leads to the creation of new jobs. It also enhances competitiveness, emphasizing quality and turning consumption towards this direction. The increasing demand for high-quality environmental goods strengthens the initial investments, attracts new capital and generates know-how. In any case however, the fundamental prerequisite is the existence of a workforce, with the necessary knowledge, skills and abilities to occupy green job positions.

All EU Member States recognize the importance of developing skills for making climate change policies fully effective and for achieving economic and employment goals. However, while there are governmental strategy papers on identifying the need for more education, there does not seem to be a dominant integrated skills-training strategy that will identify the needs for green skills of the professions involved (CEDEFOP, 2011). Investing in

education, lifelong learning and human skills to broaden educational choices may produce a high educational result and an increase in productivity. This is a fundamental prerequisite for the emergence of a country's human capital and the green transformation of the economy through sustainable development. The achievement of sustainable development though presupposes environmental awareness and proper vocational education/training, especially of the youth that may locally lack the relevant information and/or motivation. Accordingly, the local environmental and career guidance educational agencies should cope with this task in a holistic manner, since the future of sustainability depends on the youth's vocational choices.

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Appendix A

Questionnaire about vocational guidance and green professions

1. *Sex*: M / F
2. *School of study*: _____
3. *Grade of study*: 1st - 3rd
4. *Have you ever completed a career guidance test*: N / Y
5. *Please complete your father's profession*: Worker, Farmer, Private employee, Civil servant, Freelance, Unemployed, Retired.
6. *Please complete your mother's profession*: (Same as No 5).
7. *Please complete your father's education level*: Primary School, Junior/Mandatory High School, Senior High School, Post-secondary education, University (first degree), Postgraduate, Doctorate.
8. *Please complete your mother's education level*: (Same as No 7).
9. *Which subjects do you like, regardless of your opinion about the equivalent school courses?* [1 = Low to 5 = High]: Ancient Greek, Modern Greek, Mathematics, Physics, Chemistry, Biology, Politics Education, Informatics, Art Studies, English, Natural Resources Management.
10. *Which of the following do you think are "Green Professions"?* [1]: Agriculture Engineer [2]: Farmer [3]: Organic Beekeeper [4]: Fuel Gas Technician [5]: Livestock Breeder [6]: Organic Farmer [7]: Energy Technician [8]: Anti-pollution Technician [9]: Organic Farmer [10]: Forest Protection Specialist [11]: Environmental Engineer [12]: Agriculture Engineer specialized in Environmental Protection [13]: National Parks and Recreation Guide [14]: Organic Livestock Breeder [15]: Environmentalist.
11. *Which of the following knowledge/abilities/skills do you think are necessary for someone wishing to practice a profession that is considered "green"?* [1 = Low to 5 = High]:

- Professional knowledge of technology and materials;
- Knowledge of the market and consumer's behaviour;
- Knowledge of globalization (understanding business models and competitive advantage);
- Innovation abilities/skills in processes and products;
- Abilities/ kills in Information and Communication Technologies;
- Knowledge of production, installation and maintenance technology;

- Knowledge of material technology (reuse / use of alternative materials);
- Knowledge of the environment, climate and sustainability;
- Communication skills;
- Foreign languages (e.g., English);
- Collaboration in groups;
- Programming ability;
- Knowledge of automation;
- Documentation abilities through testing;
- Intercultural skills (e.g., recognition of a different identity);
- Administration/management skills by understanding the international economy;
- Management skills with an emphasis on the environment;
- Knowledge of managing environmental problems;
- Skills supporting climate actions;
- Analytical skills - Finding successful solutions beyond established;
- Ability to design and manage a project.

12. *Which of the following abilities/skills do you think are necessary in every occupation?*: (Same as No 11).
13. *To what extent do you believe you have each of the following abilities/skills?* [1 = Low to 5 = High]:

- Abilities/skills in Information and Communication Technologies;
- Communication skills;
- Foreign languages (e.g., English);
- Collaboration in groups;
- Programming ability;
- Documentation abilities through testing;
- Intercultural skills (e.g., recognition of a different identity);
- Administration/management skills by understanding the international economy;
- Analytical skills - Finding successful solutions beyond established;
- Ability to design and manage a project.

14. *Please evaluate each of the following proposals* [1 = Low to 5 = High]:

- I am influenced by my parents in my study/professional choices.
- I am aware of my abilities and skills.
- I will choose a profession that I want it a lot.
- I want to follow a profession that fits my abilities and skills.
- I will choose studies that will lead me to a secure career.