

Promoting organic farming by training in bio-fertilizers

National Case Study – Bulgaria

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1. National legislative framework and policy in organic farming and eco-friendly technologies

1.1. Basic data about current status in Bulgaria

1.1.1. The organic farming in Bulgaria

The organic farming practices in Bulgaria are developed in accordance with the new definition of agriculture adopted in EU as well as worldwide. This necessity appeared in order to understand the harmful effect of conventional agriculture on local and global environments and economies.

Globally, a lot of definitions about organic farming are introduced. In Bulgaria, a National Plan for Development of Organic Farming (NPDOF) is created in relation with the European Action Plan for Organic Food and Farming. In this plan a definition in accordance to FAO/WHO Codex Alimentarius guidelines for organic food is used, where organic agriculture is defined as *"a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasises the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system."*

1.1.2. The motivation for elaboration of NPDOF of Bulgaria

A very important dare for Bulgaria in economic transition and development is to build up a balance between the plenty production of food and the important amplification of the employment rate with substantial protection of the environment.

Organic farming and other integrated agrienvironmental practices play significant role in sustainable rural development in Bulgaria. In this way stabilization of ecosystems, preservation and restoration of natural resources, prevention of land abandonment is achieved. Only a small area of the agricultural land in Bulgaria is polluted in the past and new pollution has not occurred in the last 7-8 years. However, there is a serious soil erosion problem, which covers about ¼ of country's territory. The intended development of agricultural sector is based on the EU policies and programmes and this can lead to

intensification and corresponding soil degradation. The EU Programme SAPARD and the Structural Funds after EU accession give opportunities for development of organic farming and establishment of environmentally friendly agricultural practices. They are expected to improve soil fertility preservation and to diminish the pollution in agricultural lands.

Organic farming supports the stabilization of the farmers' income by introducing perspective new and developing markets for their high quality products and in this way ensuring reduction of the unemployment in rural areas. This main problem is focused also in the European Action Plan for Organic Food and Farming. Bulgaria has developed convenient conditions for organic farming and this is a chance the country to contribute substantially in organic farming production demand in the EU and worldwide.

The very beginning of the organic farming in Bulgaria is dated of the 60-ies but the interest increases in the last 20 years. Thus, a Strategy and National Plan for Development of Organic Farming was prepared accordingly to the conclusion of the Conference "Perspectives of the Organic Agriculture in the Enlarged European Union" held in Plovdiv in 2003 by the Ministry of Agriculture and Forestry (MAF). This NPDOF was elaborated in the period October 2004 – June 2005 and was co-financed by the Swiss Agency for Development and Cooperation and MAF. The process was supported by the Bioselena Foundation that provided logistic support as well as by the involvement of wide representation of stakeholders. A working group was created with more than 30 representatives of key stakeholders' organisations, organic farming experts from NGOs, scientific institutes and consulting bodies. The NPDOF draft was broadly discussed with more than 600 stakeholders in the country during the period March – April, 2005.

1.1.3. Current situation of the organic farming in Bulgaria

According to MAF and the Agri-environment Department decisions from 2003, the organic farming methods are applied on 8364 ha cultivated land. The control settings information indicates that the area under organic way of cultivation (the already certified one and that in conversion period) by the end of 2005 is 12284,14 ha or 0,22 % of the Used Agricultural Area (UAA). Area of 11 771, 47 ha is certified and the land in conversion comprises 512,67 ha. The comparison with the data from 2003 shows that the area under organic production had arisen significantly for only 1 year. Such certified areas for wild berries, herbs and mushrooms are 62 183,95 ha. In fact, 12 green houses for organic production of fruits and vegetables with 206 440 m² that correspond to 20,64 ha were

certified as agricultural area. The greenhouses are mainly for fruits and vegetables. Also, there were 77 holdings for organic plant production (56 are already certified and the rest 21 were in conversion in 2004). One of the organic holding is mixed – for plant and animal production.

1.2. Existing national agricultural legislative framework and policies

1.2.1. Bulgarian strategies, plans and programmes for development of organic farming

National Rural Development Plan 2000–2006

It is built in compliance with EU Regulation EC 1257/99 and is related to utilization of funds under the SAPARD Programme of the EU. The next Rural Development Plan for the period 2007–2013 is in action, when Bulgaria has become an EU member-state and benefits from the funds for implementation of CAP. This document prompted creation of National Rural Development Programme where the Agrienvironmental measures are mandatory. These agrienvironmental actions were experimented under 1.3. Measure of the NARDP 2000-2006 under SAPARD Programme. The aim was to assess the impact of the implementation of environmentally friendly practices and activities in specifically identified and contrasting regions of the country. One of the basic activities under this measure was the support of organic farming.

National Strategy on Conservation of Biodiversity (1995)

The Bulgarian National Strategy on Conservation of Biodiversity claims that the key matter is implementation of convenient mode of action for management of natural resources. It has to take into account the conservation and restoration of the natural resources for the protected areas as well as outside them. The agriculture is prominent sector of the economy having major impact on the biodiversity. Thus, the National Strategy is oriented towards sustainable development of the agricultural sector and pointed out that the organic farming method is one of the very promising and most adequate.

National Environmental Strategy 2000–2006³

The National Environmental Strategy determined as a basic aim the improvement of quality of life of humans through provision of healthy and advantageous environment and

opportunities for its conservation. In order to accomplish this goal an integration of the environmental policy into the other sectoral policies, including the agriculture is necessary. Thus, the organic farming development is among the strategic subjects included in the National Strategy on Environment (2005–2014)⁴. In this document it is envisaged to increase the share of the UAA covered by organic method of cultivation to 3 % of the total UAA.

The Strategy and the Plan (2005–2012) for Capacity Building of Republic of Bulgaria

To implement its obligations in compliance with the UN Framework Convention on Climate Change, the UN Convention on Biological Diversity and the UN Convention to Combat Desertification Bulgaria defines the organic farming as an economic sector, which will contribute to the achievement of the aims of these three Conventions.

Bulgarian legislation related to organic farming

Bulgarian environmental legislation (Laws on water, land, air quality, human health, wild flora and fauna) as well as other legislative acts (ordinances) provide the common framework for regulation of some activities to be done by the economic actors, including agricultural activities. The agricultural producers are free to choose the kind of agricultural activity they want to apply and the method, i.e. organic or not, but their nature preservation duties are legislatively mandatory. In this context, organic farming method is one of the most effective approaches in the agricultural sector ensuring compliance with environmental legislation.

The most important special legislative acts arranging organic farming activities are as follow:

- LAW on plant protection (promulgated in State Gazette 91/10.10.1997 amended in State Gazette 18/5.3.2004);
- LAW on animal husbandry (promulgated in State Gazette 65/8.8.2000, amended in State Gazette 18/5.3.2004);
- LAW on foodstuff (promulgated in State Gazette 90/15.10.1999, amended in State Gazette 70/10.8.2004).
- ORDINANCE No 22 of 4 July 2001 on organic production of plants, plant products and foodstuffs of plant origin and indications referring thereto on them (promulgated in State Gazette 68/3.8.2001);
- ORDINANCE No 35 of 30 August 2001 on organic production of livestock, livestock products and foodstuffs of animal origin and indications referring thereto on them (promulgated in State Gazette 80/18.9.2001)

The above mentioned acts laid down the basis for development of organic farming compliant to the sustainable development requirements in the agricultural sector and its contribution to biodiversity conservation.

Art. 6 of the Law on foodstuff regulates that “organic” are only foods which are produced in accordance with the rules for organic production and with the inspection rules for it. The same Law defines in what cases the words “organic” or “bio” could be used as an indication on the products. The foodstuff Law redirects also to the other two acts in relation to the organic farming - Law on protection of the plants and Animal Husbandry Law.

Art. 12a of the Plant Protection Law as well as Ordinance 22 regulate the strict rules for production of plants, plant products and foodstuffs of plant origin and indications referring thereto on them. Through these legislative acts the EC Regulations on organic plant growing or production of organic plant food products are harmonized. Such plant products are organic only in case the requirements of the Ordinance are followed – for soil fertility preservation and improvement, for utilization of plant protection materials and for usage of organic seed material.

Art. 14 – 14f of The Law on animal husbandry and also Ordinance 35 regulate the rules and conditions for organic production of livestock, livestock products and foodstuffs of animal origin and indications referring thereto on them. Through these acts the EU legislation on organic methods for animal breeding and production of organic animal products is introduced into the Bulgarian one. The animals are kept or the animal products are produced in compliance with organic farming rules when the Ordinance requirements are followed for: animal provenance, the feed rules, disease treatment and prevention, livestock units density per ha according to animal species and age, so that the produced manure not to exceed the equivalent of 170 kg nitrogen/ha/year and the rules for open air animal breeding and for requirements for the buildings in which the animals are kept.

1.3. The obstacles and constraints in organic farming and bio-fertilizers application

The achievement of the overall strategy for organic farming implementation goes through answering of a set of questions among which:

- How to apply organic agriculture as a strategy to combat many of the negative effects of conventional agriculture, such as pollution and loss of soil fertility?

- How practices, such as the use of bio-fertilizers, can enhance plant growth over the use of chemical fertilizers?
- How to apply the high potential of the vermicompost to benefit land in agricultural use?
- How to promote organic practices' associations in their goal to reach increased soil fertility, increased biodiversity, and greenhouse gas sequestration?
- How to reduce the negative effects of organic agriculture practices, such as an increase in nitrogen pollution or pests?

1.3.1. Agricultural biologicals and their regulation

Nowadays, the environmental pollution is world's big concern, because of considerable and persisting accumulation of harmful compounds coming mainly from industry and agriculture, and bringing about bioaccumulation effect and bio magnifications. The timely finding and cancellation of toxic chemical compounds in the environment, especially in water and soil, is of crucial importance, since these actions prevent their harmful biological effects on organisms. Conventional agriculture practice that comprises wide application of chemical fertilizers made the food production self-dependent. However, this practice caused serious deleterious effect on the ecological niches: it reduces water retaining capacity of the soil, its fertility and disappearance of soil nutrients. Additionally, the overuse of chemical fertilizers in agriculture is costly. Hence, the need to develop some low cost effective and eco-friendly fertilizers, which would work without harming the nature, arose.

Bio-fertilizers - the eco-friendly opportunity for agriculture

Bio-fertilizers are defined as a product containing carrier based (solid or liquid) living microorganisms that are agriculturally useful in terms of nitrogen fixation, phosphorous solubilization or nutrient mobilization. They contribute to plant growth promotion by increasing nutrient absorption, plant pathogens suppression and production of hormones, etc., which are beneficial for agriculture.

As a safe alternative to chemical fertilizers, bio-fertilizers minimize the ecological disturbance and are cost effective, eco-friendly and when they are required in bulk can be generated at the farm itself.

The application of bio-fertilizers friendly practices is motivated by convenient certification schemes (e.g., GlobalGAP or organic farming schemes) as well as by specific regulations (e.g., the EU Directive 2009/128 indicating sustainable pest management practices). The regulations for diminished use of chemical fertilizers prompted the enhanced use of organic ones. They are considered as a suitable approach to alleviate the pressure on the environment coming from chemical based agricultural practices.

Why bio-fertilizers are needed?

Bio-fertilizers and bio-pesticides hold the potential to increase farmers' current agricultural productivity, while at the same time contributing to the soil's ability to produce more in future. A number of countries, Bulgaria among them, have embraced these technologies with promising results. The list of potential commercial products that promise increased yield for the farmer continues to grow.

The use of chemical fertilizers has led to the pollution and contamination of the soil, water basins, as well as has injured native microorganisms and friendly insects, making the crop more amenable to diseases and diminished soil fertility. Needs of the crops are much higher than the supply. Currently it is appreciated that by 2020 the necessary production of 321 million tonnes of food grain will be necessary. At the same time the requirement of that nutrient will be 28.8 million tonnes, while their availability will be only 21.6 million tonnes being a deficit of about 7.2 million tonnes. Depleting feedstock/fossil fuels (energy crisis) and increasing cost of fertilizers facilitates the need of bio-fertilizers. This is becoming unaffordable by small and marginal farmers, depleting soil fertility due to widening gap between nutrient removal and supplies, growing concern about environmental hazards, increasing threat to sustainable agriculture. Besides above facts, the long term use of bio-fertilizers is economical, eco-friendly, more efficient, productive and accessible to marginal and small farmers over chemical fertilizers.

1.3.2. Bulgaria within the framework of the global regulatory environment for bio-fertilizers

The challenges for most countries revolve around inadequate legislation, inadequate capacity and weak implementation of bio-fertilizers and bio-pesticides policies, where they exist. Although the situation is similar across countries, some countries can be described as having completed the process of developing regulatory systems, others as having interim or

work in progress frameworks and yet others with no regulatory frameworks for bio-fertilizers and bio-pesticides respectively.

A legal definition of bio-fertilizers as a marketable product is of special importance for producers, who intended to commercialise it. However, currently in European Union (EU) there are no legal definitions for the term 'bio-fertilizer', or specific legal provisions determining its features. In the EU, microorganisms (bacteria, viruses and fungi) are included as possible inputs in the EU Commission Regulation n. 889/2008 on organic production, but only for the biological control of pests and diseases. They are thus listed within legal framework dealing with plant protection products, as biocontrol agents.

Bulgarian legislation is in full compliance with EU one, and in the National Plan for Development of Organic Farming in Bulgaria 2007 – 2013 this situation is properly reflected. Considering the trend of the policies in developed countries for a more sustainable and environmentally friendly agricultural activity (e.g. EU COM (2011) 21; EU COM (2011) 627; EU COM (2010) 2020 final) and the globalisation of the markets for microbial-based fertilisers, there is a need of developing adequate standards and legal provisions to support the production and use of bio-fertilizers (i.e. formulated products containing microorganisms). This could be initially developed at international level through the ISO Standards, updating the currently available standards for fertilisers and soil conditioners or by developing a new standard under the ISO Technical Committee 276 on Biotechnology.

1.3.3. Legal quality of bio-fertilizers

To assure a proper quality of the product for the final users, the legislation should introduce other parameters to be controlled at production level, which can later be reflected in the labelling requirements. The lack of specific regulations in the European Union setting quality parameters for bio-fertilizers is leaving space to national or regional rules, which are not homogeneous. For example, the Polish Law on Fertilizers and Fertilization of July 10th 2007 includes "growth stimulators" in the category of plant conditioners. These are products which have "a positive impact on plant growth or other metabolic processes of plants in other ways than plant nutrients" and shall "pose no threat to [the] health of humans or animals or to the environment after their use according to use and storage instruction". This definition can be applied to bio-fertilizers, but no specific requirements are foreseen for such category of products.

Spain, which is the second largest producer of conventional fruit and vegetables after Italy and among the leading countries in organic crops in Europe, does not include the term 'bio-fertilizer' in its legislation. The newest legal provision dealing with fertilizers (Real Decreto 506/2013) defines the number of microorganisms in organic amendments and compost but does not mention plant beneficial microorganisms.

1.3.4. Bio-fertilizers vs. chemical fertilizers: advantages for the farming

Overuse of chemical fertilizers can result in negative effects such as leaching, pollution of water resources, destruction of microorganisms and beneficial insects, crop susceptibility to disease attack, acidification or alkalization of the soil, or reduction in soil fertility, all of which cause irreparable damage to the overall ecosystem. The advantages of using bio-fertilizers are numerous, among which the most important are related to;

- Better balanced nutrient supply, consequently healthy plants;
- Enhanced soil biological activity; colonization of mycorrhizae; soil structure;
- Increased organic matter content of the soil and buffering the soil against acidity, alkalinity, salinity, pesticides and toxic heavy metals;
- Slow release of nutrients and maintenance of residual organic pool;
- Encouragement the growth of beneficial microorganisms and earthworms and contribution to the suppression of certain soil-borne plant diseases and parasites.

2. Target groups for realization of organic farming training policy

2.1. The vision for the Organic Farming (OF) sector development through education at EU/national level

- Measures to increase the professionalization of the OF will enhance stability, reward achievements, and decrease inefficiencies in staffing. Enhanced autonomy must be supplemented by minimum requirements for capacity and qualifications.
- The education of VET professionals and their professional development is recognized as inherently important for creation of EU knowledge-based society (Communication from the Commission. The Social Agenda [COM92005) 33 final], 2008; <http://europa.eu/scadplus/leg/en/cha/c10127.htm>). A conclusion was made for shifting dimensions of the role of teachers/trainers and other training facilitators,

and competencies they need to effectively respond to these changes. These needs were identified by a Working Group (Implementation of "Education & Training 2010" work program and "Improvement Education of teachers and trainers", 2003), performing previous preparatory work, analyzing the situation at EU level through study visits. The various dimensions at national level were identified and reflected in different qualification networks, such as the BG national one. As the VET professionals are admitted as an important source of subject knowledge, the following basic requirements within the concept for the „changing the role of the teachers/trainers from training to learning" are said in "Education and Training 2010" work program (Education and Training 2010 program; Cluster 'Teachers and Trainers' - Main policy conclusions 2005 - 2007; http://ec.europa.eu/education/policies/2010/doc/reportpeer5_en.pdf):

improvement of subject competence and links between theory and practice, as well as use of learner-centered approach. In this respect, the project Bio-FIT goals are to enhance the quality of education and professional development of VET professionals; to improve the quality of their competence and skills, to establish the links between theory and practice; and to apply the learner-centered approach. They will be reached through a competence-based e-learning system, structured as learning outcomes, assessed through ECVET principles at national/European level. This include building up of structured model in respect to EQF reference levels 5, 6, 7; selection of mix of learning methods and specific content and set up of multilingual e-platform to innovative VET professionals' education. The up-to-date methodological strategy is designed for refreshment of trainees' skills and ability of short- and long-term beneficiaries. The impact is grounded on the development of flexible basis for continuing education with quality enhancement in respect to the national VET requirements as well as on the introduction of a system for teachers/trainers' qualifications validation. Thus, the Bio-FIT project will contribute for the partners' national VET system development in compliance with the EU standards and will raise the territory network formation.

- To follow this, the next considerations concerning different Bio-FIT target groups are taken into account:
 - The **VET teachers/trainers** competence requirements are changing. They are becoming more directly involved in curriculum planning, often in cooperation with enterprises in its development and design. As in most

European countries, in Bulgaria this process is decentralized and to support VET teachers in exploiting the opportunities of their new role in more decentralized VET system, the following measures are necessary: focusing of VET teachers/trainers efforts towards work places; integrating their knowledge into curriculum development grounded on well-developed relations with relevant enterprises; development of clearer professional profiles of VET teachers/trainers that have to take care for their own professional development.

- The **company trainers** are developing good partnership with training settings. The application of modern didactic principles in work-place settings is a mission for all enterprises that seek to maintain sufficient inflow of well-trained workforce. There are gaps and challenges to be bridged through establishment of close professional relationships with VET teachers; encouragement of company trainers to strengthen their pedagogical and didactic competences in order to increase the attractiveness of VET.
- **VET managers** are responsible to ensure that VET teachers/trainers are aware of the opportunities and challenges of education. VET managers have to understand the new and emerging requirements for VET teachers and establish the necessary conditions to maintain their central role in curriculum development, to encourage teamwork and working relationships with company trainers. Common CVET of VET teachers and company trainers should be organized to promote cooperation and establishment of shared approaches and methods.
- The **social partners'** interaction with the VET system. The provision of good (C)VET is dependent on interaction with social partners and integration of theory, practice of work-based learning, company needs, requirements and perspectives into learning.
- Involvement of **VET policy makers** at EU/national level. The trend in (C)VET is towards increasing decentralization in respect to efficient adaptation to changes in employers' needs for skills and competences. Meanwhile, the structural economic development implies appearance of new skills and competence requirements.

3. Current status of training available in all project partner countries

3.1. Brief historical overview of agricultural education

Agricultural education in Bulgaria had 45 years tradition and experience. The first higher agricultural department in Bulgaria have been established in 1921 at Sofia State University. In 1936 Bulgarian Academy of Sciences was founded and thirteen years latter - the Higher Agricultural Institute with faculties of Agronomy, Zoo-technics, Veterinary Medicine. During this period agricultural education was concentrated on the developments of agronomists and zoo-technicians. In 1976 Bulgarian government decided to reform agricultural education and two new higher institutes were created – Higher Agricultural Institute in Plovdiv and Higher Institute for Zootechnics and Veterinary Medicine in Stara Zagora. The basic reason for this decision laid in the created big cooperatives and state farms and the subsequent need for separation of technological and management functions and the development of agricultural economics education as independent speciality. In the following years with the performance of the agrarian reform and establishment of new private farms new demands for introduction of innovative subjects and types of agriculture education emerge. At present Agricultural University – Plovdiv is the higher educational setting that acts as a national centre of agricultural business, science and education in Bulgaria with the corresponding social acknowledgement. Its main mission is:

- To provide high quality student-centered education guaranteeing competitiveness on the Bulgarian, the European and the world labour market;
- To achieve research results ensuring their rapid introduction into practice;
- To bring up citizens committed to civic virtues, capable of making policies and strategies in the agricultural sector;
- To preserve the traditional love of Bulgarian people to land and its richness, their desire for knowledge and the values of Bulgarian agricultural education and science.

Nowadays, the agricultural education is a government policy implemented through the integrated activities of the Ministry of Education and Science, the Ministry of Agriculture and Food, the Ministry of Labour and Social Policy.

3.2. Formal/non-formal education in bio-fertilizers: available training programmes; responsible organizations; training settings and systems; tendencies and problems

3.2.1. Structure of Agricultural Education in Bulgaria

Higher education in Bulgaria

Legal framework:

- The Constitution of the Republic of Bulgaria (1991)
- Law of National Education
- Higher Education Act (1995)
- Government Ordinance on the State Classifier of the fields of study and subject fields (2002)
- Government Ordinance on the State Requirements for the degree qualifications of Bachelor, Master and Specialist (in specific professional field) (2002)
- Government Ordinance on the State Requirements for the content of the documents issued by higher education institutions (1997)

Coordinating bodies:

- The National Assembly
- The Council of Ministers
- The Ministry of Education and Science
- The National Evaluation and Accreditation Agency (NEAA)
- The National Information Center for Academic Recognition and Mobility
- The Center for Control and Assessment of the Quality in Education
- Rectors' Conference of the Republic of Bulgaria

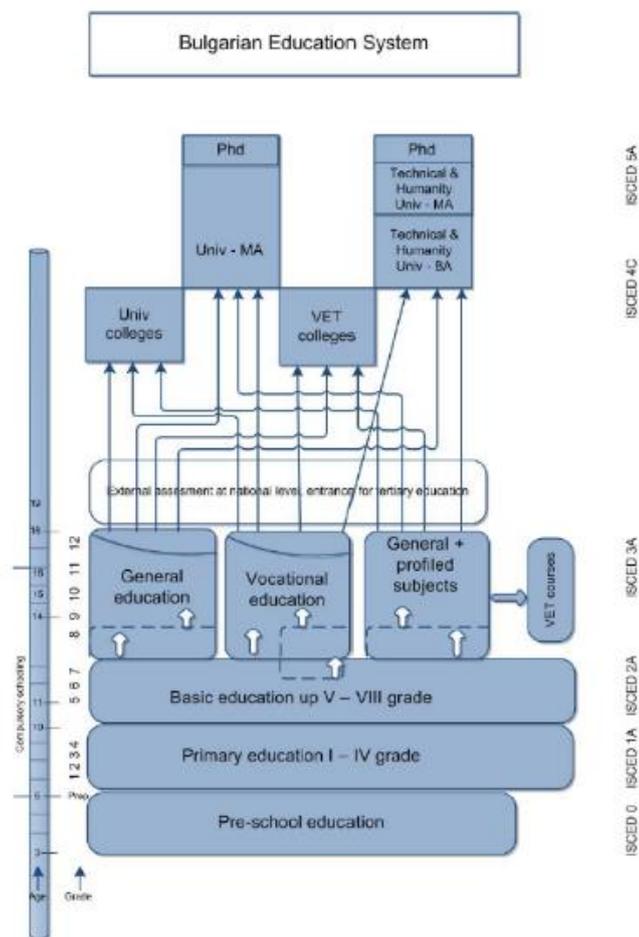
Higher education institutions:

There are 37 public (25 universities, 11 specialized higher schools and 1 self-contained college) and 14 private higher schools (5 universities, 2 specialized higher schools and 7 self-contained colleges). according to the State Register of the Accredited Higher Schools in Bulgaria (Fig. 1). Agricultural education is offered by Agricultural University – Plovdiv, University of national and World Economy, Center for Agro-business and Agrarian regions development, University of Forestry, D. A. Tsenov Academy of Economics, Trakiya University - Stara Zagora, New Bulgarian University.

Types of higher education institutions:

- Higher Education College (non-university higher education institution)
- University
- Equivalent to Universities Specialized Higher Education Institution/Technical University
- Academy

Fig. 1. Educational system in Bulgaria and degree structure of the higher education (Source: ReferNet report <http://www.cedefop.europa.eu/en>)



Vocational Education and Training in Bulgaria

Vocational Education and Training is a national priority. It aims at providing equal approach to education, high quality of lifelong learning and establishing of connection between education and realization at labour market.

Legal framework:

According to the Constitution of the Republic of Bulgaria, the state creates conditions for organization and conduct of vocational education and training. The legal framework encompasses the following acts:

- The Constitution of the Republic of Bulgaria (1991)
- Public Education Act (1991)
- The Act for Educational Level, Educational Minimum and Curriculum State Educational Requirements /Standards/
- Vocational Education and Training Act (1999)
- Recognition of Vocational Qualification Act (2008)
- The Labour Code (2001)
- The Employment Promotion Act (EPA) (2006)
- The law for recognition of professional qualifications
- The Law on culture protection and development (1999)
- Cultural Centres Act (1996)
- The Crafts Law (2001)
- National Lifelong Learning Strategy 2014-2020
- National strategy for Continuing Education 2011–2015

The main VET providers are VET schools (VET secondary schools, art schools, sports schools), VET colleges and licensed private and public continuing vocational training (CVT) centres.

Institutions in Vocational Education and Training System

- Vocational schools
- Vocational gymnasiums
- Vocational classes in the primary and secondary schools; evening schools
- Vocational collages
- Art and sport schools
- Vocational training centers
- Centers for qualification of teachers and trainers
- Public and municipal centres for information, professional guidance and counseling
- Non-government organizations which provide non-formal trainings in various fields.
- Framework programs regulate acquisition of VET qualifications by setting age and entry level requirements and specifying content and duration. There are six framework programs:
 - school-based initial VET (IVET) programs 'A' leading to first level VET qualifications (EQF 2);

- school-based IVET programs 'B' leading to second level VET qualifications (EQF 3). These programs give access to higher education (HE);
- school-based VET programs 'C' for second and third level VET qualifications (EQF 4), giving access to HE;
- school-based post-secondary non-tertiary VET programs 'D' leading to fourth level VET qualifications (EQF 5), offered by VET colleges;
- IVET programs 'E' (apprenticeships) offering by CVT centres. Initial VET (IVET) for persons over the age of 16 is organized in vocational training centers, vocational colleges, vocational schools, vocational gymnasiums, art schools and sport schools. Equal access to IVET is guaranteed by common access requirements for state-owned and municipal VET schools.
- CVET programs 'F' updating or broadening professional qualifications and/or leading to first, second or third level VET qualifications. Continuing VET in Bulgaria is defined as training to be delivered to persons over 16 years, which are no longer in the formal education system. It addresses either employed or unemployed. CVET is organized through courses in vocational gymnasiums, art schools, sport schools, vocational training centers and vocational colleges.
- At formal education level Agricultural Education (AE) in Bulgaria is organized in compliance with the Higher Education Law and the state requirements for accreditation of the specialities in Area: 6.0 – Agro-science and Veterinary Medicine. It is performed through Bachelor and Master degree programmes, the latter being oriented towards the general scientific and training fields of the relevant university offering them.

However, several Bulgarian universities have their own open-education, or continuing education centres, in which AE is offered:

- The School of Distance, Online and Continuing Education in New Bulgarian University offers education in programmes and courses for qualification and requalification, master classes, and preparatory courses for admission. The Centre also devises courses and programmes on demand.
- The Centre "Open and Continuing Education (COCE)" at the University of Architecture, Civil Engineering and Geodesy in Sofia organizes open and continuing education courses for professionals and students in new areas of science and environmental friendly technologies.

- The Centre of Continuing Education at the Agricultural University – Plovdiv provides lifelong learning possibilities for graduates, students, and other specialists to acquire key competencies in the areas of agriculture and ecology, economics and tourism.

The nongovernment sector, private companies and NGOs, foundations and associations offer distance courses in different areas, including agriculture, that aim to reach various target groups. The list of best practices includes:

- Licensed Vocational Training Centres (CPOs)
- In-service training, most often in larger enterprises
- German-Bulgarian Vocational Training Centres in operation since 1995/1996.
- Innovative Teachers Network, with more than 20 000 Bulgarian teachers.
- Znanie Center for Vocational Training

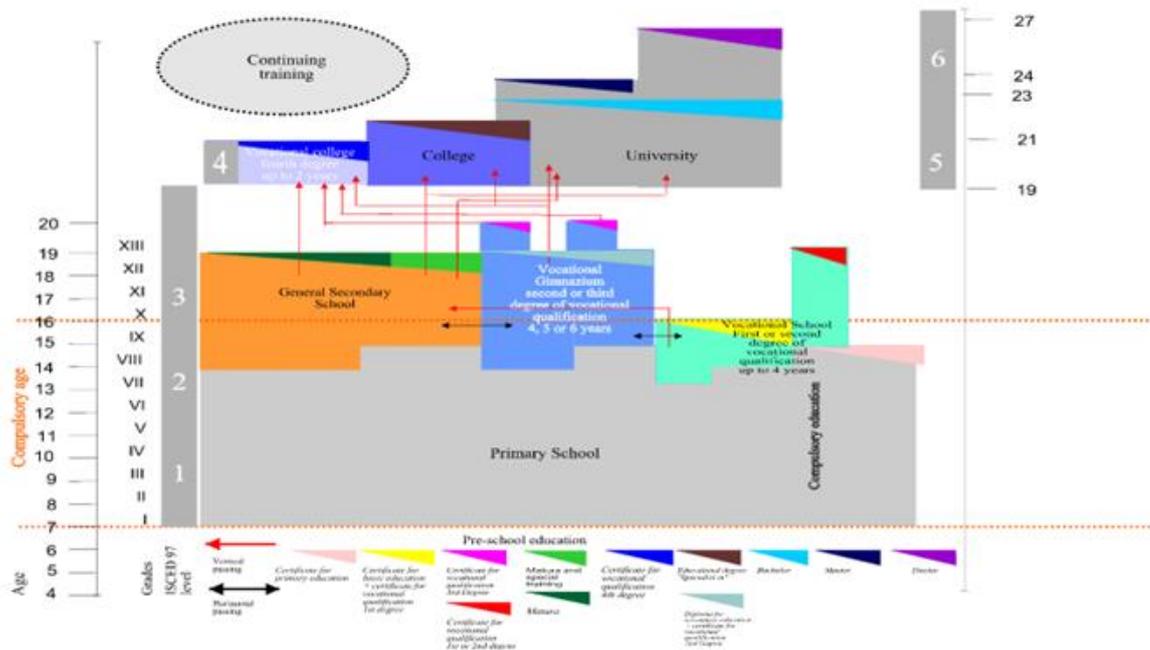
Coordinating bodies:

- The National Assembly
- The Council of Ministers
- The Ministry of Labour and Social Policy
- The Ministry of Education and Science
- The National Evaluation and Accreditation Agency (NEAA)
- National Employment Agency (EA)
- National Agency for Vocational Education and Training (NAVET)

As regards the VET in Bulgaria, it is implemented through the integrated activities of the Ministry of Education and Science and the Ministry of Labor and Social Policy. The Ministry of Education and Science carry out the national policy in the field of education and science; organizes the development and the implementation of the national educational programs as well as implementation of the national policy for qualification and career development. The Ministry of Labor and Social Policy participates in the implementation of the state policy on vocational education and training by identifying the needs of vocational education and training through analyzing trends in the labor market. On the other hand, the National Agency for Vocational Education and Training (NAVET) is a national authority to the Council of Ministers, which is responsible for licensing of activities within the vocational education and training system, as well as for coordination of the institutions related to vocational guidance and vocational education and training.

Fig.2 Structure of VET (Source: Ministry of education, youth and science - Bulgaria

<https://www.mon.bg>)



3.2.2. Specifics of Bulgarian VET

Bulgarian VET system is characterized with several specific peculiarities:

- Possibilities for VET are equally assured for trainees, which is based on the common programs and national educational standards that regulate vocational qualifications.
- VET schools have the opportunities to use their capacity and facilities not only for training young people but also for all other types of trainees.
- Municipalities played important role in VET through participating in VET policy implementation (training its own staff, offering vocational guidance and training, training the unemployed and others, providing the necessary equipment and financial support for VET providers and guidance centres).
- National educational standards for VET qualifications at all levels are competence-based.
- Possibility to directly involve professionals in VET. Staff teaching VET subjects only need a higher education diploma in the relevant subject.
- Flexibility in involving industry professionals in order to make VET more attractive and relevant to labor market.

3.2.3. Trends and problems

Bulgaria has already accepted a concept for the development of a national programme for VET. This concept was developed, yet not fully implemented, by the Ministry of Education and Science, the Ministry of Labour and Social Policy, the Ministry of Justice and Legal Integration in Europe, Universities, the Federation of Societies for Spreading of Knowledge, Federation of Scientific and Technical Unions, Chamber of Trade, trade unions and vocational schools.

The concept creates conditions for the establishment of the national system for VET in cooperation with social partners with the following aims:

- Establishment of social and economic reforms corresponding to the opportunities for VET in Bulgaria;
- Raising the educational level of the population;
- Extension of access to different educational forms;
- Co-operation with social partners at the national, regional and local level;
- Extension of public support for VET.

Since lifelong learning is one of the channels through which VET can be widespread, a wide variety of existing educational possibilities is presenting to the wide audience with special emphasis on informative and non-formal learning. Moreover, the public attention is drawn on questions concerning educational problems by the motto 'The education is for every person', and, finally, the exchange of ideas and the partnership between experts, NGOs, and ministries is encouraged.

The concept is linked with the important strategic documents at national level covering the School and Pre-School Education Development, Strategy for Introducing ICT in the Bulgarian Schools, the National Further Vocational Training Strategy, the Employment Strategy, as well as the Human Resources Development Operative Programme (2007-2013).

4. Alignment with National/EU VET training priorities (implementation of EQF/NQF and ECVET)

A distinctive feature of Bulgaria's lifelong learning strategy is its comprehensive approach to encompass all areas of learning: from pre-school education and training to continuing adult training.

The innovative solutions for training of VET providers encompass development and enrichment of a system for career guidance through offering conditions for adoption of career planning skills. Here, encouragement of the access of „non-conventional” trainees through alternative forms of lifelong learning at the universities is also foreseen to ensure opportunities for non-formal and informal learning that offers personal and professional progress.

4.1. Bulgarian national qualifications framework for lifelong learning (BQF)

The Bulgarian national qualifications framework for lifelong learning (BQF) was officially launched with Decision No 96 of 02/02/2012 of the council of ministers. Further, in 2013 BQF was referenced to the European qualifications framework (EQF) and self-certified against the qualifications framework of the European higher education area (QF-EHEA)²⁷.

BQF is considered as an important national priority and mandatory precondition for implementing the EQF. Hence it is included as a pillar of Bulgarian government educational policy in the programme for European development of Bulgaria (2009-13).

The BQF is a comprehensive, nine-level framework (incl. a preparatory level 0). It encompasses qualifications from all levels and subsystems of formal education and training, i.e. pre-primary, primary and secondary general education, vocational education and training (VET) and higher education.

4.2. Development and introduction of BQF

In the context of BQF development the efforts of the educational policy makers in Bulgaria were concentrated on two objectives:

- to make the levels of the national education system more transparent and clear to comprehend, and hence – to make mobility and recognition of qualifications easier
- to implement of set of tools to describe them in terms of learning outcomes.

The specific aims addressed by BQF development are to:

- develop a device with a translation and bridging function;
- encourage mobility in both education and labour market;
- stimulate adoption of learning-outcomes based qualifications;
- support validation of prior learning, including non-formal and informal learning;
- strengthen orientation towards a lifelong learning approach;
- increase cooperation between stakeholders.

Apart from offering transparency, the NQF is seen as an important tool supporting national reforms and needs, for example, setting up a system for validating non-formal learning, improving education quality, modernising curricula and strengthening provider accountability. The BQF aims to play an important role in supporting lifelong learning and in promoting participation of VET in Bulgaria.

4.3. Prospects for implementation of BQF

BQF's implementation is coordinated by Bulgarian Ministry of Education and Science with an NCP appointed at the international and European cooperation directorate in this ministry.

The actual implementation of BQF is preceded by a currently going on referencing process that will result in issue of new qualification certificates, diplomas and EUROPASS documents coherent to the relevant BQF level and linked to the corresponding EQF level. At present, this is foreseen for the 2015/16 school year, accompanied by the necessary legislative changes.

An important goal of BQF implementation is to assure support to lifelong learning. Since BQF encompasses all educational stages: from pre-primary to doctoral, it can be regarded as a comprehensive framework. However, it must be pointed out that at present it is restricted to the qualifications awarded upon completion of formal education and training. In addition, levels 6 to 8 are restricted to qualifications adopted by higher education. These restrictions impose the future prospects for BQF development in the light of its establishment as a lifelong learning supporting instrument that facilitates the access, progression and participation of all learners in education outside the formal education system.

4.4. BQF structure

The BQF comprises eight levels with an additional preparatory level (the so called NQF level 'zero', encompassing pre-school education).

For description of these levels the EQF and QF-EHEA descriptors have been taken into consideration. The levels descriptors differentiated between personal and professional competences and cover:

- knowledge, both theoretical and factual;

- skills, both cognitive and practical;
- wider competences.

The qualification levels are Learning-outcomes-based. The anticipated learning outcomes for a defined qualification level reflect the legal documents that govern the various national subsystems of education and training on the one hand and the approved educational requirements about content of the learning material in general education, and VET.

To emphasize on the important role of learning outcomes in planning education, in 2011, a draft model of a new VET standard (the State educational requirement for acquisition of vocational qualifications for professions) was elaborated in compliance with the principles and the characteristics of EQF and ECVET. It is linked to the structuring of the learning outcomes into units and is an obligatory prerequisite for setting up a validation system and updating VET curricula. These latter are important priorities of Bulgarian educational policy.

4.5. BQF for validation of non-formal and informal learning – referencing to EQF

Bulgaria has delivered a joint referencing report in early 2013, referencing the BQF to the EQF and the QF-EHEA. In the BQF VET covers levels 2 to 5. It starts at the age of 13 and is placed at level 2, along with the basic education certificate. Levels 3 and 4 comprise lower and upper secondary stages and include the 'second and third level of a vocational qualification, along with general education. Level 5 comprises VET only; the 'fourth level' of a vocational qualification is placed here. This is the most advanced (post-secondary) vocational qualification.

4.6. European Credits System vs. national grading systems

One of the main VET national priorities for Bulgaria is concentrated on improvement of the links between VET and the world of labour and on the support of integration in the VET system of less favoured groups. To reform the existing VET system a coherent national approach is developed comprising implementation of all EU-VET instruments: EQF, ECVET, ECTS, EQARF, Europass. Among them ECVET plays a key role since it enhances the transnational VET mobility of the individuals and encourages the active European citizenship.

The Renewed Employment Strategy 2008-2015 and National Action Plan on Employment 2012 postulate as its priority the creation of a system for accumulation and

transfer of credits in vocational education and training, which will stimulate people to take part in and employers to organise training. Guidelines for Users of the European Credit Transfer System in Vocational Education and Training are also under development (ECVET Guidelines). They are directed at providers of vocational education and training.

There exist several important prerequisites and initiatives for ECVET implementation. They can be summarized as follows:

- launched NQF/BQF referencing the four VET levels to EQF levels 2 – 5
- published list of professions comprising all existing national qualifications with defined vocational areas, levels, and codes;
- specified learning outcomes-oriented national VET standards with specified criteria and indicators for assessment of the learning outcomes
- updated legal frame: amended and supplemented VET Act
- set up NCP for ECVET implementation - the NAVET
- In the course of ECVET implementation several important considerations are taken into account:
 - the need of transparency of assessment procedures, indicators and criteria
 - the need of appropriate assessment procedures in the context of transnational mobility;
 - the need to respect existing regulations/ requirements, i.e. national assessment systems;
 - the need to equip units of learning outcomes with feasible assessment schemes
 - the need of assessment that supports transparency and quality of learning outcomes descriptions

In 2011 a new revised model of a VET-standard based on ECVET principles was set out through revision of existing VET-standards from different vocational areas. The model was created using project results and discussed with social partners. It contains a set of units, each including learning outcomes described in knowledge, skills and competence, appointed NQF/EQF level and quality assurance assessment criteria. The new model will be applied for 20 pilot professions and will be the basis for new modular framework training curricula and modular training programmes for all qualifications in the IVET and CVET systems.

5. Assessment of the educational needs / gaps in the project subject area and presentation of a common frame on the existing needs for development of suitable e-training programme.

5.1. Selection of key qualifications for VET in the field of bio-fertilizers

The lifelong learning concept in the LLL Strategy is based on two major groups of competencies; acquirable either simultaneously or separately. These are the groups of 'professional competences' and 'key competencies'.

The professional competencies are related to the professional knowledge, skills and aptitudes applicable to a particular field of economic activity. Here knowledge and understanding, intellectual skills and professional skills are included. The state education requirements (SER) for the acquisition of qualification in professions determine the obligatory professional competencies which should be mastered during the practice training. The SER are defined per professions from the List of Professions for VET. They are obligatory for all training institutions authorised to organise vocational training and comprise:

- Requirements on the minimum qualification and admission level
- Description of the profession – labour activities, responsibilities, personal characteristics, specific working conditions, equipment and instruments
- Possibilities for continuing vocational training
- Possibilities for professional realisation in compliance with the National Classification of Professions and Positions
- Training objectives – general compulsory vocational training for all professional areas; sector compulsory vocational training for all professions from the professional area; compulsory special professional vocational training

The key competencies or the so called general skills include those basic skills an employee may need in a variety of situations (e.g. communication skills, skills for working with ICT, team working, self-training, etc.).

The professional development and the improvement of the quality of VET providers, is recognised as a priority at European level. However, at national level the competences needed to fulfil the professional tasks in VET are in process of specification, mainly because of the education reforms and new approaches to teaching and assessment that are currently going on in Bulgaria. The situation is even more complicated since relevance between the provision of VET in Bulgaria and the needs of the labour market must be reached. This

means implementation of systems and mechanisms at national level to identify the current requirements for skills and knowledge in different sectors, occupations, education level. In the LLL Strategy 2014 – 2020 development and implementation of the two mentioned above groups of competences is envisaged to satisfy both the EU requirements and the institutional and regional levels peculiarities.

5.2. Building up of competence-based system for sectoral qualification

The scoping study indicated that the organic farming management roles, and therefore training and education requirements, were likely to vary across different areas in the country. Therefore, it was decided to develop a series of investigation of qualification characteristics on the basis of ISCO. The results from the above mentioned analysis indicate the existence of a social call for more subject knowledge competencies, linked to the learning processes and to curriculum outcomes, less connected with the subject provided by the educational settings. Such an opportunity is proposed by the innovative BioFIT project – a competence-based e-learning system, structured in the light of learning outcomes, evaluated through ECVET principles and envisaged for ex-post accreditation and quality enhancement of VET system at national/European level.

Surveys were developed for the chosen target groups in respect to the preliminary selected BioFIT sector specific professional areas as follows:

- VET trainers in GAP
- VET trainers in Microbiology
- Farming advisers
- Agricultural inspectors
- Production managers in agriculture
- Policy makers in agriculture
- VET Trainer in Chemical Engineering
- Agronomists
- Vocational guidance counsellor
- Careers advisers

A competence package development is laid down, which represents a competence map for each BioFIT target VET professional in the project sector. Thus, elaboration of a competence standard procedure assuring international transfer of acquired qualification along the project training is envisaged.

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