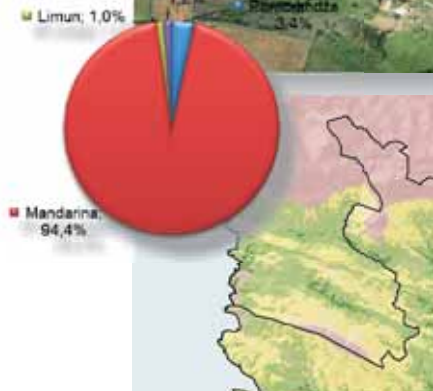


CAMP Montenegro

Assessment of attractiveness and suitability of the coastal zone of Montenegro for development of agriculture

Summary



Project commissioned by:

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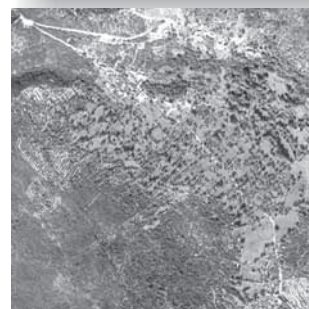
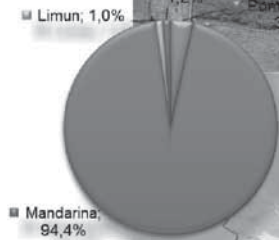
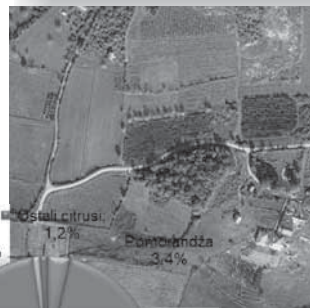
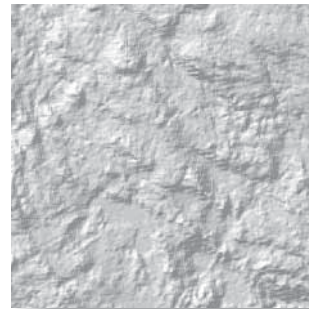
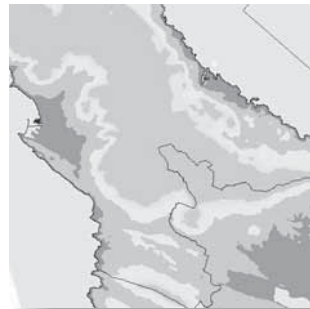


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List of Abbreviations

CAMP	Coastal Area Management Programme
CAP	Common Agricultural Policy
CARDS	Community Assistance for Reconstruction, Development and Stabilisation in the Balkans (EU)
CEED	Centre for Entrepreneurship and Economic Development
CEFTA	Central European Free Trade Association
E	East
EU	European Union
GDP	Gross Domestic Product
GIS	Geographic Information System
GUP	General Urban Plan
ICZM	Integrated Coastal Zone Management
IPA	Instrument for Pre-accession Assistance
IPARD	Instrument for Pre-accession Assistance for Rural Development (EU)
ISPA	Instrument for Structural Policies for Pre-Accession (EU)
MAP	Mediterranean Action Plan
MIPA	Montenegrin Investment Promotion Agency
MNE	Montenegro
MONSTAT	Statistical Office of Montenegro
MonteCEP	Centre for Urban Development Planning of Montenegro
MSDT	Ministry of Sustainable Development and Tourism
MSP	Municipal Spatial Plan
N	North
NE	North-East
NLS	National Location Study
NW	North-West
PAP/RAC	Priority Actions Programme/Regional Activity Centre
PHARE	Poland and Hungary: Assistance for Restructuring their Economies
PTT	Postal, Telegraph and Telephone Services
RIUDP	Republic Institute of Urban Development and Planning
S	South
SAPARD	Special Accession Programme for Agriculture and Rural Development (EU)
SE	South-East
SP MNE	Spatial Plan of Montenegro
SPSPCZ MNE	Special Purpose Spatial Plan of the Coastal Zone of Montenegro
SUP	Spatial Urban Plan
SW	South-West
UN	United Nations
UNDP	United Nations Development Programme
VAT	Value Added Tax
W	West
WTO	World Trade Organization

Agricultural sector plays an important role in Montenegro's economy, with a growing share in gross domestic product which reached the level of 8% in 2011. Even though nowadays only 1.28% of the total number of employed persons in Montenegro works in agricultural sector, there are 46,473 annual labour units in family agricultural holdings (each unit being equivalent to a permanently employed person) which leads to a conclusion that the actual share of employment in agriculture amounts to almost 30%. Difficulties encountered in agricultural development are related to the excessive imports and a number of reasons that have led to economic stagnation in the earlier period. Balanced development of a country such as Montenegro requires clearly defined role of agriculture and support to its development since there can be no regional and rural without agricultural development.

2.

Purpose and Contents of the Attractiveness and Suitability Assessment

The assessment of attractiveness of the coastal zone for agricultural development forms foundation for preparation of the Special Purpose Spatial Plan for the Coastal Zone of Montenegro (SPSPCZ MNE), as well as for the National Strategy for Integrated Coastal Zone Management of Montenegro and its Action Plan. Results of the assessment may also be used in

preparation of municipal plans and strategic documents in the field of agriculture. In a methodological sense the purpose of this study is to show how (spatial) assessment of attractiveness and suitability of the coastal zone is prepared by using Geographic Information System (GIS).

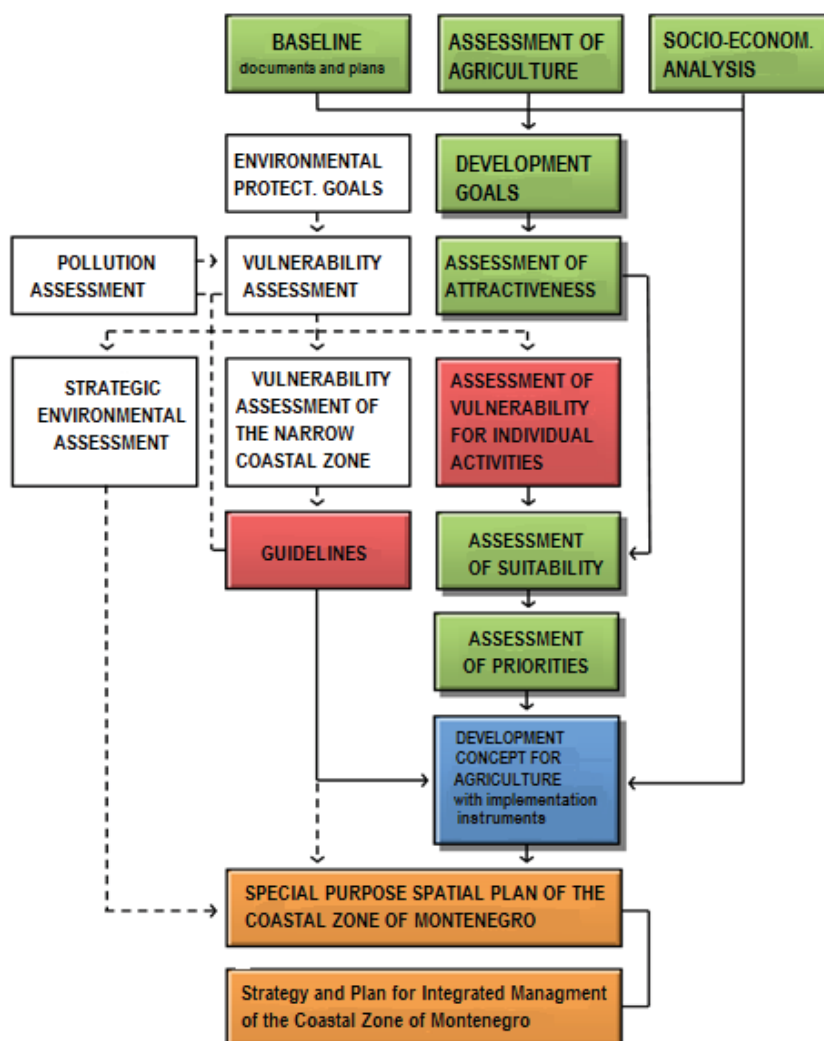


Figure 1: Schematic overview of the Assessment of Attractiveness and Suitability of the Coastal Zone of Montenegro for Development of Agriculture in the framework of CAMP Montenegro and its relation to other activities and documents

Baseline for the Attractiveness and Suitability Assessment

Despite limited areas used for agricultural production, Montenegro's agriculture is diverse and the same can be said for the coastal region. The most suitable and largest areas for agriculture in the coastal region are ameliorated coastal fields: Ulcinjsko (100 ha), Zoganjsko (110 ha), Mrčevo (220 ha), Tivatsko (80 ha) and Sutorinsko (120 ha), with a total surface of 640 ha. Unfortunately, majority of these areas are either not used or are used to a small extent, while some of them are even derelict. Štojska greda, which is located in the hinterland of Velika plaža (1,000 ha), represents considerable potential.

Suitability of the Mediterranean climate for growing olives, figs, citrus fruits, diverse vegetables, flowers and other agricultural crops attractive for the market is one of the basic development potentials, primarily for rural hinterland. Agricultural potential of the coastal zone is also linked to ecological and organic farming since low levels of mineral fertilisers (over 10 times lower consumption compared to the EU average) and plant protection products are still applied in Montenegro. Linking the tourism sector with agriculture represents major potential for increasing the employment levels and income in the coastal region, primarily through production of the food for consumption in hotels, restaurants, etc. Agriculture also has an important national-cultural function which includes preservation of tradition and cultural heritage in the countryside.

Despite these opportunities, one of the main characteristics of food production in Montenegro is that the share of primary agriculture in Gross Domestic Product is higher

than that of the food processing sector. This indicates low level of finalisation of agricultural products, considerable share of self-supply of rural population with food and widespread marketing of agricultural products through unregistered sale channels.

Sustainable agricultural development may create suitable standard of living for rural population and ensure overall rural development, while preserving traditional values of rural life. Therefore, it is necessary to identify the scope of development opportunities for maintaining agricultural production in the coastal zone and to develop an integrated programme with other sectors, tourism in particular.

3.1 Legal and Strategic Frameworks

The analysis carried out by the Central Bank of Montenegro¹ concluded that progress was made with strengthening legal and strategic frameworks in agricultural sector. During the past period, the Ministry of Agriculture and Rural Development worked intensively to adopt key systemic documents, the most important ones being the Law on Agriculture and Rural Development (2009), National Rural Development Programme (2008), and the draft IPARD programme for Montenegro (2011 and 2012) which at the same time constitutes basis for receiving IPARD support (V component of IPA programme). The Government of Montenegro also adopted the Action Plan for the Development of Organic Farming 2012-2017

¹ Recommendations to the Government of Montenegro concerning economic policy in 2013

which sets out measures to support organic farming, as well as measures on processing of organic products and their consumption on domestic market and through tourism offer.

Agriculture (especially organic production) and available forest potential are resources that should be valorised on the market. As emphasised in the Regional Development Strategy of Montenegro 2010-2014, the largest share of development potential is in fact located in the least developed areas. In line with the goals and instruments of the EU Common Agricultural Policy (CAP), the National Agriculture and Rural Development Strategy of Montenegro 2007-2013 (Montenegro's Agriculture and European Union – Strategy for Food Production and Rural Development) has set preparation of agricultural sector for the EU accession through development of sustainable agriculture and rural areas as its general goal. The National Programme for Food Production and Rural Development 2009-2013 (adopted in November 2008) is an operational document for implementing the Strategy and for harmonisation of the overall agricultural policy of Montenegro with the EU Common Agricultural Policy. The new strategy for the period 2014-2020 is currently being prepared in accordance with the reformed EU agricultural policy. Moreover, in 2012 Montenegro became fully-fledged member of the World Trade Organization (WTO) which represents the broadest forum for conducting negotiations on liberalisation of international trade in all the segments.

In order to further strengthen agriculture and better harmonise Montenegrin rural development policy with the EU model, it is necessary to use all the funds allocated for strengthening of different segments of agriculture – from administrative capacities to the production and adoption of standards. Among others, EU funds from the Instrument for Pre-accession Assistance (IPA) are available, as well as funds from the IPARD programme which was submitted to the European Commission in 2013.

3.2 Treatment of Agriculture in Spatial Plans

3.2.1 Guidelines of the Spatial Plan of Montenegro for Agricultural Development

The Spatial Plan of Montenegro (SP MNE) by 2020 represents a strategic spatial planning document at the national level. According to the SP MNE, Montenegro only has 741 km² or 74,000 ha of agricultural land of better quality (5.4% of its territory), which indicates how highly important it is for the country. The most evident conflict between various land uses, which has been identified in the SP MNE as well, is the conflict between agriculture and urbanisation which is manifested in the trend of conversion of agricultural land. Land-use change and permanent loss of soil cause harm to agriculture and at the same time they give rise to other negative effects including soil erosion, environmental pollution, lowered values of cultural heritage and reduced attractiveness of certain areas. Inadequate socio-economic position of agriculture and rural areas still prevails. This is primarily reflected in low budget allocations and low total investments in agriculture and rural development.

As a result of slow development and modernisation, competitiveness of Montenegro's agriculture is low. Export of agricultural and food products is also low, while import is on the rise (export accounts for merely 12% of import) leading to continuous increase of high foreign trade deficit. On the other hand, as a result of low level of investments and insufficient care for land protection and development, considerable areas of fertile land are exposed to floods, bogging and salinization. The situation is similar when it comes to protection against erosion, torrents, provision of irrigation, re-cultivation and amelioration of new areas.

The basic *principles* set by the SP MNE are development of agricultural activities as the main and/or additional source of income for rural population in order to reverse the negative trend of declining numbers of inhabitants, development of organic farming in various agricultural areas, and development of processing capacities in the areas with primary agricultural production in order to strengthen the value chain and generate new added value. The main *goal* of the SP MNE is strict preservation of the existing potential of agricultural land, particularly of that located nearby urban settlements (peri-urban zones). The main potentials in the coastal zone refer to large sections of fertile agricultural land, areas with traditional agricultural production of the Mediterranean type, zones that are not used for military purposes any longer, and zones with traditional countryside ambient in the hinterland where agricultural activities are still practiced.

3.2.2 Analysis of Municipal Spatial Plans in the Coastal Zone

The entire territory of the **municipality of Budva** may be seen as a specific area in a sense that tourism functions in the arrangement of space prevail over the agricultural ones (0.8% of agricultural in total employment). Nevertheless, the Spatial Plan of the municipality of Budva envisages protection of agricultural land from unsound land take for construction, recreational and other non-agricultural purposes by calling for appropriate project documentation development.

Terms of Reference for the Municipal Spatial Plan (MSP) and General Urban Plan (GUP) of Tivat and guidelines of the SP MNE identify agriculture as a priority area in the development of this municipality. However, in the **municipality of Tivat** only less than 1% of the total number of the employed work in agricultural sector at the moment. Intensifying agriculture, as an activity which is complementary to tourism, has not occurred and major part of agricultural land is nowadays non-functional and derelict.

Development in **Herceg-Novi** area should be based on its comparative advantages. It is necessary to develop agricultural activities as the main or additional source of income for rural population in order to reverse negative trend of depopulation of the hinterland. Improvement of organic farming in different agricultural areas and development of capacities for processing agricultural products are also extremely important.

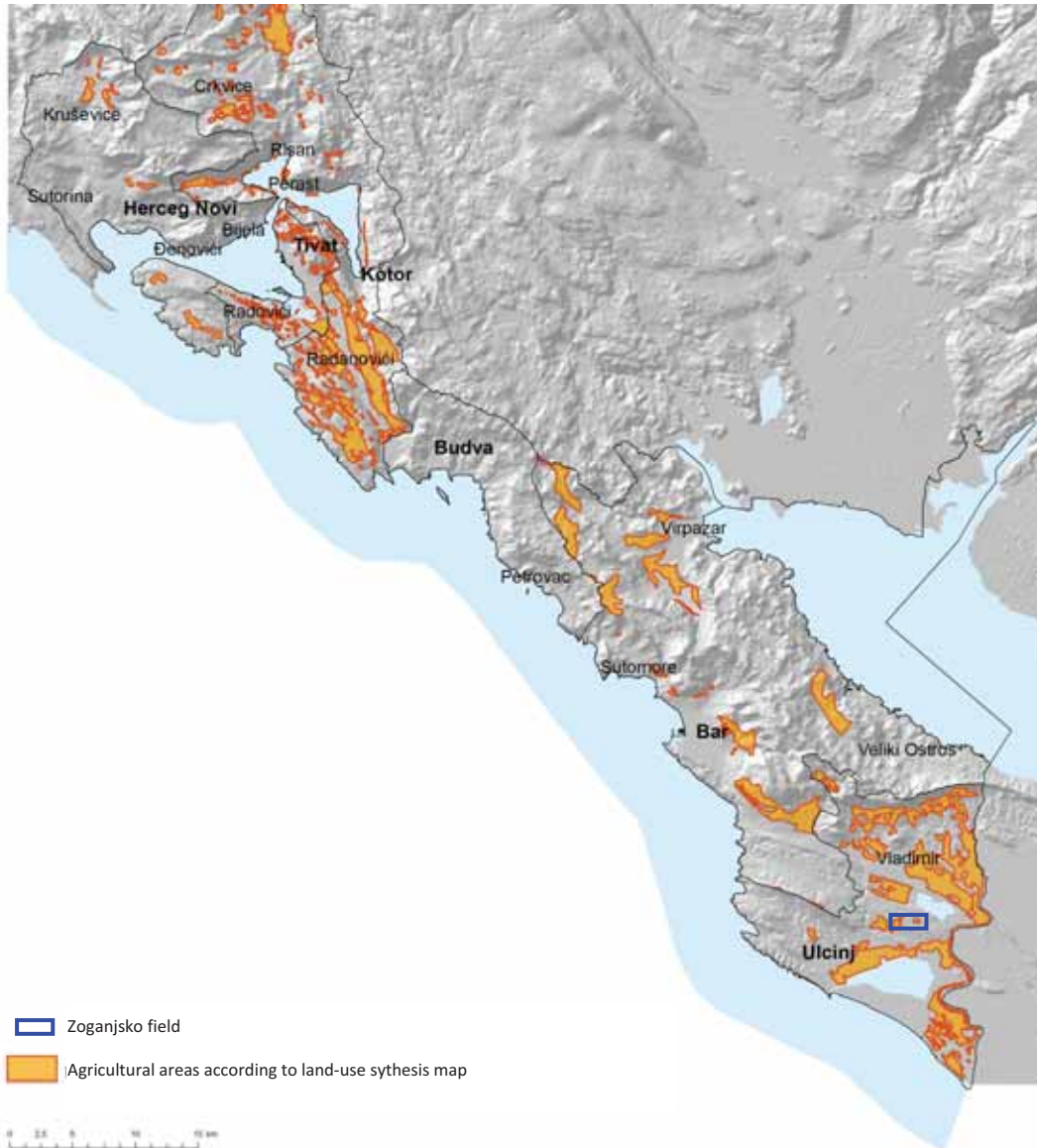
Guidelines on agricultural development laid down in the Spatial Plan of the **municipality of Kotor** are as follows: "According to the pedological analysis, the soil from categories I to IV should be fully preserved and used for agricultural purposes. Since the soil from these quality categories is located mainly in Grbalj, it is necessary to make correction to the urban plans and shift further construction towards peripheral areas of the fields (particularly at Radanovići)."

Different from other coastal municipalities, **Bar and Ulcinj** are recognised for their outstanding agricultural potentials. Three vegetation belts were established as a result of favourable climate: the first belt extending to the altitude of up to 300 m where olives, figs, citrus fruits (tangerines, oranges, lemons), almonds, kiwi, etc. prevail. In the second vegetation belt chestnut, pomegranate and grape vine grow, while varieties found in the third one include pears, apples, plums, etc.

Attention should be paid to the fact that the extent and distribution of agricultural land shown on the land-use synthesis map (Map 1) prepared for the development of the SPSPCZ MNE (RIUDP, July 2013) does not correspond with actual conditions. A considerable number of large sections of the existing agricultural areas, and particularly small coves and terraced agricultural areas for which this assessment also showed high attractiveness for agricultural development, are depicted as category of forests, makia, karst and other undeveloped areas in the synthesis land-use map.

The second problem is the way in which rural settlements are defined in spatial plans. The land-use category entitled *mixed use areas* in fact encompasses a large share of the

surrounding agricultural land which inevitably leads to fragmentation of agricultural land and to dispersed construction.



Map 1: An overview of agricultural areas according to land use (Land-use synthesis map, RIUDP, July 2013)

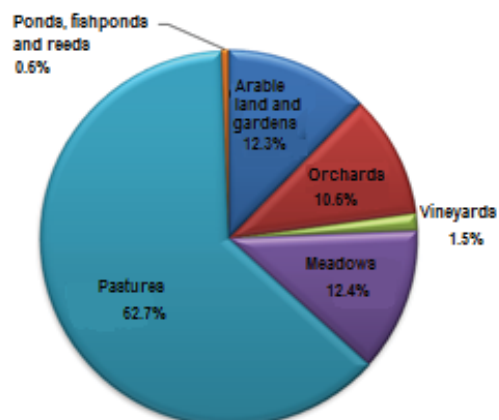


Figure 2: Typical example of agricultural areas (Zoganj) which are not defined as agricultural land in the land-use synthesis map (Source: Google Earth, 2013), marked with blue box in the Map 1.

The coastal region² coincides in general with the extent of the coastal zone and covers the area of 1,591 km² or 11.5% of the territory of Montenegro. It is suitable for fruit (citrus fruit and olives) and vegetable production. Its hilly terrains are suitable for small ruminants breeding and they are also abundant with honey-bearing, aromatic and medicinal herbs, as well as with wild fruit species (pomegranate, fig, etc.).

The structure of agricultural land of the coastal region is presented in the Chart 1, while agricultural areas are presented in the Map 2 below.

Chart 1: Structure of agricultural land in the coastal region in 2011. Source: Statistical Yearbook 2012, MONSTAT (www.monstat.org)



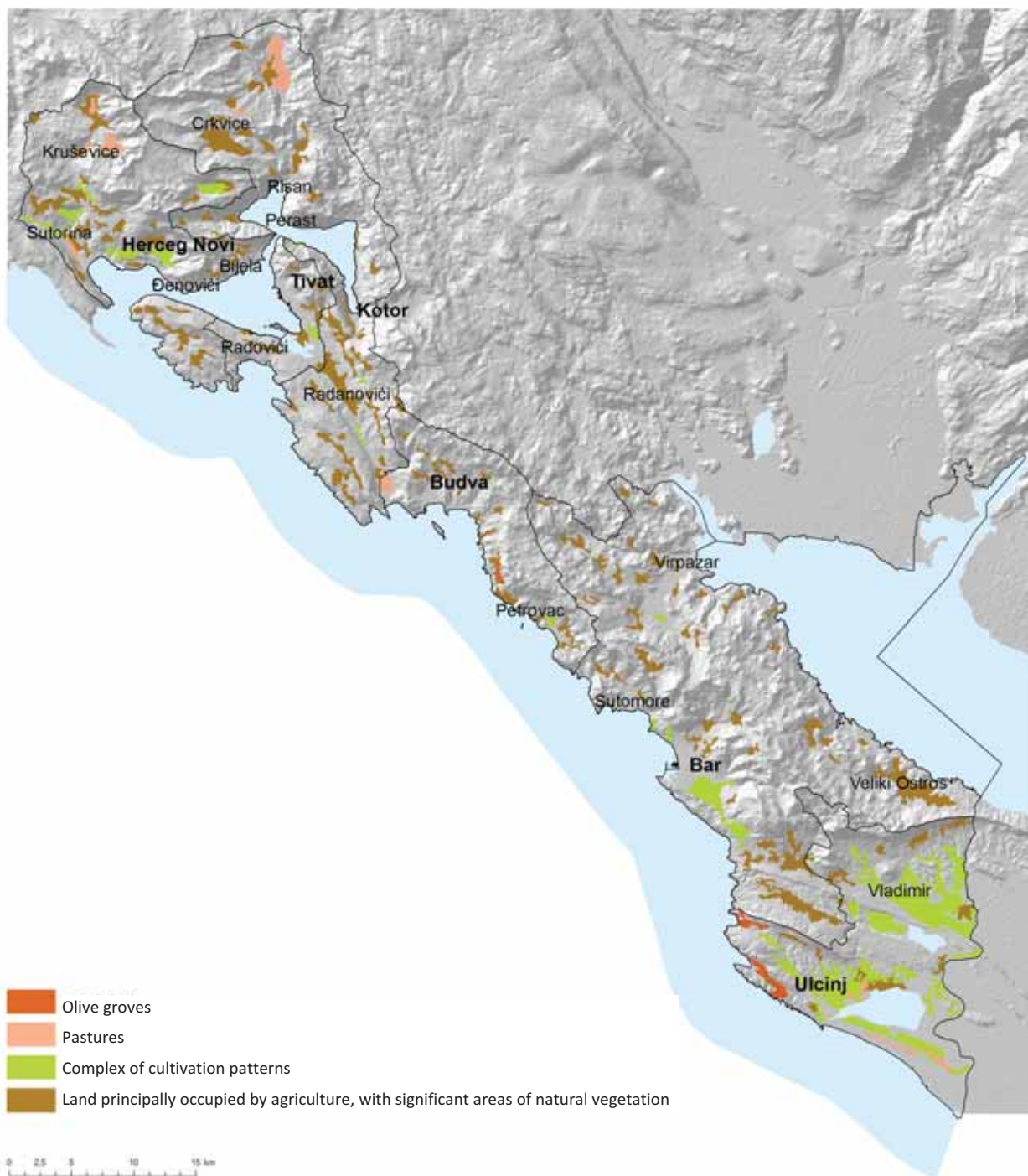
² Coastal region of Montenegro comprises six municipalities and their settlements, the municipality of Bar being the biggest (with the surface of 598 km²) and the municipality of Tivat the smallest one (46 km²). The remaining four municipalities of the coastal region are: Herceg Novi (235 km²), Kotor (335 km²), Budva (122 km²) and Ulcinj (255 km²). When it comes to territories, there is a small difference between the scope of the coastal zone and that of the coastal region. The coastal zone does not include a part of territory of the National Park Lake Skadar which belongs to the municipality of Bar (and thus to the coastal region), nor does it include a small part of settlements Pobori, Markovići and Brajići which belong to the National Park Lovćen while at the same time belonging to the group of settlements of the hilly and mountainous hinterland of the municipality of Budva.

As much as 90.5% of agricultural holdings in the coastal zone are smaller than 2 ha, while more than 55% of them have less than 0.5 ha of used agricultural land. Coastal region has just 2.1% of agricultural holdings the size of which is 5 ha and more, while as few as 0.1% (9 holdings) is more than 100 ha in size. The widespread presence of small agricultural holdings slows down development of the commercial agriculture.

4.1 Plant Production

The following activities are dominant in plant production sector: vegetable production, followed by the production of grapes, potatoes, fruits and olives, while cereals production is at a low level. Small scale of cereal production is one of the specificities of Montenegrin agriculture that makes it different compared to even the neighbouring countries. According to the 2012 Statistical Yearbook, 12% of total agricultural land in Montenegro is used for plant production, whereas cereals and vegetable production account for 8.8%, and fruit and grape production for 3.2% of agricultural land. Total surface of land used for plant production decreased by some 4.1% in the period 2001-2010.

In the coastal zone of Montenegro, where 5,398 ha are covered with **orchards**, it is figs, lemons, oranges, tangerines and olives that are grown the most. Fruit production sector is quite fragmented. Considerable fluctuations in production over the years, resulting from limited technology of growing and fragmented production on family holdings are some of the main weaknesses in the fruit production sub-sector. Except for peaches, raspberries, strawberries and citrus fruits, the fruits are widely grown in family gardens without applying the agro-technical measures. Therefore, the yield is low and varies considerably from one year to another.



Map 2: Overview of agricultural land according to the Corine land cover classification

Competitiveness in fruit sector may be boosted by modernisation of agricultural holdings, better use of resources and labour force, introduction of new technologies and innovation, while strong focus should be placed on market-oriented producers. This requires establishment

of modern orchards by using seedlings of controlled quality.

Olive is the oldest sub-tropical variety on the Montenegrin coast and it is grown on one third of the total areas covered by orchards. In Montenegro, there is the potential for annual

production which exceeds 2,000 t of olive oil, while only 50% of this is put to use. Production of olive oil is far from meeting domestic needs: total value of olive oil export amounts to EUR 77,000, whereas the value of import is ten times higher. It is interesting to note that not a single business is registered for olive growing on larger plantations in the country.

Citruses (citrus fruits) – oranges, tangerines, lemons and others grown in the coastal region account for as much as 99.9% of the total production in Montenegro (the percentage refers to territory on which citrus are grown). According to the data from the 2012 Statistical Yearbook, out of the total number of citrus trees, 98.4% are located in the coastal region, while the share of this region in total yield is 98.6%. At both national and level of the coastal region, fruits are grown on highly fragmented holdings. It is necessary to invest in new facilities and renovation of the existing ones, as well as in modern equipment and capacities for production and processing after the harvest.

According to the MONSTAT data, areas covered by **vineyards** showed the tendency of growth in the period 2001-2012, particularly over the last five years. Among the grown species autochthonous vine varieties used for production of red (*vranac* and *kratošija* – red wine grape varieties) and white wines (*krstač* – white wine grape variety) prevail and account for more than 70%, while non-native varieties are present to a smaller extent. Unlike other agricultural sectors, the value of export is five times higher than the value of import. Improvement of the competitiveness of wine sector requires innovation and better use of resources by means of new vineyards and controlled seedlings, while it is also necessary to provide support to producers' initiatives to establish associations and undertake joint activities that include production and sale. Moreover, focusing production on specific and traditional high-quality products would make considerable contribution to the development of

horizontal integration between wine and tourism sub-sectors which would make tourism offer more attractive.

In Montenegro, a total of 45,748 ha are covered by **arable land and gardens**, of which 14% (6,270 ha) are located in the coastal region. According to the statistical data, the previous trend of reduction of arable land areas is now mitigated or even reversed. In the coastal region it is tomatoes, onions and pepper plants that are produced the most. The following are the main limiting factors in vegetable production: no land improvement measures and low fertility of soil, inadequate basic processing and preparation for sowing, inadequate selection of varieties and hybrids, unfavourable structure of plants, diseases and pests, unfavourable distribution of precipitation, climate stresses, as well as inadequate level of knowledge among agricultural producers.

According to the data collected in the 2010 agricultural census, the **total irrigated area** in the coastal region equals 720.8 ha (25% of total irrigated land in Montenegro). The most frequent irrigation source in the coastal region is ground water (47.1%) followed by water supply system and other sources (29.8%). Surface water is used as an irrigation source in 19.2% of cases, while surface waters found on the holdings themselves are the least used source (4%). Lack of natural water springs for irrigation in agriculture may be partly resolved by digging wells. In the rest of the coastal zone, irrigation water may be supplied by building reservoirs in which natural precipitation would be collected and used during the season of vegetative growth of plants and also during critical periods of fruit development. Within the scope of the coastal zone of Montenegro, irrigation system for agricultural land exists only in Tivatsko field. The irrigation itself has unfortunately stopped, however the system still exists even though it is run down. Development of irrigation systems is envisaged for the area of 14,420 ha in the coastal zone of Montenegro by 2021, which is

75% of total land potential suitable for irrigation in this amelioration area.

Future **priority investments** in plant production sector should be made at the levels of primary production and processing industry. In the primary production sector, support should be shifted towards investments in boosting competitiveness and implementation of standards and in particular towards the improvement of technology and management, restoration of fruit plantations, building protected areas (polythene and glass greenhouses) and support to the establishment of producers' organisations and groups. In terms of processing and market, support should be given to the investments aiming to boost competitiveness and implementation of the EU standards. Professional training, particularly in the area of growing new varieties and hybrids, production of seedlings, introduction of new technologies, etc. should play an important role in future support.

4.2 Livestock Breeding

According to the estimates, economic value of the livestock breeding sector accounts for some 50% of total agricultural production of Montenegro. **Cattle breeding** is the most important branch followed by (in economic terms) **sheep breeding**. **Goat breeding** is particularly important for the karst areas of Montenegro in which natural preconditions for breeding other types of ruminants (cattle and sheep) are considerably less favourable. **Pig breeding** is an industrial sector of livestock breeding which, due to the lack of production of concentrated foodstuff, is not as significant as the cattle and sheep breeding and, more recently, the poultry breeding. **Poultry breeding** has seen positive changes such as opening of new farms for egg production, expansion of broiler production, opening of slaughterhouses and processing capacities which have not yet been properly registered in official statistics. In

recent years, progress has been recorded in egg production as well.

The milk and dairy sector and the meat and meat products sector are directly linked to the livestock breeding. **Dairy sector**, despite having individually the largest share in value, is not properly developed since only 15% of primary production of milk is processed in dairy facilities. Development of Montenegro's meat industry has been dynamic over the past ten years, with considerable investments made in construction of modern facilities and modernisation of equipment for slaughtering and meat processing. Production of traditional dried ham (*prosciutto*), made from imported pig meat which is smoked and dried in the air, is extremely important part of Montenegro's meat processing sector. *Prosciutto* of Njeguši is produced in the area of Njeguši, which comprises a surface of around 8 km² in Cetinje municipality, located between the towns of Cetinje and Kotor.

Beekeeping has a long and rich tradition in Montenegro. Presence of several climate zones, extensive areas covered by natural meadows and pastures and spacious karst area with abundant floristic composition and many honey-bearing plants created very favourable natural conditions for the development of this economic activity.

4.3 Concluding Remarks

One of the structural characteristics of food production is that share of primary agriculture in GDP is higher than that of the food processing sector. The major share of agricultural products, particularly when it comes to plant production, is sold on green markets or offered for organised buying up of surpluses, while the share of pre-agreed production for a known buyer is relatively small. Unfavourable structure, small number of enterprises and insufficient technological equipment all have negative

impact on competitiveness of the food processing industry and achievement of the international sanitary-hygienic norms and standards. In addition to the shortcomings identified at the level of enterprises, shortcomings have also been identified at the institutional level in terms of implementation of the food control system. To boost competitiveness of this sector, it is necessary to engage in technological upgrade which would result in greater economic efficiency and higher quality products. In addition, there are evident shortcomings when it comes to development of new products, promotion and marketing.

Socio-economic Significance of Agricultural Sector

Agriculture is the second most important development and economic priority for Montenegro, after tourism. High share of agriculture (together with hunting, forestry and fisheries) in total GDP – as much as 7.9% in 2011 – testifies of the sector's high importance for the national economy. According to the 2011 MONSTAT data, the contribution of hunting and forestry to the GDP does not exceed 1%, which means that the share of agriculture, excluding hunting and forestry subsectors, exceeds 7%. This is quite high especially if compared to the EU average which is less than 2%. In the period 2001-2011, the sector recorded steady growth as a result of which gross added value during the period in question grew by 83%.

Increase of population (1.9%) was recorded in the coastal region in the period between two censuses (2003 and 2011). Analysis of population distribution by the type of settlements shows that the majority of inhabitants in Montenegro are concentrated in the urban centres and surrounding settlements (63.23%). In the coastal region, it is only the municipality of Bar that has more inhabitants living in rural (58.03%) than in urban areas. Out of the total number of agricultural population in the country, 7,931 persons or 8.1% lives in the coastal region. As for the age structure on agricultural holdings, it is characterised by a high share of older persons working on the holdings. According to the data of the 2011 agricultural census, out of the total number of persons working on agricultural holdings in the coastal region the majority are those with secondary school degree. The number of those with college or university degrees working in agriculture amounts to just 1.3%. It is interesting to point out that according to the data of the 2010

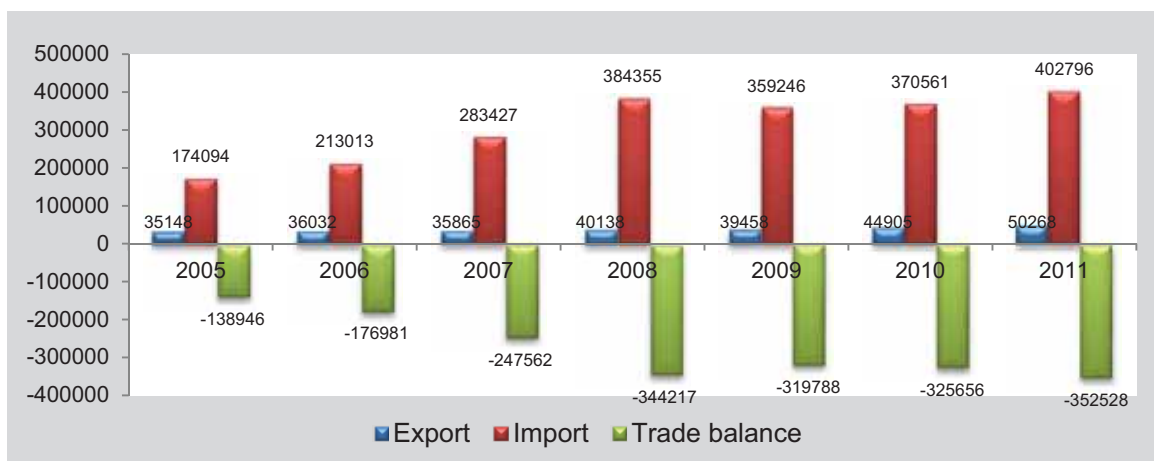
agricultural census, not a single person with master's or doctoral degrees in agriculture or other sciences was registered as a member of any household working on a family agricultural holding. The problems mentioned above are linked to migration of rural population to urban areas, unfavourable age structure, unfavourable educational structure and insufficient investments in development of rural areas and their living conditions.

5.1 Foreign Trade in Agricultural Products

According to the MONSTAT data, the largest Montenegrin exports of agricultural products are wine and other alcoholic beverages (around EUR 22 million in 2011). Annual value of wine export exceeds EUR 18 million. This is followed by export of fruits and vegetables (around EUR 10 million in 2011), while in the recent years a positive trend has been recorded in exporting meat and meat products (around EUR 5 million in 2011). Nevertheless, Montenegro is net importer of food and beverages, while export accounts for merely 12% of total import (in million EUR). The chart below shows negative trade balance³ based on the MONSTAT data for the period 2005-2011:

³ Balance of trade referring to beverages, food and live animals.

Chart 2: Trade in agricultural food products (in thousands EUR) 2005-2011



Production of olive oil is far from meeting domestic needs and there is demand and market for olive products. In 2011, import of olive oil was 148 times higher than its export, while the revenue generated from exports accounted for one tenth of the value of imports. In terms of quantities, export of citrus fruits covered only one-twelfth of import of these products, while the cost of import of oranges and tangerines was 9.3 times higher than the value of their export. Unlike olive and citrus growing sectors, the vineyard sector is characterised by the surplus in trade. Montenegro's export of wine is 2.8 times higher than its import, i.e. revenue of EUR 18 million is generated which is five times higher than the amount spent on imports of these products.

Insufficient quality, uncompetitive prices, lack of quality standards, poor marketing, inadequate conditions for buying up surpluses, storage and processing etc. are the most important reasons for Montenegro not having a significant group of competitive products at the moment. In addition to identification of products that have relative competitive advantages over neighbouring countries, it is important to provide sectoral analysis of the possibilities for selling products to the countries in the region through professional market analysis which should enable further selection between competitive products.

5.2 Institutional Support to Agricultural Development

The Ministry of Agriculture and Rural Development is responsible for implementation of the current and development agricultural policies of the Government of Montenegro, as well as for policies on sustainable use of forests and water resources. The most important institution for education in the field of agriculture is Biotechnical Faculty with its ten scientific-research centres, including the Centre for Subtropical Cultures in Bar. In the framework of technical-advisory segment, there are Service for Livestock Selection and Advisory Service for Plant Production which enable implementation of agricultural incentive measures funded through the agriculture budget. Moreover, there are five technical schools in the territory of Montenegro. Except for secondary agricultural school in Bar, which is the only one specialised in this field, the other schools are of mixed nature.

5.3 Incentives and Agricultural Policy

Along the lines of Common Agricultural Policy (CAP) of the European Union, which Montenegro is harmonising its agricultural policy with,

incentives to support agriculture and rural areas are classified in three basic groups or pillars⁴:

- the first pillar includes support to producers and interventions in the market of agricultural food products;
- the second pillar comprises rural development measures which are further classified under different so called axes (the first one is related to the competitiveness of agricultural and processing industry, the second to sustainable use of resources in agriculture and forestry and the third one to diversification of economic activities and creating better living conditions in the countryside);
- the third pillar is related to general services and services in agriculture.

Montenegro has harmonised the basic concept of its agricultural policy with the CAP, but a lot of work remains to be done in terms of establishing a functional system for implementation of all the measures. The most important type of state support for development of agriculture is provided through the implementation of agricultural budget measures including a set of incentive measures in the form of grants awarded for agricultural development. In the framework of the first pillar of agricultural policy, direct payments to producers are the most important ones: subsidies per hectare of land used for growing crops and support given per animal (cattle, sheep and goats) kept for breeding. Measures for stabilisation of the agricultural products market (buying up of seasonal surpluses to intervene on the market and risk management in agriculture) also belong here.

The scope of these measures will expand depending on the extent to which national

⁴ In terms of the funding sources, the measures from the first pillar are nowadays entirely funded from the EU budget, whereas for rural development measures co-financing from national budgets is allowed in the amount of ¼ of public funds. General services are not funded from the EU but from national budgets in the form of state aid for which consent is given by the European Commission.

agricultural policy will be harmonised with the EU Common Agricultural Policy (CAP). It is expected that the amounts per hectare of the land or per animal will rise in the process. From 2002 onwards, the amount and structure of agriculture budget has changed as a result of harmonisation with requirements of the EU Common Agricultural Policy, while more funds have been allocated. The EU has continuously provided support to the development of Montenegro's agriculture and rural areas since 1999. From that time until 2010, the EU provided support to Montenegro's agriculture which totalled EUR 20.6 million.

The rural development policy (second pillar) focuses on financing activities that lead towards improvement of living and working conditions in the countryside in order to reduce migration of rural population to urban areas, as well as to address unfavourable age and educational structures and quality of life in the countryside in general.

The third component or pillar of agricultural policy is related to the financial support to general services in agriculture such as educational, research and development programmes, extension services and programmes for the quality control of products.

Besides the programmes mentioned above, Montenegro also implements what is known as the fourth pillar of agricultural policy that encompasses certain social policy aspects for rural society. Social transfers to rural population in the form of pensions aim at ensuring proper standard of living in rural areas and account for significant share of agriculture budget (15.6% in 2010).

Support to agriculture was also provided by incentivising agricultural production through lower tax rate which amounts to 7% for basic agricultural products and equipment for performing agricultural activities. Such measures demonstrate commitment to also contribute to agricultural development through the taxation system.

6.1

Methods of Work

In preparing the model of attractiveness and suitability of the coastal zone for the development of selected agricultural sectors, spatial analysis was carried out comprising attractiveness assessment, vulnerability assessment and assessment of the suitability of space. Graphical overview of individual phases of the analysis is presented in the Figure 3.

The purpose of the spatial assessment of attractiveness for agricultural development is to determine those parts of space in which it would be justified to preserve the existing agricultural areas in the long run and to establish, in the most efficient manner, new areas with the most important crops for the coastal zone. To this end, it is necessary to carry out valuation of space against environment protection goals set in the vulnerability assessment in the planning process. Protection and development goals are compared and harmonised in the assessment of suitability of space for agricultural development by seeking more attractive and less vulnerable areas of the space and by using results of the general vulnerability assessment. Spatial coverage is the area of 6 coastal municipalities: Herceg Novi, Kotor, Tivat, Budva, Bar and Ulcinj.

Two tasks are important in spatial modelling: a) division of the space into homogenous spatial units; and b) assigning values to these units. The assessment of attractiveness and suitability of the coastal zone of Montenegro for the development of selected agricultural sectors uses raster based method which is why the unit of division is represented by a raster cell, while the assigned values are information (data

categories) in the cell. Dimensions of raster cells are 25 x 25 m. The modelling was prepared by using ProVal2000 application.

Agricultural sectors addressed in this analysis were selected on the basis of analysis of the current condition and development potential of the coastal zone. These are olive, citrus and grape wine growing, livestock (small ruminants) breeding and beekeeping.

For the assessment of attractiveness of the above-mentioned agricultural sectors attractiveness matrices were prepared in which soil attractiveness was evaluated by assigning scores from 1 (unattractive) to 5 (very attractive) according to the following parameters / criteria and their sub-criteria: slope of terrain, altitude, sun exposure / exposition of terrain, soil quality, supply of irrigation water, and basic infrastructure. Since not all the parameters are equally important, in combining / joining them in the overall attractiveness model, each parameter and their sub-criteria were attributed a score of relevance based on expert judgement. Data (both, graphical and analytical) available through the sources of official institutions were used for the selected criteria (for example: pedological map 1:50000, source: University of Montenegro – Biotechnical Institute; atlas of pedological maps 1:50000 (2000 Podgorica), source: database of the Montenegrin Institute for Hydro-meteorology and Seismology, etc.). Each individual score is accompanied by a qualitative expert assessment.

Graphical presentations/overviews of spatial modelling for each of the analysed parameters were prepared based on performed attractiveness assessment of space by using

ProVal2000 application. By overlapping maps drawn for different parameters, graphical overviews of joined attractiveness models for individual agricultural sectors were obtained with differentiation between less and more attractive zones for growing the crop in question, i.e. for performing respective agricultural activities (accompanied with statistically substantiated overviews of surfaces in each of the five categories ranging from unattractive to highly attractive agricultural land). In the next phase, and in the context of development of the suitability model, vulnerable environmental segments were identified in relation to agricultural development (overview of environmental segments was taken from the study General Vulnerability Assessment prepared in the framework of CAMP Montenegro). Related to this part of work, it was concluded that current agricultural activity does not have significant negative impacts on environmental segments. Therefore, having in mind significant negative impacts of other activities on agriculture and constant reduction of the size of agricultural land, **assessment of suitability for agriculture was by its concept defined as a developmental one**. This means that in comparing and harmonising protection and development goals in the suitability model, priority was given to the development goals of agriculture, i.e. to the areas that are more attractive for agricultural development. In this way, **larger scope of areas that are considered highly attractive for agriculture are at the same time considered as highly suitable for development of agriculture.**

The assessment of suitability for growing olives, citrus and grape vine was prepared by combining attractiveness model with the model of vulnerability of ground water (zones of sanitary protection and springs), i.e. with the model setting out the possibilities for irrigation. Vulnerability assessments and attractiveness assessments are combined in suitability

assessment by following the principle demonstrated in the Table 1.

The suitability assessment for olives, citrus and grape vine showed there were several areas suitable for two or for all the analysed crops at the same time. That is why **overlapping of suitability for several crops was carried out. The results indicated possible flexibility of agriculture (conditions to shift from one variety to another) in certain areas and therefore their high significance, which makes strategic preservation of agricultural land within these areas justifiable**. To that end, **prioritisation** (priority setting) was carried out in the areas in which there is overlapping of suitability for two or more crops. The purpose of this analysis was to identify priority areas for certain crops.

On the basis of the results obtained through attractiveness and suitability assessment, the guidelines and recommendations relevant for preparation of the SPSPCZ MNE and National Strategy for Integrated Coastal Zone Management (NS ICZM) were developed. At the same time, these are relevant for preparation of the documents in the fields of agriculture and economy.

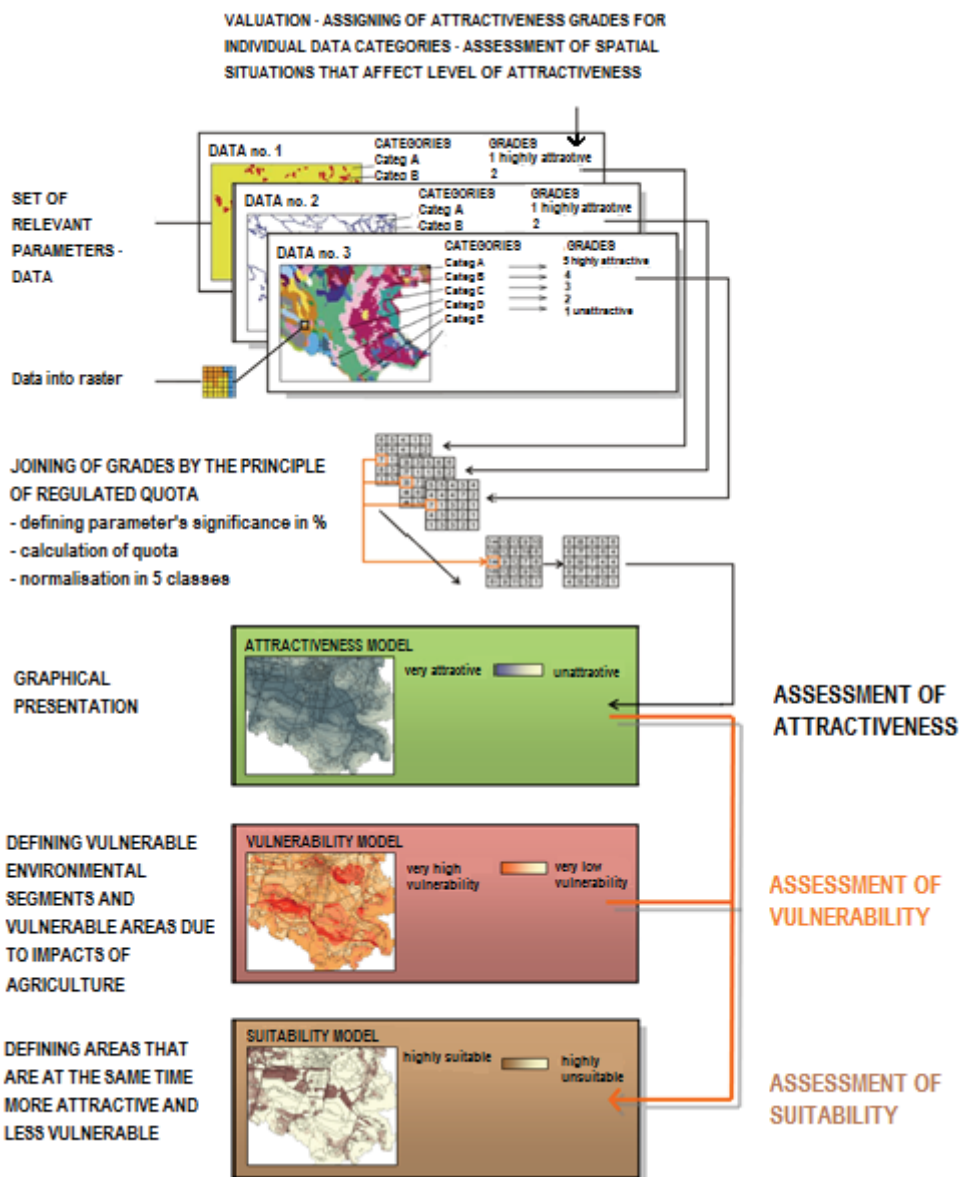


Figure 3: Steps in development of the model of attractiveness and suitability of the space for agriculture

Table 1: Principle for assigning suitability scores

Suitability score		Attractiveness Assessment				
		Unattractive (1)	(2)	(3)	(4)	Very attractive (5)
Vulnerability assessment	Very low vulnerability (1)	1	2	3	4	5
	Low vulnerability (2)	1	2	3	4	5
	Moderate vulnerability (3)	1	2	3	3	4
	High vulnerability (4)	1	2	2	2	3
	Very high vulnerability (5)	1	1	1	1	1

6.2 Olive Growing

Production of olives and olive oil is very important agricultural sector on the Montenegrin coast. Olive yards cover around 3,000 ha and have 88% of the total number of olive trees (495,920) in the territory of Montenegro (MONSTAT, Statistical Yearbook 2012). Olives are the most widespread variety in the municipalities of Bar and Ulcinj, while olive yards are mainly located on the sloped terrain at the foot of the mountains, i.e. in the areas which could not be used for intensive cultivation of other agricultural crops. Older plantations prevail at the moment, of which more than 30% are threatened by expansion of forests, while the younger ones account for only 10%. Autochthonous species (variety *žutica* and others) prevail and account for around 90% of all the trees. They are used for production of oil and of a very small quantity of conserved olives. Even though there is a large potential for production of a high quality olive oil, some 50% of the country's capacities are currently used.

6.2.1 Assessment of Attractiveness and Suitability of the Coastal Zone for Olive Growing Sector

Attractiveness of the coastal zone for olive growing was analysed primarily from the perspective of criteria significant for availability of natural resources (soil quality, slope of terrain, sun exposure - exposition and altitude) after which the supply of irrigation water and condition of basic infrastructure were taken into consideration. Valuation of attractiveness of the space for olive growing, having in mind natural and infrastructural preconditions/ prerequisites for its development, was carried out on the basis of the following matrix. In doing so, attractiveness in terms of the market for olive growing products was not considered. In making decision on establishment of new olive yards the

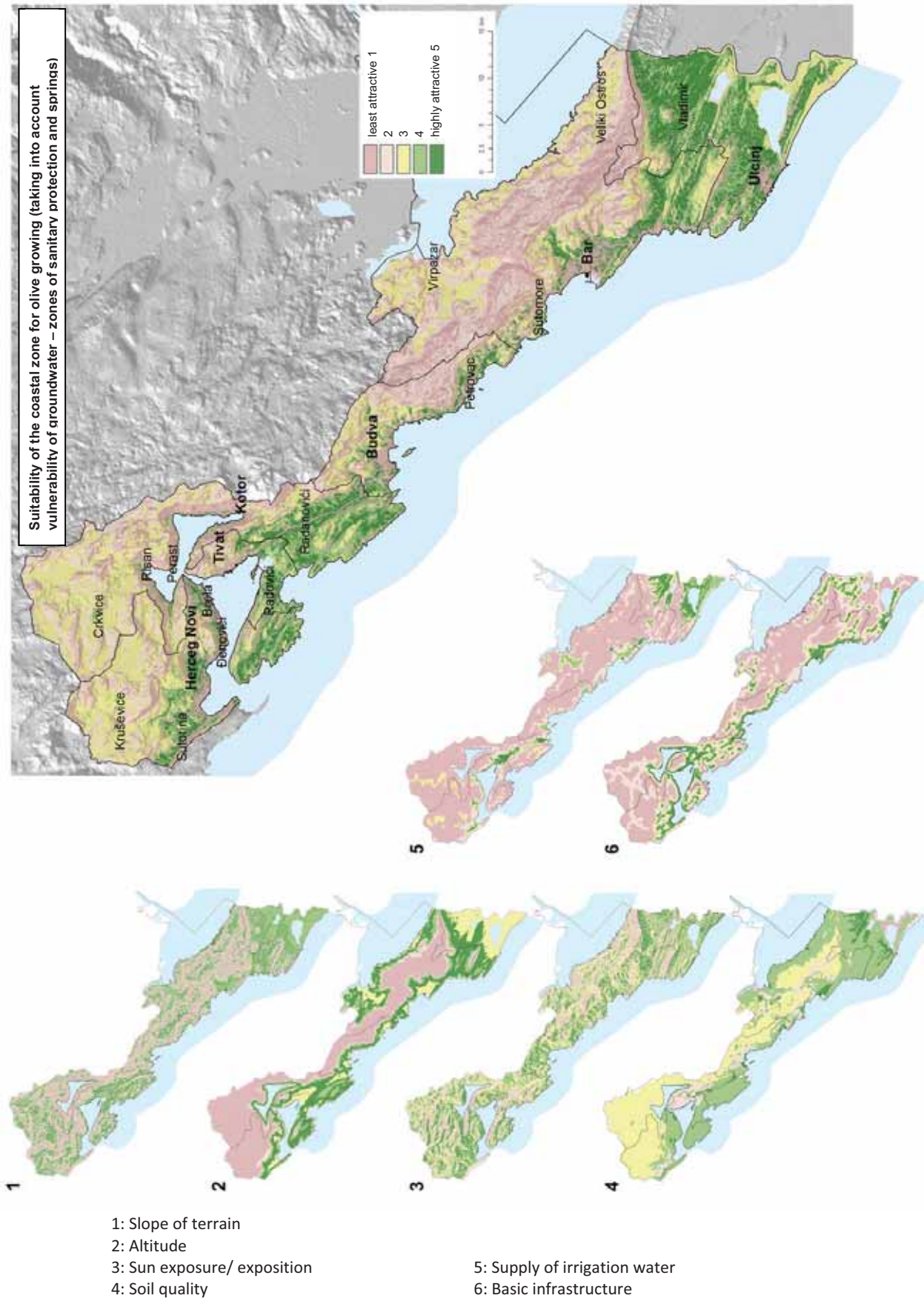
market aspect would certainly have to be one of the crucial factors in total assessment.

The spatial presentation of the assessment of coastal zone's attractiveness for individual parameters as well as of its suitability for olives growing is provided in the map 3 below.

Remark: *Since natural habitat of olive is the Montenegrin coast and since olive growing in Crmnica area in the municipality of Bar is limited due to low temperatures, the model only considered the area extending from the mountain range towards the sea which means that the area located east of the mountain range, in the direction towards Lake Skadar, was excluded.*

Table 2: Assessment of attractiveness of the space for olive growing by parameters/criteria and sub-criteria/categories

Parameter/criterion	Sub-criterion/Category	Attractiveness Assessment
Slope of terrain	0 – 6%, flat to slightly undulated terrain	4
	6 – 12%, slightly sloping plateaus and gentle slopes	5
	12 – 25%, moderately steep slopes and slightly broken terrain	3
	25 – 45%, steep slopes and/ or broken terrain	2
	> 45%, extremely steep slopes and extremely uneven/ broken terrain	1
Altitude	0 – 50 meters ASL	3
	50 – 250 meters ASL	5
	250 – 400	4
	400 – 500	2
	500 and more meters ASL	1
Sun exposure – exposition	N	1
	NE	2
	NW	2
	S	5
	SE	4
	SW	4
	E	3
	W	3
Soil quality	Karst–dolomite black soil	3
	Brown eutric soil	4
	Brown acid soil	2
	Red soil	4
	Alluvial–delluvial	5
	Marshy and salinised soil	1
Supply of irrigation water	The most favourable irrigation conditions	5
	Favourable irrigation conditions	4
	Limited access to irrigation	3
	Insufficient access to irrigation	2
	No access to irrigation	1
Basic infrastructure	Complete infrastructure and proximity to urban centres (asphalt road, stable electric grid, water supply system, postal and telecommunication services, internet, facilities for general use etc.)	5
	Somewhat more remote areas, with asphalt roads, stable electric grid, water supply system, postal and telecommunication services, no other facilities	4
	Somewhat more remote areas, with road surface, stable electric grid, water supply system, postal and telecommunication services	3
	Remote areas, with lower quality asphalt roads, electric grid with unstable supply	2
	Remote areas with difficult access, without asphalt roads and other basic infrastructure	1



Map 3: Assessment of attractiveness and suitability of the coastal zone for olive growing

On the basis of the coastal zone attractiveness matrix shown above and spatial presentations of attractiveness and suitability for olive growing sector, it can be concluded that the following areas are **attractive, i.e. suitable**:

- Localities Ulcinj-Valdanos and Ulcinjsko field in Ulcinj area;
- The area of Bar: Dobra voda, Zaljevo-Stari Bar-Sustaši, Tuđemili-Zubci, Šušanj and Sutomore;
- The area of Grbalj in which there are also conditions for irrigation (construction of reservoirs) and the cove Bigovo-Trsteno;
- The area of Herceg-Novi: Sutorina, Luštica and hinterland of Herceg Novi;
- Paštrovići.

Less attractive, i.e. suitable are locations of larger flat fields and coves' edges where there is possibility of rising groundwater levels, slower drainage of atmospheric precipitation and potentially lower level of air circulation (draught).

The listed areas which are attractive for olive yards should be preserved and protected against land-use change. Improvement of olive growing by cultivating new plantations, including revitalisation and reconstruction of old olive trees as well as planting of new ones, is necessary across the entire coastal zone.

Despite the potential for larger-scale production of olives and olive oil, the potential is not adequately used due to the facts that local producers are not organised and that there is an increasing competition from foreign markets (Italy, Spain, Greece, etc.). By creating market preconditions for full utilisation of this production, improvement of marketing and introduction of standards into production, the total production might increase by more than 11 times⁵. To increase production, it is necessary to establish connection between the holdings

engaged in olive growing primarily by development of clusters.

At the moment, import of olive oil exceeds its export which means that the market for this product exists. Increase in export would boost competitiveness, thus leading to improvement of the standard of living of the population over a long period of time. Boosting competitiveness of olive growing sector and sale in international markets will lead to investments being made in equipment and new technologies, as well as in the know-how. Producers must acquire knowledge about market rules and market operations, improve their knowledge and access to information, adjust investments to the needs and improve cooperation with processors and other producers.

⁵ Montenegrin Investment Promotion Agency (2012): *Invest in Montenegro – Analysis of Agricultural Sector*, MIPA, Podgorica

6.3 Growing of Citrus Fruits

Out of the total 440,000 productive trees of citrus fruits in Montenegro, 99.7% are located in the coastal region (2012 Statistical Yearbook). As with olive growing, in this region there is also no single registered business entity growing citrus fruits on large plantations. Among various citrus fruits, tangerine has dominant position as its varieties are adapted to the agro-environmental conditions and they have good yields of excellent quality. Still, production cannot meet own needs, particularly for oranges, which is why they are imported. The quality of citrus fruits is uneven, while products in the market are not sorted by their shape and size, nor are they properly packaged. The major share of produced citrus fruits is sold on green markets or is subject to buying up of surpluses. Prices of citrus fruits are freely established on the market as a result of agreement between purchasers and producers. Due to high impact of climate factors on agricultural production, the yield of citrus fruit may vary considerably from one year to another which directly influences determination of the purchase price. Lack of storage and processing capacities also has direct impact on the prices of citrus fruits.

6.3.1 Assessment of Attractiveness and Suitability of the Coastal Zone for Citrus Fruits Sector

Attractiveness of the coastal zone for citrus fruits growing was analysed primarily from the perspective of criteria significant for availability of natural resources (soil quality, slope of terrain, sun exposure - exposition and altitude) after which the supply of irrigation water and condition of basic infrastructure were taken into consideration. Valuation of natural and infrastructural preconditions for development of citrus fruits sector was carried out on the basis of the following matrix. In doing so,

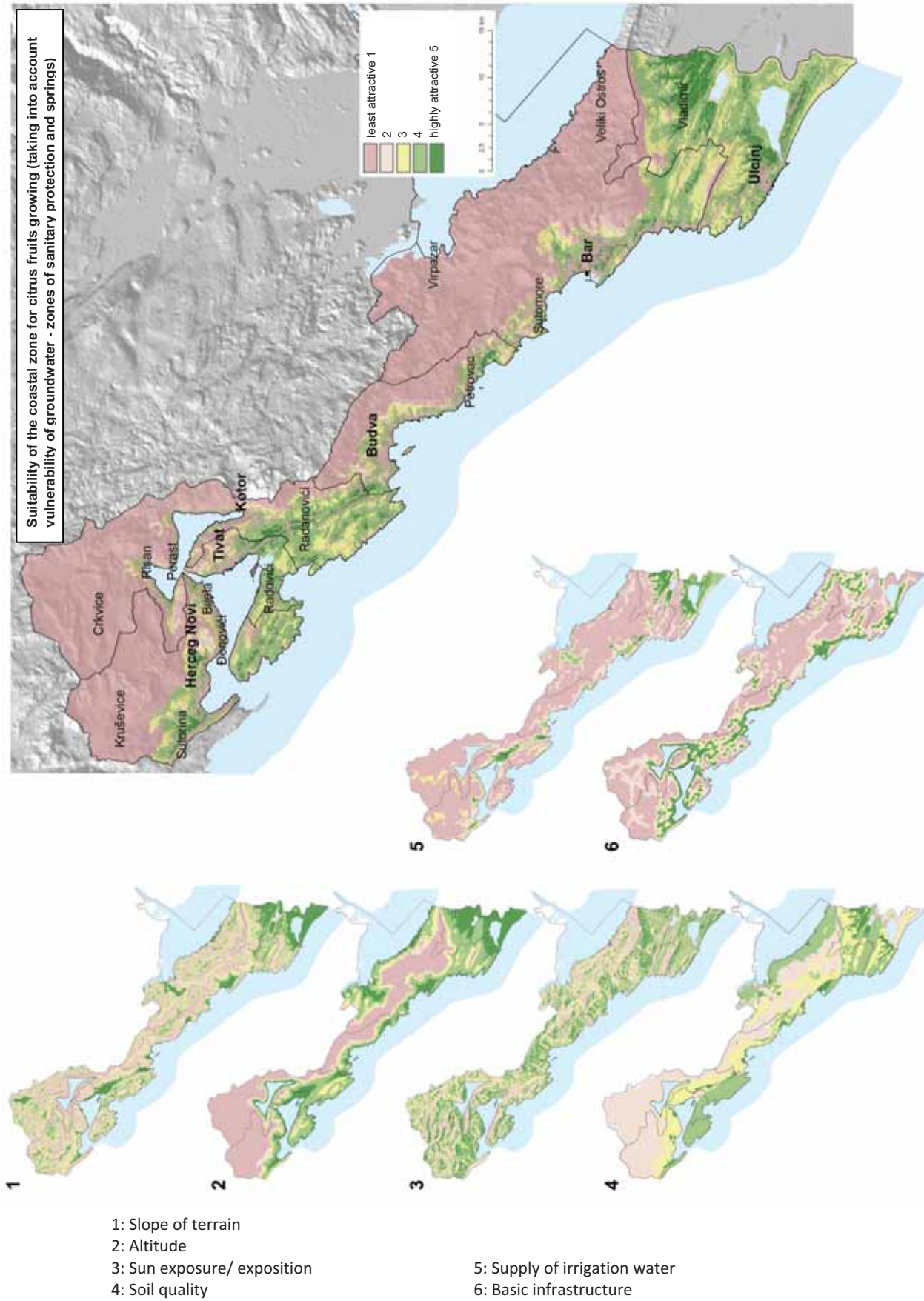
attractiveness in terms of the market for citrus was not considered.

The spatial presentation of the assessment of coastal zone's attractiveness for individual parameters as well as of its suitability for citrus fruits growing is provided in the Map 4 below.

Remark: *Since conditions for citrus fruit growing in Crmnica area in the municipality of Bar are limited due to low temperatures, the model only considered the area from the sea to the mountain range which means that the area located east of the mountain range, towards Lake Skadar, was excluded.*

Table 3: Assessment of attractiveness of the space for citrus fruits sector by parameters/criteria and sub-criteria/categories

Parameter / Criterion	Sub-criterion / Category	Attractiveness Assessment
Slope of terrain	0 – 6%, flat to slightly undulated terrain	5
	6 – 12%, slightly sloping plateaus and gentle slopes	4
	12 – 25%, moderately steep slopes and slightly broken terrain	3
	25 – 45%, steep slopes and/ or broken terrain	2
	> 45%, extremely steep slopes and extremely uneven/ broken terrain	1
Altitude	0 – 50 meters ASL	5
	50 – 250 meters ASL	4
	250 – 400	3
	400 – 500	2
	500 and more meters ASL	1
Sun exposure – exposition	N	1
	NE	2
	NW	2
	S	5
	SE	4
	SW	4
	E	3
	W	3
Soil quality	Karst–dolomite black soil	2
	Brown eutric soil	2-3
	Brown acid soil	3
	Red soil	4
	Alluvial–delluvial	5
	Marshy and salinised soil	0-1
Supply of irrigation water	The most favourable irrigation conditions	5
	Favourable irrigation conditions	4
	Limited access to irrigation	3
	Insufficient access to irrigation	1-2
	No access to irrigation	0-1
Basic infrastructure	Complete infrastructure and proximity to urban centres (asphalt road, stable electric grid, water supply system, postal and telecommunication services, internet, facilities for general use etc.)	5
	Somewhat more remote areas, with asphalt roads, stable electric grid, water supply system, postal and telecommunication services, no other facilities	4
	Somewhat more remote areas, with road surface, stable electric grid, water supply system, postal and telecommunication services	3
	Remote areas, with lower quality asphalt roads, electric grid with unstable supply	2
	Remote areas with difficult access, without asphalt roads and other basic infrastructure	1



Map 4: Assessment of attractiveness and suitability of the coastal zone for citrus fruits growing

On the basis of the above presented matrix of attractiveness of the coastal zone for citrus fruits growing and spatial presentations of attractiveness and suitability, it may be concluded that numerous sites along the coast are **attractive and suitable**. **Less attractive, i.e. suitable** are locations where fragmented plots are found on terraces and in family gardens of the majority of coastal households that grow citrus fruits, regardless of their prime occupation.

6.3.2 Guidelines

Plantations with citrus fruits as well as attractive sites mentioned above should be protected against conversion into construction areas for development of apartments, tourism and other infrastructural facilities. Zones in which larger plantations may be grown with larger-scale production for market will present an opportunity for achieving higher level of employment and good income of employees and local community in the long run.

Resolution of problems such as inadequate packaging and lack of technological or storage capacities will increase the production itself and decrease needs for import, while certain quantity may be exported as well. This may be achieved by cultivating new citrus fruits plantations, increasing production of citrus fruits for the market, establishing clusters of citrus fruits growers, buying up of market surpluses, improvement of marketing, encouraging organic farming, sale of domestic products through tourism and ensuring higher level of processing of primary products.

As a result of the increased need for fresh fruits, which is particularly pronounced during tourist season, investments should be made in agricultural development in order to meet the needs of the domestic market. Increased competitiveness in citrus fruits growing may be achieved by modernisation of agricultural

holdings, better use of resources and labour force, introduction of new technologies and innovation, while strong focus should be placed on market-oriented producers. This requires modern orchards to be established by using seedlings of the controlled quality.

6.4 Viticulture

Viticulture has a long tradition in the coastal region, whereas according to the MONSTAT data a significant growth tendency was recorded in the areas covered by vineyards over the course of recent years. According to the 2012 Statistical Yearbook, out of the total number of vine plants (17,014,027) in the country, 1,800,959 or 10.6% are located in the coastal region.

Viticulture is the most widespread in the municipality of Bar (959,500 vine plants), i.e. in Crmnica area, followed by the municipality of Herceg-Novi with 322,734 vine plants and Kotor with 261,000 vine plants. Despite its small size, the municipality of Tivat has 124,500 vine plants and is slightly ahead of the municipality of Ulcinj (119,000 vine plants), while in the area of the municipality of Budva there are just 14,225 vine plants.

Autochthonous species *vranac* and *kratošija* that are used for the production of wine and brandy are predominant. Table varieties and to a smaller extent vine varieties are grown in family gardens on overhead constructions. Grape yields are stable and of standard quality.

6.4.1 Assessment of Attractiveness and Suitability of the Coastal Zone for Viticulture

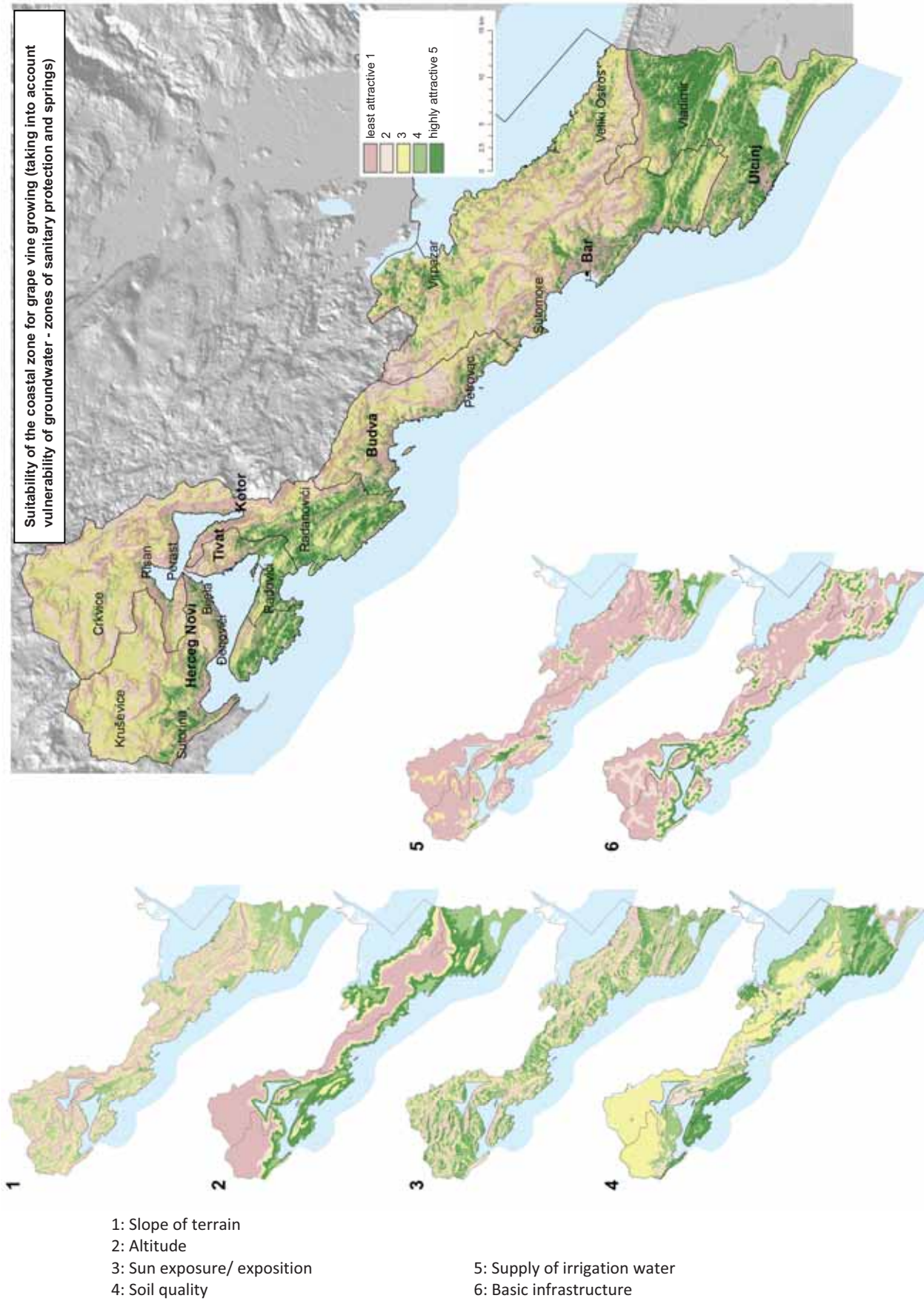
It should be pointed out that in the matrix of coastal zone's attractiveness for viticulture attractiveness of the space with regards to table grapes and wine market has not been assessed. Taking into account grape vine growing in Montenegro, as well as the fact that wine is the main export product of the entire agricultural production, the market aspect should be assessed before making a decision on vineyards cultivation.

The spatial presentation of the assessment of coastal zone's attractiveness for individual parameters as well as of its suitability for grape vine growing is presented in the Map 5 below.

Remark: *Unlike the approach applied for olives and citrus fruit, the whole coastal region was taken into account in the analysis for grape wine, including also areas to the east from the mountain range towards Lake Skadar.*

Table 4: Assessment of attractiveness of the space for viticulture by parameters / criteria and sub-criteria / categories

Parameter / Criterion	Sub-criterion / Category	Attractiveness Assessment
Slope of terrain	0 – 6%, flat to slightly undulated terrain	5
	6 – 12%, slightly sloping plateaus and gentle slopes	4
	12 – 25%, moderately steep slopes and slightly broken terrain	3
	25 – 45%, steep slopes and/ or broken terrain	2
	> 45%, extremely steep slopes and extremely uneven/ broken terrain	1
Altitude	0 – 50 meters ASL	4
	50 – 250 meters ASL	5
	250 – 400	3
	400 – 500	2
	500 and more meters ASL	1
Sun exposure – exposition	N	1
	NE	2
	NW	2
	S	5
	SE	4
	SW	4
	E	3
	W	3
Soil quality	Karst–dolomite black soil	3
	Brown eutric soil	4
	Brown acid soil	2
	Red soil	5
	Alluvial–delluvial	2-3
	Marshy and salinised soil	0-1
Supply of irrigation water	The most favourable irrigation conditions	5
	Favourable irrigation conditions	4
	Limited access to irrigation	3
	Insufficient access to irrigation	1-2
	No access to irrigation	0-1
Basic infrastructure	Complete infrastructure and proximity to urban centres (asphalt road, stable electric grid, water supply system, postal and telecommunication services, internet, facilities for general use etc.)	5
	Somewhat more remote areas, with asphalt roads, stable electric grid, water supply system, postal and telecommunication services, no other facilities	4
	Somewhat more remote areas, with road surface, stable electric grid, water supply system, postal and telecommunication services	3
	Remote areas, with lower quality asphalt roads, electric grid with unstable supply	2
	Remote areas with difficult access, without asphalt roads and other basic infrastructure	1



On the basis of the above presented matrix of attractiveness of the coastal area for viticulture and spatial presentations of attractiveness and suitability, it can be concluded that a large part of the municipality of Bar, and Crmnica area in particular, is **attractive, i.e. suitable** for grape vine growing, also from the aspect of cultivating vineyards on larger surfaces. Moreover, all the areas in the coastal zone that are exposed to sun and located on gentle slopes are attractive for viticulture, and these include Ulcinjsko field, Zoganjsko field, Zelenika and Sutjel, Mrčevo and Tivatsko field and Sutorina. **Less attractive, i.e. suitable** areas are those from terraced terrains with fragmented plots, as well as the family gardens and yards in which grapevine is grown mainly on overhead constructions.

adopting the principles of integrated management, wine production technology and marketing (branding, sale and promotion).

6.4.2 Guidelines

Areas attractive for growing grape vine should be protected against conversion into construction land. Since small vineyards prevail in the coastal region, it would be desirable to join producers into a cluster. This would lead to the increased production and cost cutting, as well as to improvement of the level of specialisation and attainment of a higher quality of products, greater yields and larger number of employees.

Focusing production on specific and traditional products of high quality would make considerable contribution to the development of horizontal integration between wine and tourism subsectors and would also make tourism offer more attractive. In addition, it is necessary to intensively cultivate vineyards with adequate varieties, create satisfactory domestic bases of the raw material for production of high quality wine and make efforts to increase the number of wines with geographic origin. In addition to recommendations applicable for olives and citrus growing, in viticulture and wine production support should be also directed towards increasing the size of vineyards,

6.5 Beekeeping

Even though beekeeping is often a side activity, it has a long tradition in all the regions of Montenegro, including the coastal zone. Almost the entire coast is suitable for beekeeping since it has floristic composition abundant with the Mediterranean and mountain herbs. In addition to climate and other natural conditions for nectar producing, honey yield per beehive also depends on the form of beekeeping (whether it is stationary or mobile). Total annual production of honey ranges between 400 and 700 tons⁶. According to the estimates of the Association of Beekeeping Organisations of Montenegro, only a small share of this production is marketed in retail (5%), while the major share is sold in green markets or through what is known as a doorstep sale.

6.5.1 Suitability of the Coastal Zone for Beekeeping

Unlike olive, citrus fruit and grape growing sectors which are closely linked to and conditioned by the soil quality in the broadest sense, slope of terrain, exposition and altitude, these factors have considerably lower impact on beekeeping due to, amongst other things, the fact that bees fly even for a few kilometres away from the beehive (up to 8 km) to collect nectar. Therefore, the attractiveness matrix is not applicable to beekeeping. The text below gives a brief overview of some of the analysed factors that affect attractiveness for beekeeping.

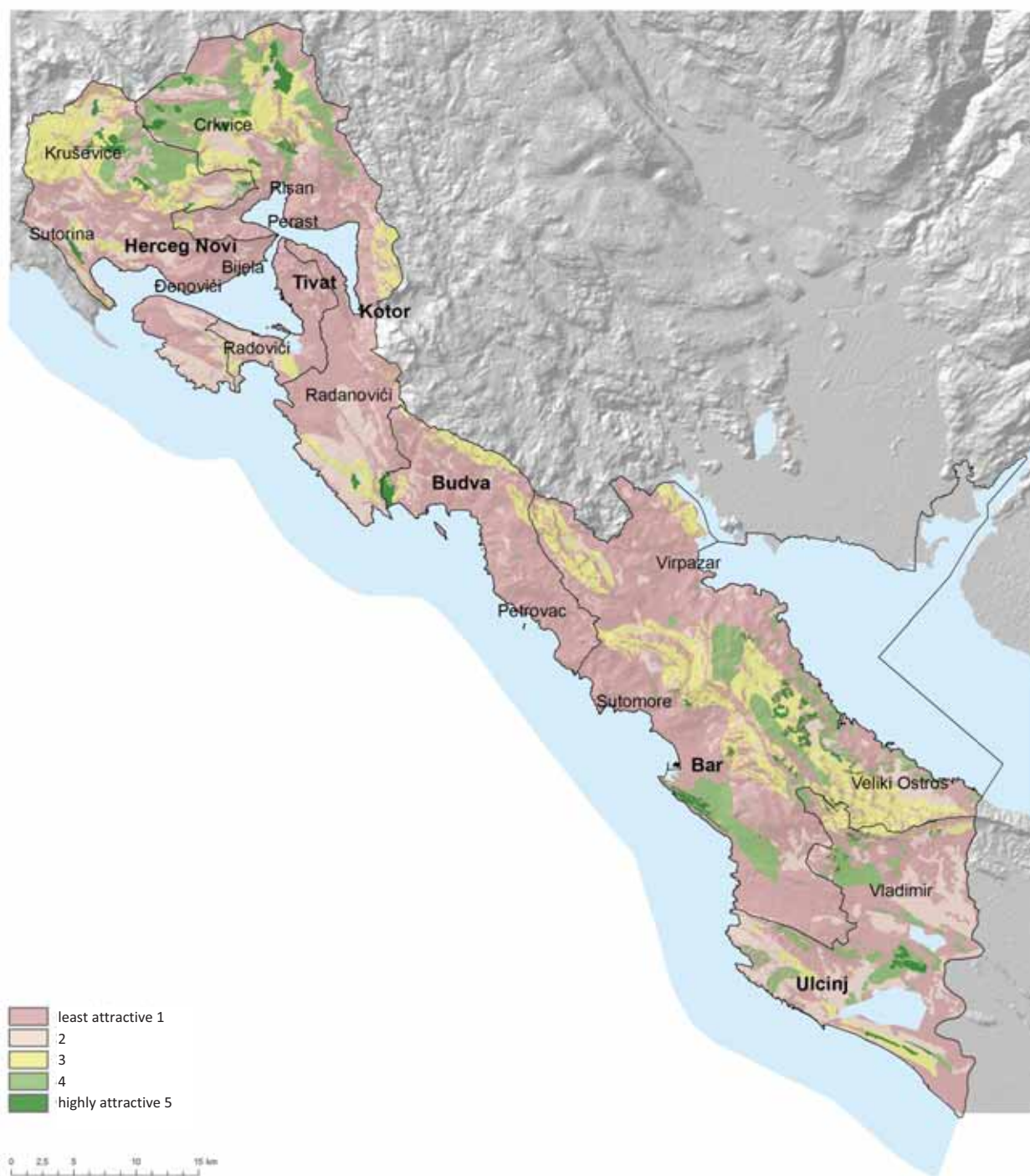
In terms of the **slope of terrain**, gentle slopes of 0-6% and slopes of 6-12% are suitable for both types of beekeeping, i.e. stationary and mobile. On somewhat steeper slopes, from 12 to 25%, it is still possible to organise honey production provided that basic infrastructure is in place. On

even steeper slopes, i.e. those exceeding 25%, basic infrastructure is in principle insufficient which makes beekeeping more difficult and almost impossible in some cases. **Altitude and sun exposure of terrain** are not directly important for beekeeping. However, sun exposure is very important for the growth of honey-bearing plants since terrains with higher sun exposure have more abundant honey-bearing flora, which determines honey production. Availability of **basic infrastructure** is very important for beekeeping. Complete infrastructure provides producer with an urban way of life and enables access to information as well as communication with advisory and other technical services concerning measures to be taken with the beehives, etc.

More attractive areas may be singled out if the intent is to produce certain types of honey, for instance wormwood honey may be produced by moving bees to the area in which there is wormwood, acacia honey by moving bees to the areas where there are acacia, meadow honey by moving them to where there are meadows etc. Statistical data lead towards conclusion that the most attractive areas for beekeeping are Bar and Herceg-Novi, followed by Ulcinj and Kotor.

Honey-bearing plants were analysed and areas were assigned a score from 1 to 5 in the assessment of attractiveness, i.e. suitability of the coastal zone for beekeeping depending on their distribution. Minimum score was assigned in the event of presence of the least favourable plant community in the area subject to observation, while the maximum one was assigned to the areas with presence of the most favourable plant community. Data on the distribution of favourable plant communities were taken over from the General Vulnerability Assessment of the Coastal Zone – Biodiversity (flora and fauna). By combining the attractiveness and vulnerability grades for parameters selected in such a way suitability of the coastal zone for beekeeping was derived and is presented on the Map 6.

⁶ Data taken from internal research conducted by the Association of Beekeeping Associations of Montenegro.



Map 6: Suitability of the coastal zone for beekeeping

6.5.2 Guidelines

Sites with exceptionally good bee pasture should have a special treatment and be protected from conversion into construction land. They should be turned into reserves of certain sizes depending on the number and quality of honey-bearing plants in them. Beekeeping needs to be improved by / through: breeding selected queen bees and better health protection of bees; modernising technology; development of mobile beekeeping; making sure that health conditions and competitiveness of beekeeping products are improved; creating clusters; expanding the assortment of honey products; promoting organic beekeeping; raising the level of knowledge and technical capacities of the beekeepers, as well as by linking beekeeping and tourism.

To achieve the goals mentioned above, investments in the development of beekeeping should primarily focus on the following: construction and equipping of facilities for storage and processing of honey and other honey products; purchase of equipment for laboratories used to analyse honey and honey products; purchase of technological lines for honey packaging and processing; putting in place and equipping the bee fertilisation stations; and renovation and purchase of appropriate equipment for beekeeping.

6.6 Livestock Breeding

Livestock breeding is different compared to plant production in a sense that it is less developed sector in the coastal region. According to the MONSTAT data, there has been decline in the number of animals in the coastal zone.

Given the available resources, breeding of ruminants is of the highest importance for livestock breeding in Montenegro including its

coastal zone. Breeding of small ruminant (sheep and goats) has additional importance which is reflected in the use of low-productive and less accessible areas, as well as in the quality of products (meat and milk processed into traditional cheeses from this area which have good prices). Pig and poultry production is mainly organised on agricultural holdings to meet the needs of the very households engaged in these activities.

6.6.1 Suitability of the Coastal Zone for Small Ruminant Breeding

In general terms it can be said that livestock breeding has its own place in all the systems of organising agriculture together with plant production, regardless of the type of crops that are grown. The statement is also valid for the coastal zone. Pig and poultry breeding are exception as they represent industrial sectors of livestock breeding which do not rely on available land resources but are directly dependant on the market in terms of both procurement of inputs (primarily concentrated feed) and selling of finished products.

As for the **slope of terrain**, gentle slopes of 0-6% and slopes from 6 to 12% are suitable for breeding all types of ruminants, cattle, sheep and goats. On somewhat steeper slopes, from 12 to 25%, it is still possible to organise livestock production provided that the basic infrastructure is in place. On even steeper slopes, i.e. those exceeding 25%, basic infrastructure is as a rule in worse condition which makes construction of facilities difficult, and the same applies for growing and mowing of plants used as feedstuff in winter. Such terrains, unless they are located in remote areas, may serve for goat and even for sheep grazing. **Altitude** and sides of the earth which determine **sun exposure of the terrain** do not have direct impact on livestock breeding. However, sun exposure is very important for floral composition, yield and quality of pastures and areas in which the livestock graze.

Availability of **basic infrastructure** is even more important for livestock breeding than it is for plant production sectors since livestock breeding requires human presence on a daily basis and accommodation facilities which must be linked to transport infrastructure. Data on the existing distribution of livestock breeding and available resources of agricultural land show that the more attractive areas for livestock breeding are located in the municipality of Ulcinj, and partly in municipalities of Bar and Kotor (Grbalj area). Ruminants – sheep and goats in particular – have their place practically in all the parts of the coastal region / zone.

6.6.2 **Guidelines**

Land suitable for agriculture should be protected from conversion into construction land and a part of this land will also serve the purpose of livestock breeding. Goals in the development of livestock breeding in the coastal zone are structural adjustment, boosting competitiveness and productivity, introduction of innovation and new technological solutions, improvement of product quality and safety (in accordance with the EU standards), increased production of milk and meat for domestic market, encouraging and promoting organic farming and specific autochthonous products, joining producers in a cluster, strengthening the network for the buying up of milk and establishing stronger connection with processing industry, expanding the assortment of products and improvement of the level of extension services provided to producers.

To achieve the above-mentioned goals for the development of livestock breeding, investments in the sector's development should primarily focus on the following: renovation of the existing and construction of new barns, elimination of barriers to export to the EU countries, providing farms with necessary machines and equipment, improvement of genetic potential of animals, enhancement of meadows and pastures and

building necessary infrastructure, provision of buying out and collection centres for milk, procurement of vehicles for milk transport, promotion of the consumption of milk and milk products and introduction of the units for production of cheese and other dairy products, particularly traditional ones and those having high added value.

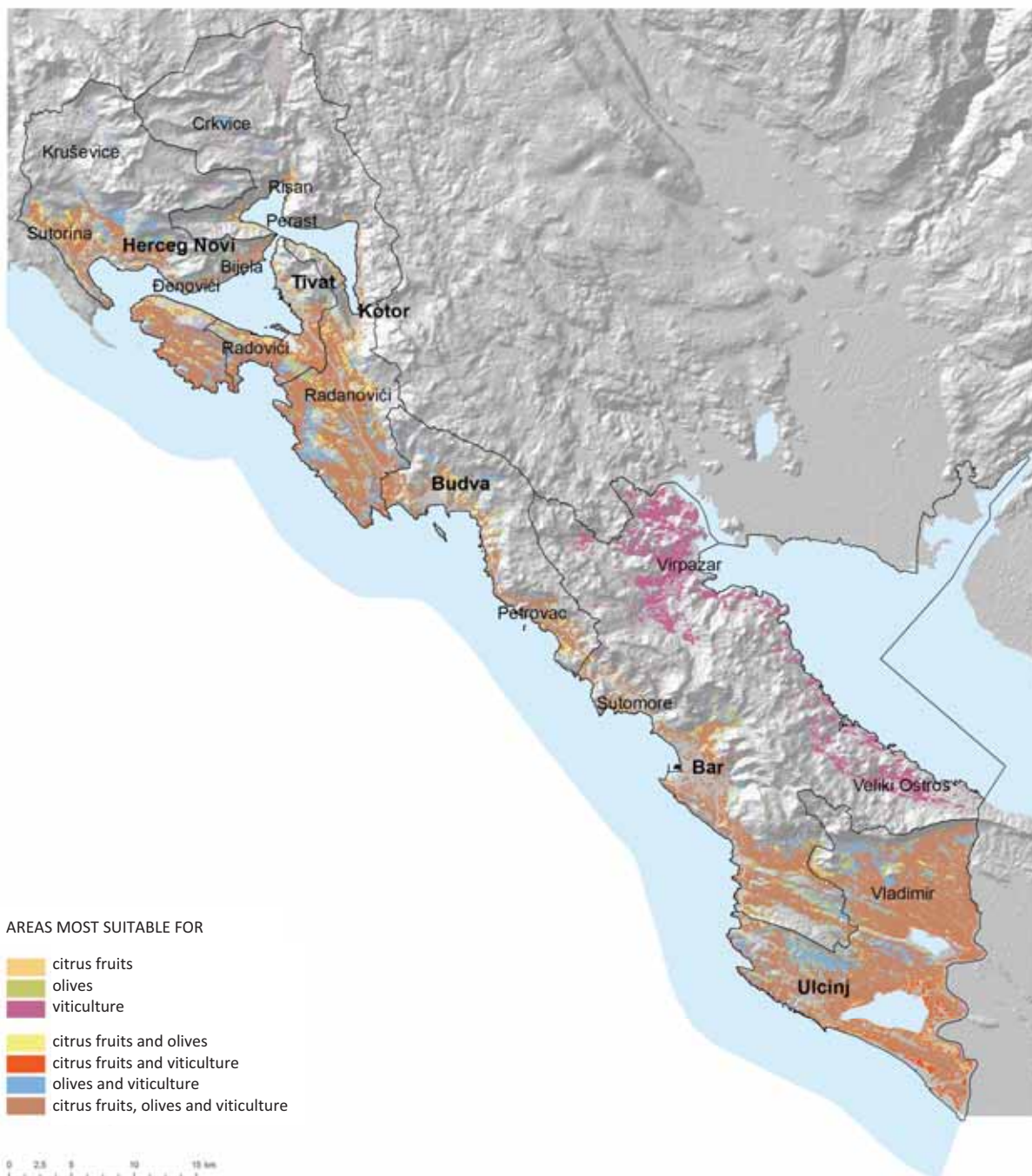
In parallel, work needs to be done on product branding, protection of geographic origin, improvement of sale and promotion of specific and autochthonous Montenegrin products in cooperation with hotels and restaurants. Moreover, investments should be made in research, while particular attention should be devoted to upgrading knowledge and skills by providing technical training and other services to the sustainable livestock breeding farms.

6.7 Priority Areas for Development of Individual Crops

Overlapping of the most suitable areas for olive, citrus fruits and grape vine growing is shown on the Map 7 below.

Prioritisation (determination of priorities) was conducted as an additional analysis for

overlapping of the areas suitable for growing of one or more crops. The purpose of this analysis was to identify priority areas for certain crops and determine whether dispersion of agricultural sector in the coastal zone in accordance with requirements of optimal and integrated development was justifiable.



Map 7: Overlapping of the most suitable areas (grades 4 and 5) for growing olives, citrus fruits and grape vine

Priorities are determined based on the following principle:

- where **there is no** overlapping of the most suitable areas (grades 4 and 5) for growing olives, citrus fruits and grape vine, the crop with these grades in the area in question is considered to be the priority;
- if **there is** overlapping of the most suitable areas for growing olives, citrus fruits and grape vine, priority is decided based on the factors that determine optimal choice of an area for individual crops, such as altitude, slope of terrain, distance from the sea and temperature.

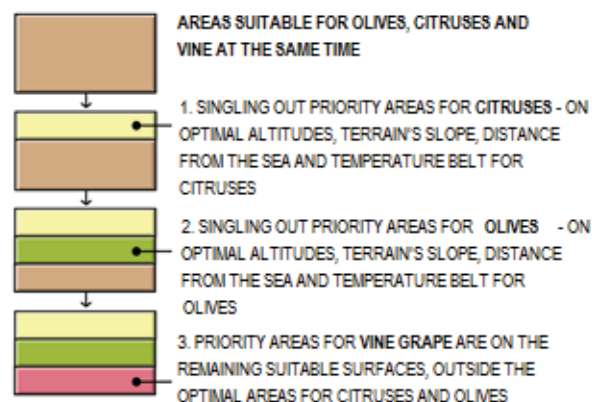
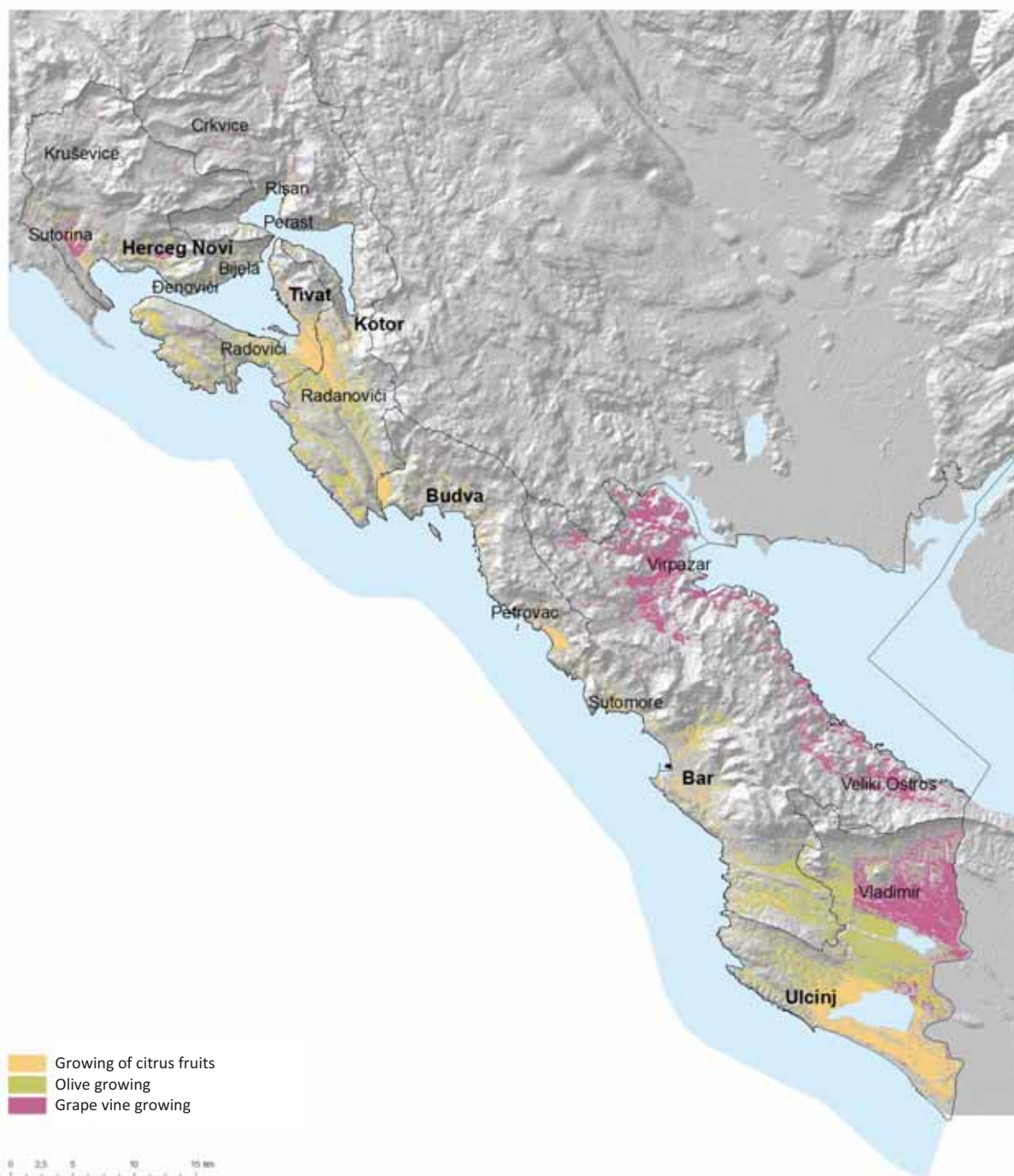


Figure 4: Method (steps) for identification of priority areas

Methods for identification of priority areas suitable for growing the analysed crops are presented in Figure 4. Spatial overview of the prioritisation results is shown on the Map 8 below.

It should be emphasised that the **data presented above show potential agricultural surfaces** and that areas which are currently not used as agricultural land are also encompassed. Data on the existing agricultural land were not used in the analysis since there is no good quality data in GIS format. The areas identified as suitable for agriculture also include zones where sound reasons for preservation of biodiversity exist (for example, Buljarica) and where establishment of agricultural land, together with amelioration of marshy terrain, would undermine the biodiversity protection goals. It is therefore not recommended to develop agriculture in these areas.



Map 8: Overview of priority areas suitable for growing the analysed crops

Spatial Development of Agriculture

7.1

Development Concept

Agriculture is an activity of priority significance for the coastal zone of Montenegro. The agricultural development concept should be based on the following:

- providing conditions for economically efficient agriculture which entails promotion and support to the products for which there is a market interest and are profitable, as well as active implementation of measures to improve characteristics of agricultural surfaces (amelioration, irrigation, consolidation of plots, etc.);
- enabling full manifestation of the multifunctional nature of agriculture and its flexibility, which assumes preservation of areas that offer conditions for the development of a number of agricultural sectors and additional activities, first and foremost of rural tourism and others;
- preservation of natural resources which includes rational land use and directing urbanisation towards areas that are less attractive for agricultural development;
- preservation of special landscapes that are important for the overall cultural heritage and have emerged as a result of traditional agriculture, whose future existence is possible only if there are well designed incentives for such agriculture.

The concept of **rural development** brings together agriculture's multifunctionality, its potentials, preservation of environment and of cultural landscapes as well as balancing of socio-economic disparities in the development of certain areas, particularly from the perspective

of preventing depopulation of rural areas.

Therefore, rural development lies at the core of the concept of integrated development of the coastal zone of Montenegro and is fully compatible with tourism development. Complementarity between agriculture and tourism becomes increasingly important, primarily due to the fact that it provides a broad range of local products and enriches tourism offer, while tourism is a strong driver of agricultural development as it promotes local cuisine and specific Montenegrin products. In this way, rural areas, i.e. cultural landscape and the values it offers become a significant element of recognisability of Montenegro as a tourist destination.

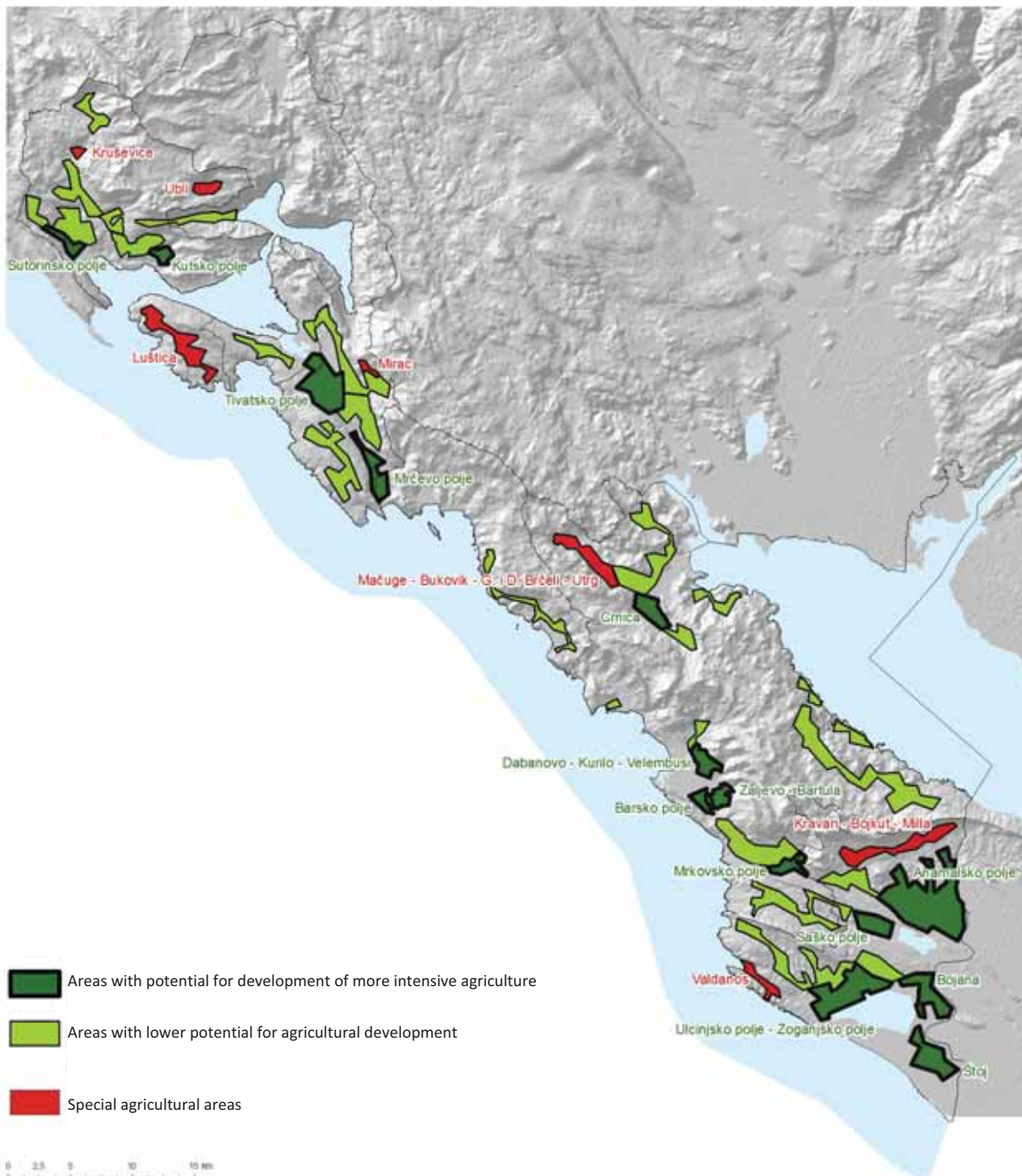
In order to preserve natural and landscape values of the coastal zone of Montenegro for the purpose of further improving its position as a tourist destination in the global market and stimulating rural development concept with a view to diversifying tourism offer, it is necessary to stop the so far practice of fragmentation of agricultural land and permanent destruction of valuable coastal forests by controlling expansion of the existing settlements and ending dispersed construction, including reduction of construction areas and directing construction to already urbanised zones.

In addition to the assessments of attractiveness and suitability of space for agriculture, results of **mapping the types of landscape character**⁷ were also used as a basis for preparation of the suitability concept, i.e. for identification of agricultural areas.

⁷ Landscape assessment study: identification and mapping the types of landscape which was undertaken during preparation of the SPSPCZ MNE, Planplus Ltd, October 2013

On the basis of the results of assessments of attractiveness and suitability of the space for agriculture, agricultural development may also be defined as the **concept based on singling out the three basic types of agricultural land**: areas with the potential for development of a more intensive agriculture; areas with lower potential

for development of more intensive agriculture; and special agricultural areas, with clearly set goals, priorities and flexibility in terms of growing crops and implementation measures. The illustration of such a concept is given in the Map 9, while reasoning behind it is presented below.



Map 9: Concept of agricultural development with basic types of agricultural areas

By observing factors that are important for agricultural development in the coastal area, it is clear that the biggest opportunities are linked to the fields of alluvial and alluvial-colluvial land extending from Herceg-Novi to Ulcinj⁸ (a total of 8,300 ha): Sutorina; Kutsko field; Tivatsko field; Crmnica; Mrčevo field; Barsko field; olive yards in the areas of Zaljevo-Bartula and Dabanovo-Kurilo-Velembusi; Mrkovsko field; Ulcinjsko and Zoganjsko field; Štoj; Šasko field; and Anamalsko field.

The fields mentioned above represent **areas with potential for development of more intensive agriculture** since there is the possibility to develop a number of agricultural sectors starting from intensive vegetable production in the protected area and in the open, to the cultivation of various multi-year plantations (of citrus fruits, grape vine, olives and other fruit species) and production of feedstuffs for breeding different types of livestock. These are areas that have the possibility for irrigation which additionally increases agricultural potential. At the same time, the strongest pressure from other sectors and a threat that they will be permanently lost for agriculture due to land-use change is evidenced exactly for these larger flat areas.

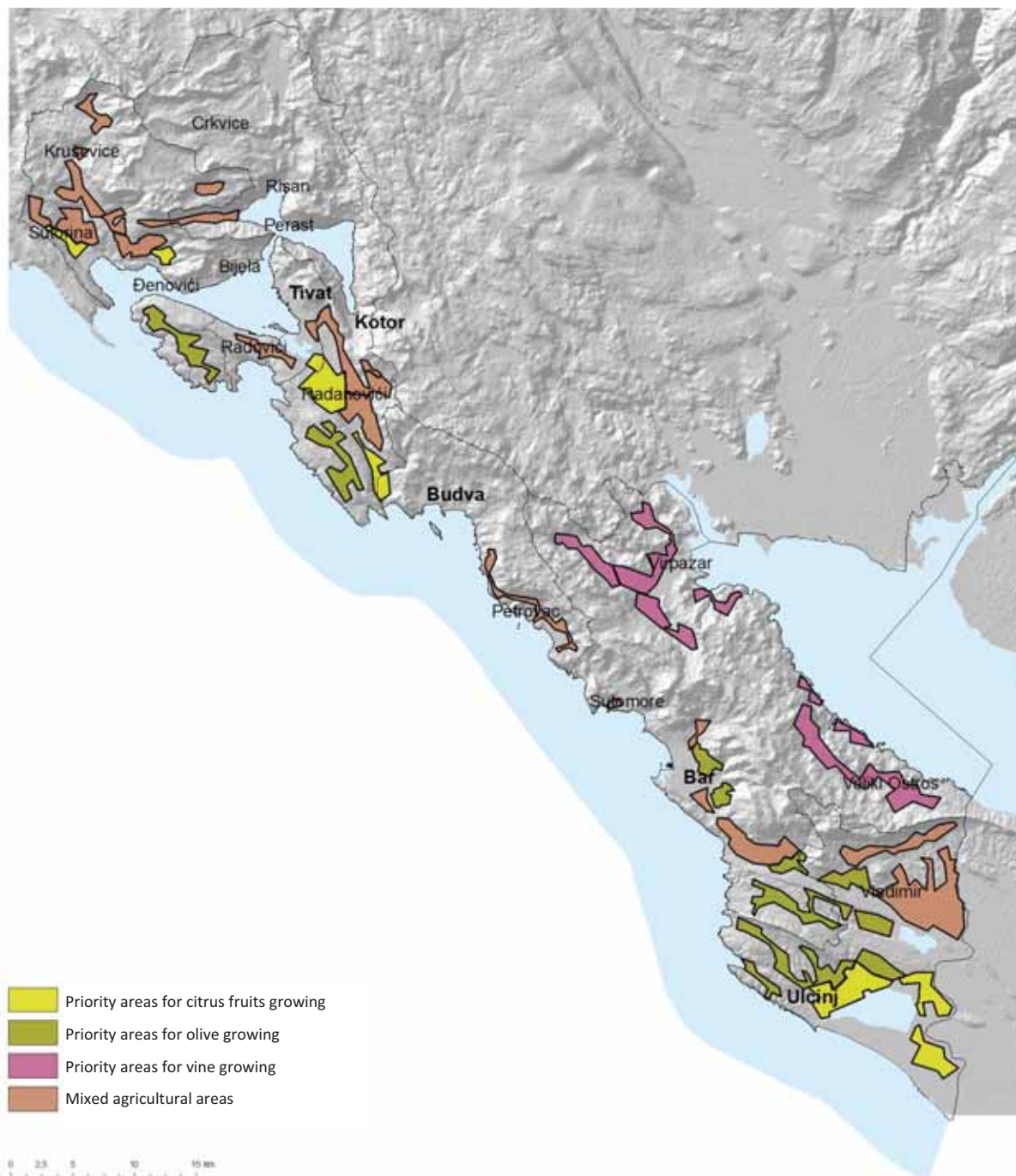
Conversion of agricultural into construction land does not cause harm only to agriculture, but it may also cause other negative effects such as: soil erosion, environment pollution, destruction of cultural heritage and reduction of the overall attractiveness of certain areas. As for the achievement of one of the fundamental goals of sustainable development regarding preservation of agricultural land as a natural resource, the conflict caused by conversion of agricultural land requires responsible approach in planning urbanisation at municipal and regional levels. Such an approach requires consistent limitation

of expansion of the existing settlements and of dispersed construction, including reduction of the construction areas and directing construction towards already urbanised zones.

Besides the areas mentioned above, the **areas with lower potential for agricultural development or with certain natural limitations (Map 9)** are important as well. They are located mainly in peripheral areas of fields, on terraces and plateaus on the flysch and karst terrain. Larger surfaces of such terrains are located in the area between Bar and Ulcinj (Velje selo and the surrounding fields, Mala Gorana and Velika Gorana, Pečurice), in Grbalj area (Zagora, Krimovica, Kovači, Bigova) and Luštica (Klinci and the surrounding area, Gošići, Radovanići, Merdari). These areas are also specific for their traditional organisation of the living and agricultural space. Agriculture is still important in these areas despite somewhat more difficult conditions for cultivation, while it also overlaps with other activities, i.e. land uses.

By applying the concept of assessment of attractiveness and suitability of space for agriculture, **special agricultural areas** are also identified. Among other things, they are recognisable and specific for their importance for preservation of the overall cultural heritage and landscape character since they in fact emerged as a result of traditional practices in cultivating and maintaining agricultural land (arranged olive yards, terraced areas, etc.). The following areas might fall in this group: olive yards in Valdanos and Luštica and traditional agricultural land in the areas of Kruševice, Ubli, Mirac, Mačuge - Bukovik - Gornji and Donji Brčeli - Utrg, and Kravari - Bojkut - Mila. Continued existence of these areas in the future is possible only if incentives for agriculture and rural areas are used and if the measures that will prevent land-use change are consistently implemented.

⁸ This is potential size of the mentioned areas, while precise determination of their size is possible only by redefining land use in spatial plans (Chapter 7.2) and detailed records on their condition (Chapter 7.3).



Map 10: Spatial distribution of the most important agricultural sectors

Integral part of the concept of development of olive, citrus fruit and grape vine growing, beekeeping and small ruminant breeding are measures for **improvement of characteristics of agricultural land**. These primarily refer to the following:

- building irrigation systems in order to use water from the Bojana river and Šasko lake, and also building wells and reservoirs;
- prevention of floods on the banks of the Bojana river by building new and raising some of the existing dikes that are used for protection;

- amelioration, drainage and drying up of marshy land next to the Bojana river and in the areas of Naluško field in Buljarica, drainage of parts of Tivatsko field and chemical amelioration of salinised parts of Ulcinjsko, Naluško and Tivatsko fields.

When selecting the type of production, an extremely important factor, besides available land resources, is the **market**. The so far practices indicate that family agricultural holdings will continue to play a dominant role, while there are also possibilities of establishing larger, commercial plantations of citrus fruits and vineyards. In the context of development of commercial production which requires greater quantities of agricultural products, it is vegetable production in the protected areas that stands the best chances since it does not require large surfaces of agricultural land and protected areas (polythene and glass greenhouses) may be installed relatively close to the biggest consumer centres. Proximity of the coast line and need to expand tourism offer will increasingly **encourage numerous family agricultural holdings** to combine agricultural production with tourism and provision of different services which will be an additional factor contributing to the sustainability of agricultural production on relatively small family estates.

7.2 The Level of Harmonization between the Results of the Attractiveness and Suitability Assessment of Space for Agriculture with Guidelines on Agricultural Development in the Existing Spatial Plans

Various documents contain substantially different estimates of the existing agricultural land that should be preserved, its potential and size. Moreover, it should be kept in mind that the land categories stipulated in these documents are not fully comparable, especially

having in mind differences in estimates of existing and potential surfaces of agricultural land:

- analysis of the synthesis land-use map (RIUDP, 2013) shows that 16,089 ha of agricultural land are identified in the plans of six municipalities of the coastal zone; comparison of data (synthesis map, orthophotos and suitability analysis) shows that these areas do not coincide with the actual conditions and potentials ;
- according to the Spatial Plan of Montenegro, 11,900 ha in the coastal zone should be preserved as the zones of intensive agriculture, of which 8,900 ha in Vladimirsko and Ulcinjsko fields and around 3,000 ha in the parts of Grbaljsko, Mrčevo and Tivatsko fields;
- according to the Statistical Yearbook (2012) published by MONSTAT⁹ there is a total of 51,017 ha of agricultural land in the coastal zone (the major share or 75.1% is covered by meadows and pastures followed by 12.3% of gardens and arable land, 10.6% of orchards, 1.5% vineyards and 0.6% of ponds, fishponds and reeds) which means that intensively farmed land (gardens, arable land, orchards, vineyards) totals 12,448 ha;
- from the materials prepared in the framework of the General Vulnerability Assessment (Fuštić, 2012) based on official data and analyses contained in the existing scientific and technical papers, a conclusion can be drawn that the available land potential is around 12,000 ha of alluvial and alluvial-colluvial land of the coastal fields and coves and around 15,000 ha of terraces

⁹ Data on surfaces, fruit trees, vine plants, production and domestic processing are collected through regular annual reports of agricultural organisations (agricultural enterprises and farmers' cooperatives), based on accounting and other types of records of these organisations. As for private agricultural holdings, data on surfaces are estimates based on general cadastre evidence and thus the figures on surfaces, fruit trees, vine plants, production and domestic processing on private holdings are estimated.

and plateaus on the flysch and karst terrain, totalling 27,000 ha;

- the results of mapping the types of landscape character (Study on landscape analysis: identification and mapping the types of landscapes for the purpose of preparation of the SPSPCZ MNE, Planplus Ltd, October 2013) indicate that the total surface of land types that may be considered as agricultural land (excluding pastures on the hills) amounts to 18,890 ha, of which fluvial-glacial plains spread on 270 ha, traditional fields on moraines with settlements on another 64 ha, traditional agricultural fields with settlements on 10,235 ha, traditional agricultural terraces with settlements on 1,142 ha, coastal and flood-alluvial plains on 3,607 ha and traditional terraces with olive yards on 3,572 ha (Map 9);
- based on the results presented in this document which are derived from the Assessment of Attractiveness and Suitability of the Coastal Area of Montenegro for Agricultural Development, it may be concluded that the total area of land suitable for agriculture amounts to 44,630 ha, of which the areas that are simultaneously highly suitable for all the analysed crops (olives, citrus fruits and grape vine) amount to 21,187 ha.

The above information shows that it is, unfortunately, not possible to determine exact quantitative (numerical) indicators based on collected data. The lack of good data on land use in GIS poses a significant problem for carrying out assessment of the existing spatial conditions, monitoring land-use changes, monitoring quality of planning processes, as well as for the application of the instruments proposed below to implement results of the attractiveness and suitability assessment for agriculture. **To that end, efforts should be made to**

establish systematic records, registries and database in GIS format.

7.2.1 Overview of Agricultural Land in the Existing Spatial Plans

The overview map of agricultural surfaces according to their use derived from the land-use synthesis map developed for the preparation of the SPSPCZ MNE (RIUDP, July 2013) does not correspond with the actual situation, as can be clearly seen from the Figure 5. There is a considerable number of larger sections of agricultural land, in particular small coves and agricultural land on terraces, for which spatial analysis carried out in the framework of this attractiveness and suitability assessment showed they were attractive, while as in the synthesis map they are classified and depicted as *forests, shrubland and other undeveloped areas* category. Moreover, some steep, rocky and forest areas have been included in the agricultural land area. Such a depiction distorts analysis of the existing conditions and makes it difficult to observe changes in space, planning processes and application of the proposed instruments.

With this in mind, **data on agricultural land surfaces presented below based on the land-use synthesis map should be taken with caution since they do not reflect the actual scope of agricultural land.**

The second problem is **the way in which rural settlements are defined**. Land-use category called *mixed use areas* from the land-use synthesis map also includes large surfaces of agricultural land around developed rural centres, while as for some smaller settlements construction areas are not determined at all. All this inevitably leads to division of agricultural land into plots and to dispersed construction.

In the future generation of spatial plans, designation of agricultural land must be

harmonised with the actual conditions and potentials (on the basis of this and other detailed assessments of attractiveness and suitability which should be carried out at municipal levels during preparation of municipal spatial plans). It is also justified to include less significant sections of agricultural areas (coves,

terraces) into the planning category of agricultural land. Consideration should be made to differentiating the areas that are significant for development of intensive agriculture, i.e. the most significant agricultural surfaces (arable land, vineyards, orchards) from meadows and pastures.

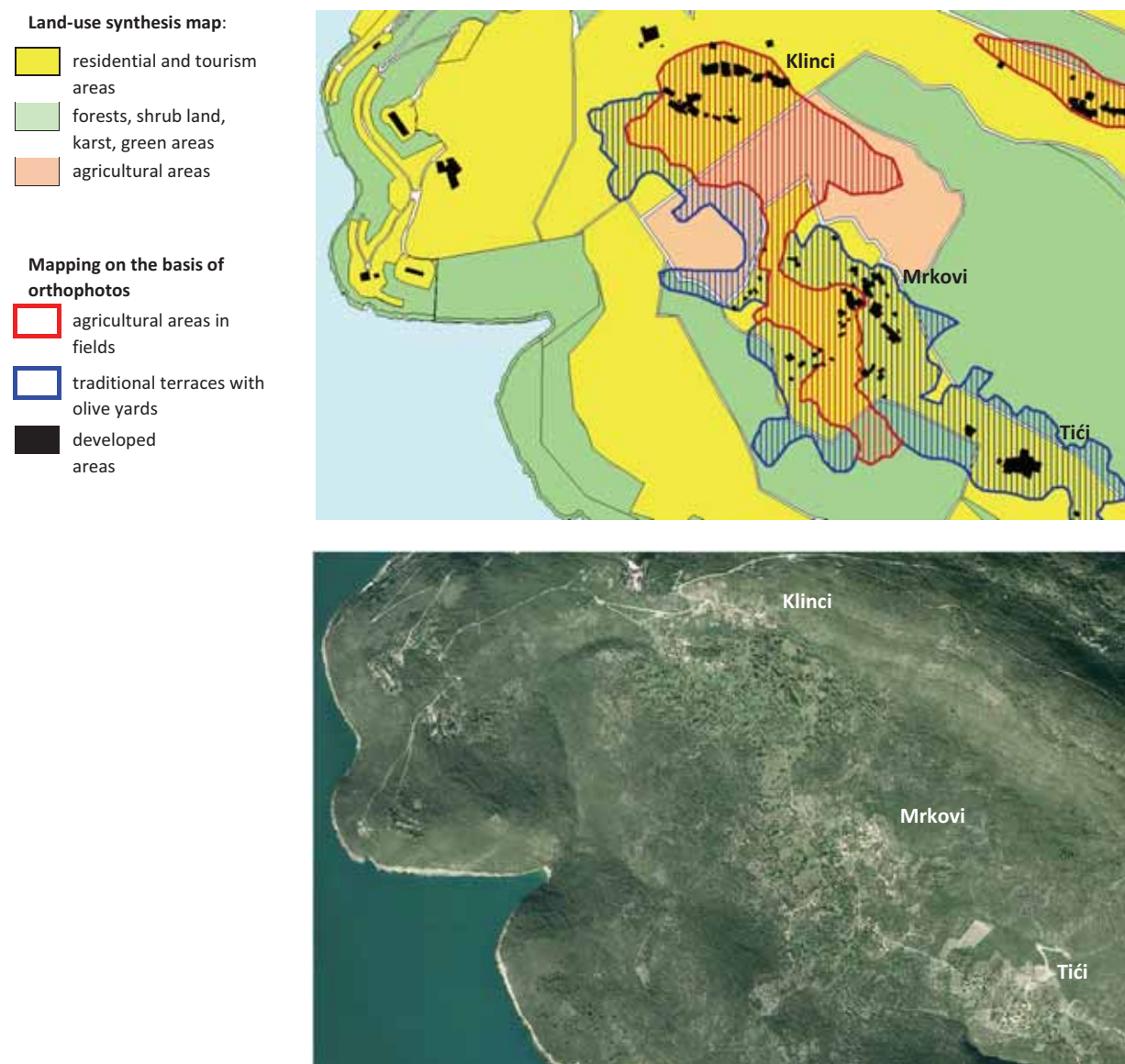


Figure 5: Illustration of a lack of harmonisation between agricultural land uses as defined in the existing spatial plans (based on the land-use synthesis map developed for preparation of the SPSPCZ MNE, July 2013) and established actual conditions of agricultural surfaces based on orthophotos (Source: Google Earth, 2013) – example of a selected section in Luštica)



Map 11: Overview of how the areas most suitable for agriculture compare to agricultural areas designated in the spatial plans (based on the land-use synthesis map developed for the purpose of preparation of the SPSPCZ MNE, RIUDP, July 2013)

7.2.2 Conflicts between Planned Urbanisation and Potentials for Agricultural Development

The assessment of attractiveness and suitability confirmed conclusions drawn in the General Vulnerability Assessment (CAMP Montenegro, December 2012) **which found out that spatial planning directions for future urbanisation were to a significant extent in conflict with potentials for agricultural development.** One of the reasons is the above presented unrealistic depiction of agricultural areas in the existing spatial plans. Zones of conflicts (with surfaces of more than 50 ha) between undeveloped construction areas and areas that are (either entirely or partly) suitable for agriculture are presented below. Other conflict areas identified in the General Vulnerability Assessment are not presented but are shown informatively in the Map 12. Numbering order of conflict areas for which the source of conflict is linked to their agricultural use is taken over from the numbering order in the general overview of conflict areas in the General Vulnerability Assessment.

Municipality of Herceg-Novi

2. Kruševice:

- area planned for residential development;
- the zone is too large, it is justified to limit construction area to the periphery of the field, while leaving central part of the field for agriculture;

3. Kruševice (south of the settlement) and

4. Mokrine – Kameno:

- areas planned for residential buildings;
- the zone is too large and includes different spatial entities, i.e. land uses; it is justified to concentrate construction areas to the zones of existing settlements in a way which preserves sections of agricultural land and forest communities;

5. Prijedor – Mojdež and 6. Ratiševina - Trebišinj:

- areas planned for residential buildings;
- zones are too large and include different spatial entities, i.e. areas of the existing land uses so it is not justified to open new areas where there is no settlements; construction area should be concentrated to the zones of the existing settlements in a way which preserves sections of agricultural land and forest communities;

7. Sutorina:

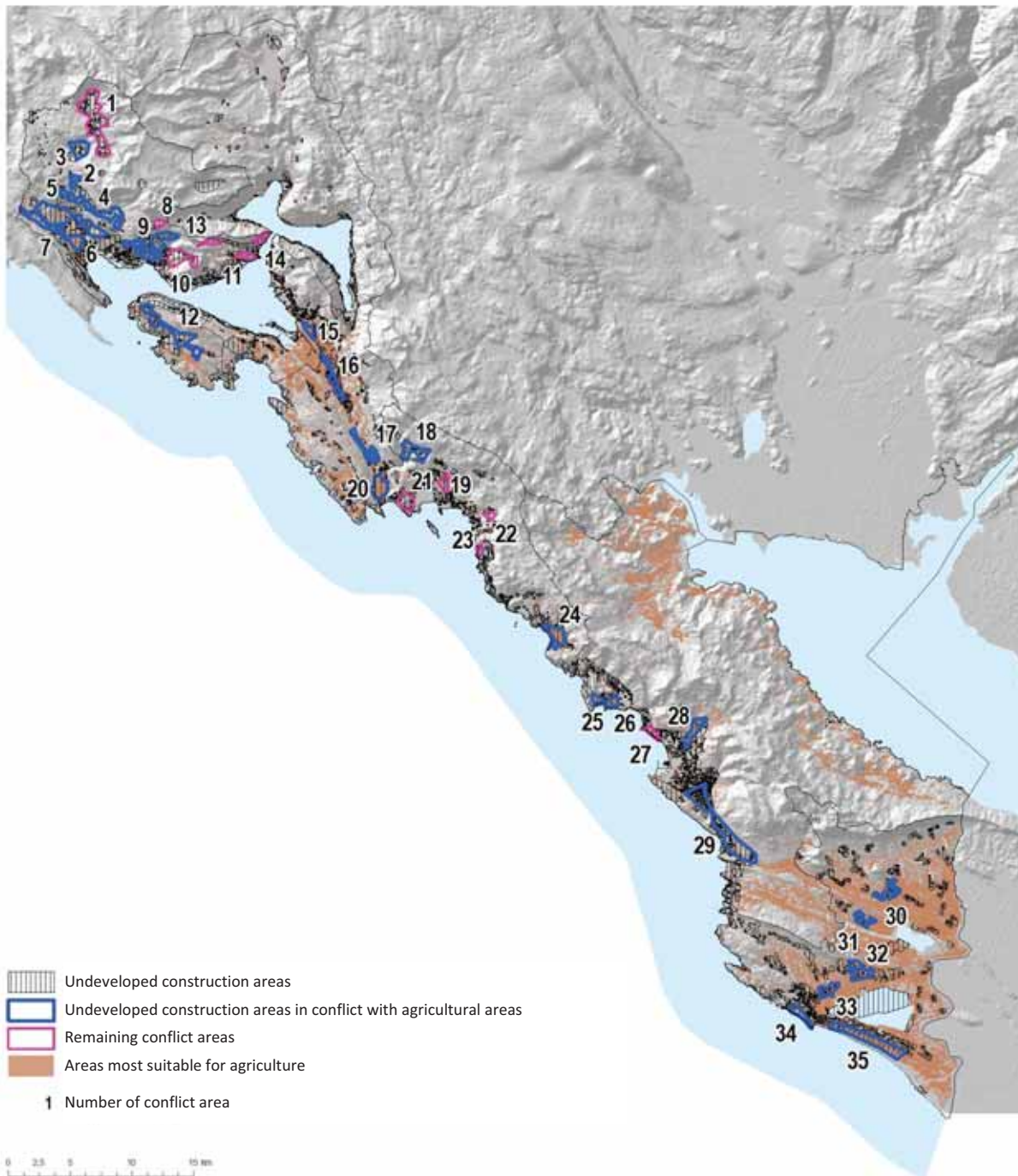
- area planned for residential buildings and mixed use;
- area of high vulnerability and conflict with potentials for agriculture so it is justified to preserve it for agricultural use; construction area should be concentrated to the zones of existing settlements in the way which preserves sections of agricultural land;

9. Podi - Šašovići - Kudi:

- area planned for residential buildings;
- the zone is primarily in conflict with biodiversity preservation (presence of forest community *Orno-Quercetum Illicis* which is particularly important for biodiversity of the coastal Mediterranean areas) which limits expansion of construction areas into the hinterland with preserved nature, but also with potential for agriculture so it is justified to limit construction areas to the smaller units;

14. Luštica:

- areas planned for residential buildings;
- area planned for residential buildings extends over a large surface; construction area should be concentrated on the zones of existing settlements in the way which preserves agricultural land;



Map 12: Larger areas of conflicts between undeveloped construction areas and areas that are (either entirely or partly) suitable for agriculture

Municipality of Tivat

15. Mrčevac:

- area planned for mixed use;
- area of agricultural land of high importance (nevertheless the area should be considered

in the context of a very limited space for the development of Tivat);

Municipality of Kotor

16. Radanovići and 17. Gorovići – Lastva Grbaljska:

- area planned for residential buildings; mixed use, tourism and technical infrastructure;
- area of agricultural surfaces important for agriculture; it is justified to preserve completeness of Tivatsko field and concentrate construction areas on the periphery of the field;

Municipality of Budva

18. Pobori:

- areas planned for residential buildings;
- the zone is in conflict with biodiversity preservation (which may limit expansion of interventions into the hinterland with preserved nature) and with agriculture on traditional terraces so it is justified to limit construction area to the smaller units;

20. Mrčevo field:

- area planned for tourism;
- area of major investment of national importance;
- the zone is in conflict with the area of agricultural surfaces of special importance which should lead to limitation of construction in the zone; certain impact of sea-level rise in the area of Jaz beach should be taken into account;

21. Buljarica:

- area planned for tourism;
- area of major investment of national importance;
- the zone has potential for agricultural development too, but the land-use conflict is primarily linked to preservation of nature and protection of biodiversity since this is a wetland area protected under Article 10 of the ICZM Protocol and in line with Ramsar Convention;

- in that regard, the planned scope of intervention in case of construction of new tourism capacities is questionable since the necessity to preserve the most important natural and landscape characteristics should be kept in mind;

Municipality of Bar

26. Spičansko field (Sutomore):

- area planned for tourism and residential buildings;
- vulnerable area with potential for agriculture (however, the area should be also considered in the context of the development of Sutomore);

28. Zupci and 29. Barsko field - Dobre vode:

- area of mixed use and for residential buildings;
- Barsko field and its peripheral areas are characterised by dispersed construction which completely fragmented agricultural land of otherwise good quality; despite that, it is justified to reduce construction areas and limit it to peripheral zones of Barsko field, especially in the direction towards Dobre vode (there are large reserves for new construction in terms of filling up and completing the existing construction areas);

Municipality of Ulcinj

30. Vladimir, 31. Donja Klezna, 32. Zoganje and 33. Kodre – Kolonza:

- areas of agricultural land of outstanding importance;
- construction areas should be limited in a way which prevents further fragmentation of agricultural land and construction should be concentrated to border areas of complete agricultural sections;
- guidelines are also valid for the other settlements of Ulcinjsko, Šasko and Anamalsko fields;

35. Velika plaža:

- first and foremost, the area is important from the perspective of nature protection and biodiversity preservation (as it hosts sand dunes with halophyte vegetation, grassland and coastal forest habitats), which limits the planned scope and type of interventions; northern part of that area is also attractive for agriculture;
- in that regard, planned scope and type of intervention in case of construction of new tourist capacities is questionable since necessity to preserve the most important natural and landscape characteristics should be kept in mind.

Table 5: Surface of the areas of conflict between undeveloped construction areas and areas that are (either partly or entirely) suitable for agriculture

Conflicted area	Surface of the area (ha)
HERCEG NOVI	
2. Kruševice	652
3. Kruševice	48
4. Mokrine – Kameno	263
5. Prijevor – Mojdež	332
6. Ratiševina – Trebišnj	163
7. Sutorina	265
9. Podi – Šašovići – Kudi	334
TIVAT	
14. Đurići	62
15. Mrčevac	82
KOTOR	
16. Radanovići	49
17. Gorovići – Lastva	114
BUDVA	
18. Pobori	176
20. Mrčevo field	182
21. Prijevor	144
BAR	
26. Sutomore	70
28. Župci	144
29. Barsko field – Dobre vode	651
ULCINJ	
30. Vladimir	106
31. Donja Klezna	98
33. Žoganj	230
34. Kodre – Kolonza	118
36. Velika plaža	453
Total	4.736

The table 5 gives an overview of undeveloped construction areas (in six municipalities of the coastal zone) that conflict with agriculture and the size of these areas expressed in hectares.

If the construction takes place in all the above-mentioned conflict areas, around 4,700 ha of the existing agricultural land and land that is potentially suitable for agriculture would be lost.

These analyses indicate there is a need to precisely identify agricultural land in spatial planning documents in order to, amongst other things, avoid planning of construction areas in the zones that have valuable nature and attractive resources. Planning of construction areas that are several times larger than what is actually needed has numerous negative consequences which, amongst other things, include unnecessary consumption of particularly valuable agricultural and forest land, dispersed construction that requires considerably longer transportation network and more expensive provision of utilities, loss of traditional physiognomy of settlements and disturbance of original landscape values. The SPSPCZ MNE should therefore enable rational use of the space in the coastal zone primarily by considering possibilities to reduce the scope of construction areas, particularly in the conflict zones.

7.2.3 Valuation of Rural Open Areas within the Coastal Zone

As a part of further elaboration of the areas suitable for agriculture in the coastal zone, detailed analysis and identification of a system of valuable rural, open and predominantly natural areas were performed; for these areas it is recommended that they are not included in the intensive urban and tourist development flows.

Rural areas have a number of characteristics that make them exceptionally valuable. In economic terms, these are the areas where almost the entire production of food and other renewable resources that meet the needs of entire population is located. In environmental terms, rural areas are areas with valuable ecosystems. If observed from social and cultural aspects, rural areas preserve tradition of co-existence between humans and nature (UNDP, 2013).

Data on at least 10,000 ha of uncultivated arable land, more than 10,000 officially unemployed in the coastal zone and on import of agricultural products to Montenegro in which olive oil and citrus fruit imports alone account for some EUR 3 million, speak of the potential for rural development in the coastal zone. According to performed analyses, there is a realistic potential for creating around 2,000 new jobs and generating revenue of around EUR 50 million per annum in ecological and traditional farming, rural and adventure tourism and accompanying service sector alone. Unlocking this potential would result in employment growth of around 4% in the coastal zone and would also contribute to the GDP growth of 3-4%.

These projections include only agricultural production and tourism capacities of predominantly family type, while intensive agricultural production in the fields such as Anamalsko, Ulcinjsko, Zoganjnsko, Tivatsko, Barsko, Mrčevo, etc. is not included. Moreover, it should be emphasised that it is only the tourism region with developed traditional rural offer that may provide autochthonous experience and adventures (gastronomic, enologic, cultural, educational, adventurous...) expected by a modern tourist. Therefore, rural areas and rural economy make an important part of the attractiveness basis as well as an important segment of the high quality tourism offer on the coast.

It is particularly important to use available funding from the pre-accession funds (IPARD) for

major share of this rural development component (diversification of rural economy through multifunctional rural development). Financial allocation from these funds for Montenegro in 2012 and 2013 was around EUR 11 million. The amount will increase in the coming period and after the EU accession it will be several times higher.

Through valuation of rural areas, the areas and space of outstanding importance were identified for the purpose of their preservation and sustainable rural and tourism development. Areas with limited and non-renewable resources such as valuable arable land or limited ecologically significant natural resources such as forests and waters were targeted. Equally important treatment was given to areas with outstanding landscape values and areas of valuable biodiversity (already protected ones or those with the status of potential protection).

In order to use the obtained data in the simplest possible manner, and having in mind prescribed contents of the spatial plan, all the output data are structured according to the types of cartographic representations for preparation of which they may be used. The first group comprises layers that resulted from identification of areas characterised by valuable arable land or valuable forest cover. Since these categories are shown in land-use maps, their grouping was conducted in that way. The same refers to water surfaces, while other natural areas do not have pronounced values and potential such as agricultural land or forest.

The second group comprises areas that are identified as valuable landscapes or breaks in developed areas that are important from landscape perspective, including valuable ecosystems and protected areas (the existing and potential ones). These areas also have pronounced value as well as resource dimension. They are usually represented in maps which set conditions for protection and use of the space (regimes).

The third group comprises areas whose specific characteristics pose restrictions for development in space and they also usually presented on maps which set conditions for protection and use of the space.

One of the goals of valuation and identification of valuable open areas is to optimise land use, particularly in order to avoid having construction areas in the zones with outstanding values which should be protected (exceptionally valuable areas in terms of biodiversity and landscape) or used in accordance with their fundamental value as a natural resource (agriculture, forestry). Final synthesis spatial layer enables identification of valuable open areas that lie within construction areas. In this way it is possible to identify concrete potential conflicts between the identified spatial values and valid planning guidelines.

Taking the approach described above enables exclusion of certain areas from urban development when there are clear and convincing arguments to that end. It is evident from the process that these arguments serve long-term interest of sustainable development of the coastal zone.

7.3 Instruments of Implementation

Instruments to implement results of the assessment of attractiveness and suitability of the space for agricultural development include a set of diverse measures and activities related to:

- spatial arrangements (in the sense of spatial planning);
- agricultural development;
- implementation of certain national level policies: agricultural policy and agricultural development planning, measures involving regulation of use and protection of agricultural land, planning and performing agricultural operations, harmonisation of rural development policy measures with green development, etc.;
- local government measures.

Data on the existing conditions

Lack of reliable data on land use in GIS poses serious problem when carrying out analysis of the current situation, monitoring changes in space, and monitoring quality of planning processes, but also when it comes to application of instruments proposed below for implementing the results of the assessment of attractiveness and suitability of space for agriculture. Therefore, it is necessary to start with systematic preparation of records, registries and database in GIS format and in particular to:

- analyse existing situation and actual problems;
- establish digital records on planned and actual land uses, where classification should include information about the land uses relevant for agricultural activities (meadows, pastures, yards, family gardens, vineyards);
- establish digital records on the quality of agricultural land.

Integration of agriculture into the Special Purpose Spatial Plan of the Coastal Zone of Montenegro

Integration of agriculture into the Special Purpose Spatial Plan for the Coastal Zone of Montenegro should primarily encompass the following:

- support to rural development and stimulating agricultural development as fundamental starting points, along with the commitment for further development of tourism as a foundation for integrated development of the coastal zone of Montenegro;
- depiction of areas with potential for more intensive agriculture, less intensive and extensive agriculture as well as of special agricultural areas in the graphic part of the Spatial Plan;
- planning development and individual activities at the regional level in a way which preserves significant agricultural areas;

- directing urbanisation towards areas that are less attractive for agricultural development and in a way as to round up the existing settlements.

Agricultural areas in Municipal Plans

Identification of agricultural areas in municipal plans should include the following:

- overview of agricultural land which is harmonised with the actual conditions and potentials (on the basis of this and other detailed assessments of attractiveness and suitability of the space for agriculture carried out at municipal levels); it is justified to include smaller and less significant sections of agricultural land (coves, terraces) in the planning category of agricultural areas. Separation of areas of intensive agriculture and the most important agricultural land (arable fields, vineyards, orchards) from meadows and pastures should be considered;
- directing urbanisation towards areas that are less attractive for agricultural development and in a way as to round up the existing settlements;
- consistent implementation of the *Rulebook on more detailed form and content of a planning document, land-use criteria, elements of urban regulation and unique graphic symbols*, and particularly of Article 76 under which identification of optimal construction areas should be based on the principles of sustainable development, protection of natural potential and landscape characteristics as well as on expert arguments and quantified surfaces of developed and undeveloped parts of settlements, while recognising, amongst other things, the following guidelines:
 - possibility of construction within the existing construction areas (reserves of space) should be examined up front, especially in case there are parts that are not completed; capacities of the existing

infrastructure and buildings serving public functions should be kept in mind in the assessment;

- housing and population densities should be adjusted according to the type of settlements;
- construction areas should be shaped according to geo-morphological and hydrological preconditions to form separate units of the settlements;
- introduction of the strict moratorium on new urbanisation in areas having potential for more intensive agriculture outside of settlements;
- identification of agricultural areas in which conversion of agricultural land is possible only in exceptional cases in the sense of more restrictive preservation of some areas.

At the same time, active land administration policy should be implemented at the local level. This includes consolidation of land plots (re-arrangement of the existing distribution of plots including redistribution of ownership), directing construction towards construction areas equipped with utilities and infrastructure, establishing stock of land owned by a municipality and tax measures for which competent authorities are municipalities (for instance, tax on undeveloped construction areas).

Rural areas and their development

Very important aspect for sustainable development of the coastal zone of Montenegro is integration of valuable parts of the coast (for which adaptation of the set back is not proposed) with the neighbouring areas in their hinterland which should, due to landscape, natural and other values, remain in their natural condition and become part of the open space system in which intensive urbanisation is not planned. As mentioned earlier, these are areas with predominantly rural characteristics in which future construction would be predominantly linked to the traditional settlements or activities of agricultural households and processing of

agricultural products. Part of the system of open spaces are areas with fertile soil and valuable traditional cultural landscape whose preservation represents a basis for multifunctional rural development in which agricultural production is combined with tourism offer (agro-tourism) and different forms of outdoor recreation. Potential of rural, open areas and their resources presents development opportunity that opens up possibilities for development of diversified economy in the coastal zone.

Optimisation of land uses for predominantly rural areas should be achieved by: setting specific requirements for spatial development with the aim of preserving rural values, reducing or putting an end to dispersed and unrealistically planned construction areas, while observing inherited rights; and increasing the level of efficiency in carrying out the investments in the singled out zones outside of settlements by applying instruments which set deadlines (to a specific period of time) for investors' rights stemming from the adopted spatial plans.

Incentives for agriculture and rural development

Important measures that have effects on agriculture first and foremost include tax policy, credit and social policies and regional development policy. Following example of the EU Common Agriculture Policy, incentives are implemented uniformly across the entire Montenegro in accordance with the legislation. Still, it is important to emphasise that a lot of work remains to be done to establish a functional system for implementation of all the measures.

In addition to numerous measures of direct support to producers at the national level, efforts should be continued to find opportunities for favourable agricultural loans from resources of the Investment Development Fund. Alleviations should be also offered for

employment in agriculture through the Employment Office.

In the implementation of rural development measures municipal co-funding is allowed and even desirable (which is different from direct support measures) and should be used by coastal municipalities to enable preservation and development of their rural areas. Agricultural holdings and local communities will be also able to use funds from the fifth component of the EU accession assistance (IPA) for rural development under IPARD programme (support to investments in primary agricultural and processing industry and for diversification of rural economic activities).

The majority of measures are adopted and implemented at the national level. However, considerable share of rural development measures (co-funding the majority of measures and particularly creation and improvement of living conditions in the countryside by building local infrastructure) actually falls within the competence of local communities through activities and actions undertaken by local action groups and municipal administration. Therefore, local communities should build and strengthen local implementation capacities, but they should also advocate for consistent implementation of measures at the national level.

The novelty introduced in the EU CAP for the programming period 2014-2020 refers to possibilities for **agriculture in the areas facing any kind of limitations** (worse conditions for agriculture due to altitude and/ or lower soil quality, areas included in protection programmes – national parks, nature parks, etc.) to be financed also from the first pillar in the framework of what is known as the **greening payments** (funds allocated to farmers for the purpose of "greening" agricultural sector, i.e. as a compensation for the preservation of agricultural land while undertaking agricultural activities) in addition to support through rural development measures. The new concept in CAP

(2014-2020) recognises and appreciates local specificities to a greater extent. This will be favourable for Montenegro's agriculture as a whole and also for farmers in the coastal zone. An important challenge will be understanding and speed of transposition of the EU concepts, harmonisation of domestic legislation and consistent application of measures which will be suitable for a wide range of farmers, but also for entrepreneurs from other sectors who organise their business activities in rural areas.

Programme of performing agricultural operations (improvement of the characteristics of agricultural land)

In order to improve land characteristics, which are fundamental prerequisites for agriculture, the following operations should be performed: soil amelioration, drying up and drainage of swamps where that does not conflict with the biodiversity preservation goals, chemical amelioration of salinised parts of fields, as well as land consolidation in the areas where fragmentation of plots makes efficient production impossible.

Establishing stock of land owned by state or by municipality

Urbanisation and construction of infrastructural facilities result in a considerable loss of agricultural land. Some holdings, and particularly those where agriculture is the main source of income, can be seriously affected by such changes. In case there is a need to provide land as a form of compensation for lost surfaces (if the owners of affected holdings intend to continue with agricultural activities in the future), securing a stock of state or municipally owned land is a reasonable solution. Such land can be leased to the households which do not have sufficient land of their own, and also for the purpose of dislocating households which become "trapped" within urbanised areas thus finding themselves in conflict with the use of the surrounding space.

Inspection

Consistent enforcement and inspection supervision have an important place in the overall policy of preservation of agricultural land and agricultural development. The following are particularly important: harmonised/ joint supervision by agricultural, inspection for the protection of space, construction and environmental protection inspections; control of interventions carried out on agricultural land - illegal construction, illegal processing, i.e. environmental impacts of agriculture (use of phyto-pharmaceuticals, tolerance of invasive plant species, use of prohibited plant species, etc.).

Tax Policy

Beside tax breaks in agriculture, consideration should be also given to the introduction of taxes on conversion of agricultural into construction land, while funds generated in this way would be allocated for programmes designed exclusively for the improvement of agricultural land characteristics.

Soil Management

A prerequisite for sustainable soil management is development of the Rulebook on land management at the local level and mandatory development of the Land Management Study in the course of development of National Location Studies (NLS). The main objective of such an approach is to prevent uncontrolled use and degradation of the fertile part of soil of the best quality (humus). The surplus of such soil that results from the construction of new buildings should be used for remediation of areas with degraded soil, improvement of lower quality agricultural land and different developments at the national level.

Operational programmes and target oriented projects

Development of operational programmes for different crops (for instance: operational

programmes for olive growing, citrus fruits growing and growing of other crops, development of organic farming, etc.) should be stimulated.

Education and awareness raising on the importance of agriculture

In addition to the existing regular and occasional education programmes in agriculture, it is also necessary to intensify programmes related to specificities of crops grown in the coastal zone. Moreover, having in mind limited agricultural resources, particularly in the coastal zone, it is necessary to work on awareness raising of population from the earliest age.

Market development mechanisms

Sustainable development of agriculture in the coastal zone should be based on transition from the centrally planned to market economy where responsibility of individuals is in focus. New integration processes will have even greater influence on the change of economic conditions which will be reflected in further market liberalisation which requires higher level of competitiveness. In order to boost competitiveness of Montenegro's agriculture it is necessary to work on improvements of the structure of enterprises, quality standards, marketing of agricultural products and foodstuffs, capital and land markets, education and professional advancement of farmers.

Development of modern market channels requires involvement of small producers and engagement in boosting competitiveness of processing capacities which will be able to increase production by finding new markets. There is a high level of competition in Montenegro which is, amongst other things, due to unattractive investment area. However, accession to the EU and EU membership, as well as existence of a joint regional and rural development system based on decentralisation and increased possibility of using EU and other types of funds may contribute to elimination of

these barriers and development of modern market chains.

Opening of the European Union market for agricultural products and foodstuffs from Montenegro and entire network of bilateral trade agreements (CEFTA, WTO, etc.) would create conditions for the transformation of Montenegro into net exporter of certain products (wine, olive oil, citrus fruit, vegetables, etc.). Olive, wine and citrus fruits growing may be extremely profitable sectors with significant export potential which means that measures should be undertaken to intensify production of these crops, modernise and specialise processing capacities, while ensuring good marketing and logistic support.

Sustainability of agricultural sector may have considerable impact on expanding the tourism sector offer. In fact, tourists visiting Montenegro express increased interest in authentic agricultural products which is why efforts should be made to establish connection between farmers and hotels, restaurants, tourism organisations, etc. Furthermore, tourism in rural areas has unbreakable ties with agriculture since interest in organising visits to rural areas is increasing. This gives people in rural areas the possibility of generating additional income. Secured sales of agricultural products would also have impact on cost cutting in rural tourism sector and would enable revitalisation and stability in the development of rural areas.

Stimulating development of the financial market and better access to loans would contribute to the reduction of specific risks related to availability of credit for farmers, so the banks would increasingly find their market among owners of agricultural holdings. Support of the banking sector would contribute to the reduction of risk factors in agriculture which could have direct impact on levelling up of yields and product quality, which could in turn directly impact the purchase price of products.

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CAMP Montenegro is a programme implemented jointly by United Nations Environment Programme Mediterranean Action Plan (UNEP/MAP) and the Montenegrin Ministry of Sustainable Development and Tourism (MSDT), with the involvement of local governments from the project area and of other relevant institutions.

The main objectives of the CAMP Montenegro include:

- creation of necessary mechanisms that can help achieve sustainable development of the coastal area;
- support for the implementation of national policies and the ICZM Protocol of the Barcelona Convention;
- promotion of integrated and participatory planning and management in the coastal area;
- development of national and local capacities for ICZM and raising awareness of the importance of the coastal area, complexity and fragility of its ecosystems and of the need for integrated approaches in managing them;
- facilitation of the transfer of knowledge on ICZM tools and approaches.

The main output of the programme is the ICZM Strategy and the Plan for Montenegro.

