

On the basis of Article 68, item 5 of the Constitution of the Republic of Macedonia and Article 22 paragraph 1 of The Law on Spatial and Urban Planning (Official Gazette of the Republic of Macedonia No. 4/96, 28/97, 18/99, 53/01 and 45/02). The Assembly of the Republic of Macedonia, on its Session held on 11 June 2004, has adopted

S P A T I A L P L A N
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I. BACKGROUND

The need to develop the Spatial Plan of the Republic of Macedonia has resulted from the emerged socio-political, economic and strategic changes in the country and its neighbourhood, as well as from the expired planning period of the preceding Spatial Plan, adopted in 1982 with time perspective until 2000, which assumes review and redefinition of determinants, conceptions and directions set therein.

The adoption of the Programme for the Spatial Plan of the Republic of Macedonia development and adoption by the Government and by the Assembly of the Republic of Macedonia, on 22 March 1995 and its publication in the "Official Gazette" No. 17 of 28 March 1995, initiated preparatory activities related to the development of the Spatial Plan of the Republic of Macedonia.

The development of the Spatial Plan was assigned to the Public Enterprise for Spatial and Urban Plans, within which Expert Working Team for the Plan development was established.

The Plan related work commenced with inventory taking of the entire documentation of relevance to the space planning process produced so far. It was systematized by areas, with details on documentation contents, developer and location. Inventory taking indicators and space valorization criteria (starting ground for the further process of analysis and planning) were defined. Methodology and organization for the Plan elaboration was developed in line with the latest scientific and expert knowledge and globally accepted trends.

In accordance with the proposed methodology for the Spatial Plan elaboration and the Programme for the Spatial Plan of the Republic of Macedonia development and adoption, the Plan elaborates the following five basic topics:

1. Analysis and assessment of conditions and trends;
2. Previous planning solutions and extent of their implementation;
3. Long-term goals and objectives of the space organization and use;
4. Long-term planning concepts for individual areas;
5. Rules for the Plan implementation and appropriate monitoring.

For the purpose of such based planning document, i.e. definition of the planning concepts, the planning process was organized through the following phases:

1. Phase of draft Plan;
2. Phase of proposal Plan.

The draft Plan phase was reviewed and verified by the Government of the Republic of Macedonia. The proposal Plan phase was adopted by the Government of the Republic of Macedonia and by the Assembly of the Republic of Macedonia.

Twenty expert studies developed by numerous experts and institutions in all areas of relevance to the Plan constitute the grounds for the elaboration of the synthesized concept of the national space organization, development and use, in terms of its expert and scientific support, i.e. the Plan documentation.

In the process of analysis, valorization and definition of concepts for the space development, and indicators at municipality level were used, according to the territorial division before and after 1996, depending on data availability and nature, and in line with the level of this planning document. Each future territorial organization of the State will be implemented in the Plan, while results achieved will be presented in annual reports under the process of the Plan implementation monitoring.

On the basis of the proposed development concepts for individual areas of relevance to the space development, synthesized concept of the organization, development, use and protection of the space of the Republic of Macedonia was developed and presented in a form of draft Plan, comprising the following areas/sectors: protection and use of natural resources (agricultural and forest land, waters, mineral and energy resources); population distribution; development and planning of urban and rural areas; spatial organization of public functions; management of industry distribution; infrastructure development and distribution (water management, energy, transportation, and telecommunication systems); development and organization of tourist areas; protection of the environment and natural resources and conservation of immovable cultural heritage, guidelines and measures for protection against war destructions, natural and industrial accidents and technological disasters and activities related to the Plan implementation.

The activities under the draft Plan were monitored by the Coordination Body established by Decision of the Government of the Republic of Macedonia, while the conception presented therein was assessed by the Review Committee composed of distinguished experts from the country in all areas of relevance to the spatial planning.

The draft Plan, in accordance with the relevant legislation, was subject to expert debate involving all relevant stakeholders in terms of assessment of the planning solutions and concepts, local self-government and general public.

Suggestions, comments and proposals resulting from both the Review Committee and expert debate were considered by the Plan developers and some of them, supported by reasonable and justified positions, were incorporated in the Proposal Plan in an appropriate manner.

The long period between the adoption of the draft phase and review and adoption of the proposal phase of the Plan imposed the necessity for supplementing the current conditions in the spatial organization and review of concepts and solutions for long-term development and planning of the territory of the Republic of Macedonia.

1. THE PLAN SCOPE AND TASKS

The Spatial Plan is a management document, an integrated development project by its nature, by means of which spatial organization of the country and goals and concepts of spatial development for individual areas, as well as the conditions for their implementation, are defined.

The Plan is oriented towards identification of ways and possibilities for complex spatial problems and conflicts settlement, through interaction with development processes, trends and constraints. Therefore, the Plan is problem oriented, but not only towards current problems, but also towards problems that are long-term in time perspective, the settlement and elimination of which has a strategic dimension within the development and space functional integration. Consequently, the Spatial Plan is defined as document of lasting values, to be harmonized with all development documents that will be developed and adopted.

Owing to its stressed strategic development connotation, the Plan defines and clearly specifies the basic and in time feasible goals and directions of development, especially with regard to qualitative and quantitative structural changes and related and adaptable space planning solutions and options.

Apart from strategic development, the Plan also has a spatial integration nature which is, actually, its primary task. It coordinates complex physical structures of primary, secondary, tertiary and public activities, their location and allocation in

space. The processes of integration in the national space require common interactive and harmonized functioning of infrastructure, production and public services in time and space, with necessary observation of continuity in the environment preservation, protection and improvement.

Regional disparities and uneven development have been evident within the space of the Country. This is reflected, before all, in the distribution of the population and demographic trends vis-a-vis natural potentials, level of economic development, social capacities and infrastructural network. This state is further burdened by disparity between material production and level of public functions development.

The settlement of some of these problems, which are by many aspects within the domain of the Spatial Plan, is possible through formulation of strategy for space development and creation of conditions for proper distribution of certain activities and functions.

The Spatial Plan, as development document of longer time perspective, pays particular attention to regional and inter-regional aspects of the development, before all through demographic policy that can be articulated and implemented operationally only in the context of the policy of territorial, i.e. regional development. The primary approach of the Plan is development and integration, rather than adaptable in terms of adaptation of the spatial organization to the development trends in the policy of development.

On the basis of the monitoring of the implementation of the former Spatial Plan (adopted in 1982), the status of development and adoption of spatial planning and urban documentation for individual regions, municipalities, areas of special purpose, urban and other settlements and the extent of their implementation, the overall assessment (diagnosis) of the state has been expressed

in general, without major investigation, and then checked and confirmed through more detailed partial researches.

The above stated overall, preliminary assessment of existing problems and trends was necessary to set goals and establish methodological approach towards further planning process.

Based on identified general conditions and trends in the Country, the Plan defines the main goals to be achieved through settlement of problems noted in the space organization, use and development and environment protection.

The overall direction and control of the development of Macedonia certainly requires elaboration of several mutually harmonized long-term strategies, in line with the norms and the criteria applicable in other areas, such as: economy, social life, culture, environment, etc. It should be noted that the National Strategy for Economic Development of the Republic of Macedonia has been already developed and presented at the beginning of 1998 and it is one of the foundations for setting the concept of the spatial development, or it acquires, to some extent, spatial effectuation in the Strategy for Spatial Development, i.e. Spatial Plan of the Republic of Macedonia. Starting grounds and directions in the domain of environmental protection within the Spatial Plan are established by the National Environmental Action Plan, developed and adopted in 1997.

On the basis of the generally set goals, the Plan specifies the general assumptions as well, i.e. offers integrated consistent solutions with regard to the preservation of the original development resources, early reservation of the space, its protection and early purpose structuring in order to avoid future conflict situations or at least neutralize the existing ones.

Special attention is devoted to the segment of the Plan implementation. Apart from solutions provided in the Plan, it elaborates the procedures for the planning

goals and concepts implementation, and the Law on its implementation has been adopted together with the Plan.

The Spatial Plan is of long-term nature, with a time horizon till 2020. However, it is founded on the principle of flexibility and adaptability of development processes and structural changes that will inevitably occur in near future. This stresses that the Plan is a process prone to constant active adjustment of planning solutions with the developments in practice and identification of optimal solutions for the purpose of preserving the integrity of the space and its quality.

2.THE PLAN MAIN GOALS AND ASSUMPTIONS

The basic strategic determination of the Spatial Plan of the Republic of Macedonia is the achievement of higher level of the overall functional integrity of the space in the Country, as well as facilitation of conditions for significantly greater infrastructure and economic integration with neighboring and other European countries.

The achievement of higher level of integrity of the space in the Country assumes reduction of regional disparities, i.e. quality changes in spatial, economic and social structure, especially in areas with emphasized malfunctions of social and economic development.

The main assumptions upon which balanced development is based include:

1. Observation of realistic factors of development.

2. Undertaking of incentives by national and other funds and other kinds of support to programmes of local communities and business entities.

3. Establishment of market principles and appropriate institutional framework within which market institutions will be able to operate.

4. Creation of regional differentiated management climate through the support by the relevant policy.

The long-term development of the Republic of Macedonia will to a great extent depend on the changes that need to take place in the political system and on the establishment of politically stable conditions in the Country, on the implementation of essential undertakings in the economic system, on the enhancement of reproductive capacity of the economy, restructuring of the economy, higher economic efficiency, improvement of the financial standing of the State, provision of additional accumulation, etc.

The economic performance of the Republic of Macedonia in terms of efficient and timely adaptation to those changes will influence the possibilities for maximization of positive effects and neutralization of certain negative impulses originating from the extreme surrounding.

The adaptation of the national economy to the European market is necessary, considering the fact that the European Community is important external trade partner, and integration processes in Europe will result in long-range economic and other implications on future cooperation. The involvement of the economy of the Republic of Macedonia into integrated developments in Europe has been conditioned by the commencement of the process of economic restructuring, introduction of modern technical and technological solutions and international standards. The national economy, due to limited accumulation and need for intensified economic development and changing of unfavorable economic structure will remain liable to utilization of additional accumulation from abroad.

It is also necessary to overcome the one-sided attitude towards industry as the only factor of development and to adjust the former type of urbanization manifested through concentration of the population in a low number of centres and inappropriate development of social and personal standard, i.e. adequate urban equipment.

In the domain of urban centres system development at national level, efforts are made to reduce the relative concentration of the population and activities in the Country's capital, i.e. to achieve quality changes in their socio-economic structure, through intensified utilization of construction funds, land and positional advantages, expert, scientific and development potentials available thereto. Part of this strategy is related to the fostering of appropriate programmes aimed at improving the quality of living in the settlements, as well as at stimulating the development in smaller towns. Demetropolization (selective transfer of certain governance, administrative, economic, cultural and other functions and activities from the capital to other towns), does not assume blocking of its development, but rather a necessity for high quality transformation of spatial and socio-economic structures.

One of the goals of this Plan is the development of rural settlements and areas as multi-functional productive, social and cultural areas and strengthening the economic ability of rural households, because the more balanced development of the area of the Country may be accomplished only through qualitative changes in rural areas.

It is necessary to mobilize more zones and make them more attractive for situation of business facilities and population compared to the current state and tendencies. This refers, before all, to areas possessing significant potentials (both natural and man-made) and relatively good transportation position and accessibility.

The development of underdeveloped, hilly, mountainous and border areas is based on the integrated development, which assumes a combination of factors, such as: natural, demographic processes, transport and other infrastructure and suprastructure.

Investment decisions related to material production strictly observe location, technological, economic and environmental criteria adopted at national level. Programmes of public functions and valorization of existing networks have been adjusted to economic development, financial possibilities and specific features of local communities, as well as to the development goals for individual areas. Programmes for public functions development assume appropriate support in other sectors as well (first of all, in transportation infrastructure).

One of the main goals of the Spatial Plan is related to saving, sustainable use and protection of natural resources, especially of those that are scarce and strategically important to the development and to the quality of living in the Country. The overall balance of water resources, as well as their distribution in time and space, requires exceptionally careful use through comprehensively secured system of protection against pollution and unplanned use. One of the priority goals of the Spatial Plan is to protect agricultural land, especially through strict limitation of undertakings involving land of I-IV quality class transformation into non-agricultural land, as well as preservation of soil quality and natural fertility. Equal importance is attached to forestation, re-forestation and forest quality enhancement.

It is necessary to establish efficient control over the construction land use and development, and to adopt regulations and standards for building and public service provision in settlements. In order to reserve areas for sustainable building and utilization of facilities and areas of public interest in time, protection of corridors for infrastructure building, areas for ores exploitation, areas for accumulations erection, as well as areas with protected natural and immovable cultural assets, shall be provided.

The efforts for natural and cultural values protection and quality of living improvement in the Country place special accent on the protection and the improvement of environment. The state of the environment and environmental demands are significant limiting factor in the planning of economic activities. Protection and promotion of valuable natural resources and major areas of specific purpose and natural values of importance for biological diversity and for the quality of the environment are of particular importance, and so is the protection and the promotion or the adequate treatment of cultural heritage in line with its cultural and civilization meaning and importance.

The Spatial Plan provides for timely reservation of corridors for infrastructural systems. Taking into account the costs required for their construction and the current economic ability, the accent has been placed on technical upgrading of existing systems, as well as on their performance improvement.

The basic strategy for the space organization and use, in terms of supporting the economy development, consists of spatial solutions facilitating the following:

- greater attractiveness of the space and wider selection of solutions, from location point of view, for investments of domestic and external capital;
- territorial differentiation of development policies, measures and instruments;
- protection of natural and man-made resources and wealth, in the context of economic interests aimed at maintaining the quality of the environment;
- transportation, information and management connection, as precondition for the more efficient production and social development;
- development of spatial and environmental information system;

- flexibility with regard to locations in investment decision making.

3. GEO-STRATEGIC CHARACTERISTICS OF THE REPUBLIC OF MACEDONIA

3.1.ELEMENTS OF SPATIAL AND FUNCTIONAL STRUCTURE DEFINITION AND POSITION OF THE REPUBLIC OF MACEDONIA

Determinants and links of the Republic of Macedonia in Europe's constellation

In the frames of the implementation of one of the missions of the European Space Development Perspectives (ESDP), special and outstanding role is attached to those regional spatial development initiatives and schemes involving individual Member States of the European Union and individual candidate countries for Union's membership. As early as in preparatory stage of the ESDP, the European Commission raised the regional initiative titled *INTERREG II C*, in order to support trans-national cooperation in the area of spatial planning of Europe's countries and regions (i.e., not only in the Union's Member States).

In this context, *ESTIA* and *OSPE* are the two leading regional initiatives in the domain of spatial and urban development and environmental policy of the Balkans.

- *ESTIA* – European Spatial and Territorial Integration Alternatives, a Strategy and Policy for Integration of the Spatial Development in South Eastern Europe. The following countries participated in this project: Albania, Bulgaria, Greece, Macedonia, Romania and Federative Republic of Yugoslavia;

- *OSPE* – Observatory for Spatial Planning in South Eastern Europe is a project complementary to the above one and involves the same countries.

- *Programme and spatial and functional links at Balkans level*

There are no major programmes for spatial harmonization of future development at the level of spatial and functional organization of Balkan countries, except certain initiatives (Balkan Countries Conference). This poses a serious problem that will probably undergo radical positive transformation. We should also expect overcoming of alternatives of spatial determinants, manifested in the current dilemma faced by Balkan countries: *Mediterranean* or *Danube*, or *Black Sea* or *Balkan* orientations in future development, as those are not incompatible, but complementary alternatives, i.e. they enhance development opportunities.

External links of the Republic of Macedonia of relevance to space organization and development planning

External links include all direct links of the Country with neighbouring countries, as they manifest the most direct relations as parts of the obligations to develop good neighbourly relations and intensive exchange and cooperation with the surrounding.

Almost all existing documents of interest for this issue elaborate the substance of links and relations with relevant countries exclusively on the basis of the principles of identification, analysis and solutions to technical issues, such as: border crossings, hydro-technical protection, tourist trade, etc., but this is far from satisfying substantial demands for development of future integration elements and links.

Certain bilateral agreements with neighbouring countries still lack sufficiently precise elements that could be integrated in the concept of the future spatial organization of the Republic of Macedonia, thus leaving space for offering all categories of development links, instead of their inert expectation.

As far as the proposals for integrated spatial and functional linkage of the Republic of Macedonia with its

surrounding are concerned, it is less difficult to prove the comparative advantages of such cooperation through utilization of natural, social, economic, production, infrastructure and other values of each participant, than those related to the overcoming of political and organizational issues and planning of future harmonized development.

It may be concluded that it is hard, but not impossible, to accomplish cooperation in the said context, as it is not related only to the development of certain tangent parts of the country, but also to a wider spatial functional reinforcement that should lead to a minimum extent of adjustment.

Directions and nature of expected links of the Country with its surrounding

Despite the overall social, political, economic, geographical and other distinctiveness, Europe tends towards greater general harmonization of its spatial organization at macro level. This means that European countries take seriously the needs and the possibilities for expressing their participation in this continental constellation through higher extent of harmonization of their macro-functional structure. This assumes development of relevant activities and modes of settlement adequate to certain natural conditions and historical circumstances.

It is not realistic to expect that any European country will discard characteristics and specific features of its development through forthcoming elements of the modern structure of industrial development. However, it is an inevitable fact that this cannot be accomplished through absolute autochthonous approach by each state spatial community, as more and more conditions are being posed by the emerging integration relations, such as:

- One comprising the structural orientation of each country towards the area of activities facilitated by the current

and the future trends, such as industrial production, agriculture, tourism, etc.

- The other one refers to the fact that the connection of infrastructural systems plays more and more important role that should respond to the demands for transportation, trade, energy, water supply, etc., at significantly higher quality level.

Presentation of expected trends in the anticipated urbanization in Europe indicates certain important factors that will condition the future spatial and functional organization at global level. This includes, above all, the inherited geo-morphology and texture of this continent and distribution of directions aimed at easy and rational management of the large infrastructure.

Taking into account the forecasts of the possible trends in Europe's urbanization, it may be concluded that the Republic of Macedonia is not at the periphery in the domain of functional distribution of the European space. The development of the Country is strongly influenced by the macro-spatial functional orientation of Europe towards Mediterranean, Danube area and Balkans, as well as by the inter-continental connections (Europe-Asia).

Apart from numerous natural and functional regional arrangements used by European countries in the context of association for various purposes, there is a formal regionalization, "Danube Region" – development axis. Within this region, adjoined through technical interventions with the natural grounds of Rajna, Majna and Danube Rivers, one of the main sections has been acquired, with realistic prospects of becoming an important development axis in the central part of Europe. However, in addition to the mentioned channel line, we should also mention the section that is expected to enable functional connection of the northern part of Europe with the Aegean Sea through linking with the River of Odra and its area, i.e. southern part, on one side,

and introduction of Morava-Vardar channel heading, on the other.

The anticipated development of spatial infrastructure refers to the basic technical categories, such as: hydro-systems, railway systems and road communication systems. Most of the other infrastructure, i.e. primarily energy infrastructure, retains the same lines as the above systems, thus influencing the urban concentration, that is the creation of the future "Europolis" with its forms and concentrations.

Definition of major transportation infrastructure has determined the axis and the poles to be established on the basis of their functional domains and levels of development. The anticipated global functional regionalization of infrastructure networks reflects at the same time the desired extent of integration of Europe's regions, requiring involvement of each country with its own functional structure. In this way, Europe will become a unique infrastructural, urban and industrial continent.

In the coming period, the category of infrastructural systems will be the most intensive form of spatial and functional integration and it is realistic to expect that the whole Europe will be covered by a significantly more harmonized network of sub-systems of roads, railways, channels, oil pipelines, long-distance power lines, gas pipelines, etc. There will be significant differences in the domain of frequency and capacity of certain functions in certain regions of the European space. Their overcoming is conditioned by timely identification of functions that can be offered by each Member State to the European constellation as spatial and functional entirety.

As far as the closer surrounding of the Republic of Macedonia (Balkan Peninsula) is concerned, one may conclude that there is actually no main development axis. It has been replaced by urban facilities of "X" shape (south-east and

north-west directions); out of these, only one – the southern branch – is of purely Balkan nature. It passes from Belgrade, through Nis and Skopje to Thessalonica, and through Sofia to Constantinople (Istanbul). Based on this, the consideration of expected trends in urbanization should pay greater attention to the integrated inter-connection of all Balkan countries' centres and major parts of their territories.

In the course of the future development period, it is expected that the Balkans become a large building site where development projects at European and global levels will be implemented, in the areas of agriculture, industry, energy and other activities.

The proposed orientation of common infrastructural systems to support the Balkans development has been made on the basis of the assessment of European macro-regional development trends.

The basic parameters to direct the future development of the Balkan area include the concept, according to which its development axis and centres should be re-positioned at its legal territory, as they are now placed at its peripheral, border areas. By transferring the development axis, the area of the Balkans would have access to three seas and thus seize more adequate position compared to the current one.

Particular benefit from the orientation of the infrastructural connection within the future development of Balkan countries will result from the increased share in the distribution of European functions, considering production, operational and other activities in this area. This has been taken into account as one of the pre-conditions for the installation of new production facilities intended to reduce migration movements from this part of Europe.

3.2 TRANSPORT AND GEOGRAPHICAL POSITION AND POTENTIAL IMPACTS ON THE NATIONAL SPACE DEVELOPMENT

Theoretical and methodological determination of spatial planning as a

process imposes the obligation for more complex, comprehensive and multi-layer explorations and considerations of the impacts of geographical position on the space organization, development and use. This evolves, before all, from the necessity of linking the past and the present with all dominant effects expressed through various forms of movements, impacts and relations.

The space planning approach, theoretical, empirical and methodological knowledge respect and adequately evaluate all relevant components and dimensions of the geographical position of the Republic of Macedonia. This position is not only a foundation of the international system of relations and links in the space, but it is also one of the key factors with direct and indirect influence on the establishment and activity of the system, i.e. on the space organization and development. External geographical impacts originating from international closer and wider surrounding, taking also into account different conflicting geo-strategic interests and apparent or hidden intentions, act interactively on the formation of internal spatial structures, contents and relations, that are of exceptional or determinant relevance in spatial and functional terms. While taking into account the complex historical development determined and conditioned impacts from the international surrounding affecting to a great extent the transportation geographical position, and through it, other relations (economic, demographical, social and national, civilization, military and political, geo-strategic, etc.), it is necessary to identify the relevant impacts, their strength and intensity.

The Republic of Macedonia belongs to the group of the smallest countries in Europe, with a total surface area of 25.713 km². It occupies an area of diverse physical and geographical characteristics and natural properties and resources. With its central position on the

Balkans, the Republic of Macedonia is closest to Thessalonica Gulf, around 80 km from its southern and around 300 km from the northern border, i.e. to the Aegean Sea. Therefore, Republic of Macedonia is South European Country although it does not have direct access to sea. The River of Vardar has its headwaters in and passes through the territory of the Republic of Macedonia, carrying strong integration potential in its composite valley and representing spatial and functional pillar in terms of inter-connection and inter-linkage of the whole Balkans. Merged with the Morava Valley, Vardar corridor becomes the most frequent line and a skeleton that should be used in a rational and efficient way, both in spatial and functional context, due to the fact that the biggest and most complex urban agglomeration system in the country has been established in this very area.

The old relief structures enable easy communication with neighbouring political and physical geographical regions, and through them with the Asian continent on east and with the Apennine Peninsula on west.

The above described physical and geographical constellations of the Country have facilitated, from historical point of view, cultural, civilization, ethnic and religious interweaving of western and eastern, northern and southern influences, but also separation and isolation of such influences.

In addition to the above constellations, we have to point out (from geo-strategic point of view for Macedonia) the size of the territory, contents of the space and their qualitative components, such as: relief, which is diverse and dynamically distinctive, favorable pedological cover, relatively well developed hydrographic network and different climate conditions, as well as inadequate infrastructure equipment and communication capacity, affecting directly

the system of space use, organization and development.

From geo-strategic point of view, the geo-strategic position of the Republic of Macedonia is latent, as it provides for development and prosperity in peaceful periods, and conflict of interests and conquests in war conditions, which have been factually confirmed through history for several times.

The central position on the Balkan Peninsula and physical and geographical characteristics of the area of the Country provide for intensive connection with neighbouring countries and regions and inclusion of our own capacities in international division of labor.

The established Vardar-Morava natural axis with developed major infrastructure of European significance is an important spatial and functional skeleton of the Country's development.

Through links enhancement of Central and Western European Countries with the countries of the Eastern Mediterranean and Near East, on the basis of favorable geographical and transportation position, Macedonia has the opportunity to use its spatial and functional position in a rational and efficient manner.

Transversely to Vardar corridor, which has undoubtedly important convergent importance, there are conditions for mobilization of links through the valley of Kriva Reka and the saddle of Deve Bair and the valley of Strumica River with the Republic of Bulgaria and Near East, and with the Republic of Albania through the valley of Radika River and the saddle of Kjafa San, and through Adriatic link Duras-Brindisi with Western Europe, and for establishment of east-west corridor of appropriate convergent meaning.

The development of the said corridors is propounded by the mediation and transit role of the Republic of Macedonia between Europe and Asia and enclosure of domestic economic facilities

into European integration processes, on one side, and intensification of internal inter-regional links and mobilization of factors of more balanced regional development, on the other.

Certain disadvantages related to geographical position include:

- the central Balkan position of the Republic of Macedonia prevents its direct access to sea, forcing it to use port services of Thessalonica and Duras through railway or road transport;

- the dominant role of Vardar corridor to date, and its mono-centric meaning, brought about concentration of population, economic and non-economic activities (Kumanovo, Skopje, Tetovo, Veles, Negotino, Kavadarci, Gevgelija) and deterioration of environmental quality;

- concentration of cultural, economic and political centres onto longitudinal axis, or on the crossings with transversal axes resulted in demographic resigning from border areas and their economic stagnation, thus reducing the possibility for their trans-border linkage with neighbouring regions and countries on the Balkans;

- exposure of geographical and transportation position at various impacts in war conditions as exceptionally negative factor.

The undoubted favorable geographical position of the Republic of Macedonia and its complexity may lead to greater spatial and functional integration with its neighborhood and wider, through well designed and systematic spatial planning.

The greater integration of the Republic of Macedonia into European and global transportation developments requires maximum utilization of its geographical position towards direct surrounding. The fact that one of the most important transportation corridors, connecting Scandinavian and Baltic regions, through the countries of Central Europe with the countries of the Near East,

i.e. South Africa, passes through the Country deserves particular respect.

One of the most important positions in the TEM (Trans-European Motorways) is held by the future highway North-South, road section E-75. The starting point of this road is in Helsinki, but the main road route begins in Gdansk (Poland) and ends up in extreme south in the Republic of Greece, from where, through waterways, the corridor proceeds towards Africa and Asia Minor. Within this corridor, at global level, the corridor of fast railways with designed speed of 160 km/h is included, as well as the waterway connecting Danube River with the Aegean Sea and telecommunication corridor North-South, which intersects with the appropriate Balkan corridor at Skopje.

Significant improvements in road transportation can be expected with the implementation of road corridors of the TEM (Trans-European Motorways) system which passes through the Republic of Macedonia or concerns it in terms of the close vicinity.

International roads passing through the Republic of Macedonia include: E75-Gdansk, Katowice, Bratislava, Budapest, Belgrade, Skopje, Athens, Cairo; E65-Malme, Swinousschie, Prague, Brno, Bratislava, Zagreb, Rieka, Dubrovnik, Podgorica, Pristina, Skopje, Tetovo, Ohrid, Bitola, Lamia, Kalamata, South Africa; E850-Brindisi (Italy), Duras, Ohrid (connected with E65); E871-Sofia (connected with E79, E80 and E83), Kumanovo (connected with E75).

International roads envisaged to pass through areas neighbouring to Macedonia include: E80-Roma, Pescara, Dubrovnik, Podgorica, Pristina, Nis, Sofia; E771-Bari, Bar, Skadar, Prizren, Pristina; E90-Palermo, Taranto, Igumenica, Thessalonica, Alexandroupoulos; E79-Sofia, Blagoevgrad, Thessalonica.

The central position of Macedonia on the Balkans enables passing of the most important telecommunication corridors

through it, such as Trans-Balkan telecommunication corridor east-west, and there are international and inter-continental air corridors over the Macedonian sky, with a possibility for further development. An important air corridor on east-west direction still lacks, and it would provide connection through Macedonia's air space of the Black Sea region with the Adriatic Sea.

II. SPACE ORGANIZATION, USE AND PROTECTION

1. SOCIO-ECONOMIC BASIS OF THE SPATIAL PLAN

Current status

In the past period, the socio-economic development of the Republic of Macedonia has been characterized with exceptional dynamism, but with misbalance of the development as well. Consequently, significant level of development has been achieved, affected by certain disproportions and collisions of individual segments of the development.

The achieved level of development of the Republic of Macedonia, its economic structure and spatial organization and the distribution of economy in the past period have been determined by different material and institutional conditions.

In the period before 1980, economic potential was created through modern technology transfer and constant qualitative changes of economic system, representing realistic basis for prosperous development of the overall economic and social life of Macedonia. In certain sectors and branches, the said economic potential has had and still has features of modern economy. In the process of economic development of the Country, the policy of development has been oriented mainly towards extensive, but also sustainable utilization of natural conditions, land and forests, ore resources, population and labour.

Due to the above, the structure of the economy had been characterized by continuous changes towards increased share and significance of industry, agriculture, construction industry, trade and transport. Later on, especially by the end of the 1970s, 1980s and 1990s, the focus of development was transferred towards more rapid development of secondary and tertiary activities,

especially towards the sector of services, commerce, catering and tourism, financial services, information and computer technology and PTT services.

After the independence of the country, systemic changes have been initiated in almost all spheres of economy. In the course of the first five years, or till 1995, economic development was characterized by negative rates. The first positive trends noted as of 1996 were slowed down by factual external and internal developments. War activities in the neighbourhood, economic embargo towards our northern neighbour, the embargo from neighbouring Greece, refugee crisis of Kosovo and especially crisis events in our country during 2001-2002 caused difficulties in economic developments. Such circumstances had strong impacts on all segments of the economy, especially on the scale of industrial production, lagging of investments, employment and affected achievement of projected macro-economic aggregates.

In such circumstances, the efforts of the Macedonian governmental policy are focused on the provision of stability of economic trends, revitalization of economic activities and strengthening of initiated integration processes.

The associative membership of the Republic of Macedonia in the European Union and membership in the World Trade Organization have created conditions for greater opening of Macedonian economy towards international global market, fostering of investments, strengthening of GDP and by all these – prosperity of the national economy.

Goals

-acquiring a stable, efficient and dynamic economic development, through qualitative structural changes in the overall

economy and establishment of better harmonized relations in reproduction;

- increasing the efficiency and cost-effectiveness of economic management and based thereon increasing of production and export through economic criteria and establishment of a process of revitalization and restructuring;

- more successful and more intensive inclusion of economy into international economic relations and international division of labour;

- acquiring more rapid technical and technological development, mainly through faster development of our own science and technology and rational utilization of scientific and technological achievements in the world;

- increase in employment, based mainly on economic criteria and stronger support to development by knowledge and skills of the labour;

- ongoing improvement of material, cultural, social and other conditions for working population and citizens living and work; continuous and increasing meeting of needs and strengthening of material and social security of the population, as basic and lasting commitment of the society;

- accomplishment of more balanced regional development, through faster development of economically underdeveloped areas;

- accomplishment of sustainable use, organization and development of the space in line with the needs for rational distribution of production resources;

- changing the attitude towards natural environment by means of systemic, material, educational and other support towards its preservation, protection and improvement.

Planning determinants

The time we live in may be rightfully called a period of historical changes. The basic notions of the end of the second millennium include: dramatic changes and globalization brought about by the industrial revolution enabled the man to govern the Earth and to go invade the space.

It is believed that the revolutionary change brought in by the new philosophy of quality is a transfer from relations of confrontation towards relations of cooperativeness in all types of activities.

The modern approach towards the establishment of our own goals should be based on cooperation and partnership with those that possess capabilities we lack in the search for common interests. Long-term partnership should be based on win-win strategy, which assumes exchange of capabilities, and not only unilateral request by one and assistance provision from the other side. One should be prepared and competent for this. It assumes highly creative, and not stereotype application of international standards and solutions in our practice and offering of our own knowledge to partners. This requires first-class personnel, who have not only talent, but also an opportunity to work on attractive projects and exchange experience at international level. To this end, proper climate for the management, work and affirmation should be created for the numerous young professionals in the Country, in order to prevent the drain of "brains" - the greatest assets of this country. This may be achieved through stronger support to our own development based on learning from others.

The world class of the product enables a company to enter the international market, maintain long-term competitiveness and acquire high profits, and brings prestige and image to the country.

New trends at highest level assume efforts aimed at establishing new manner of operation in our companies and administration, ensuring world class results. It requires new revolutionary break through towards new values in people's conscience, new climate, orientation towards changes and creative application of global knowledge and experiences into local circumstances.

The future development and distribution of economic activities on the area of the Republic of Macedonia are based on the goals of the economic development defined

in the “National Strategy for Economic Development” concerning its spatial distribution, determinants of rationale use of available potentials and development advantages and the concept of the system of settlements, as well as the policy of better balanced and more rationale spatial organization of economy.

According to the projected indicators, Macedonia should count on additional accumulation from abroad, earmarked exclusively at new investments, rather than towards import of goods for personal consumption, that could result in enhanced economic efficiency of investments and sustained development of the national economy.

Within such constellation of conditions and assumptions, by maintaining solid macro-economic environment and accelerated implementation of structural reforms, establishment of a basis for achievement of projected rates of annual GDP growth of 5.3% or 5.1% has been envisaged.¹

The level of economic structure development, the current development stage of the economy, the extent of factors availability, economic conditions and economic position of the Republic of Macedonia in the world determine the directions and the combinations of investments with other development factors aimed at ensured future development.

Reasonably, future development should focus on:

- export intended production (Macedonian economy should logically export around three quarters of its production), thus making the export, rather than domestic demand, to act as the main driving force of investment and economic development;

- technological modernization of facilities, to result in long term establishment

of technologically modern and better propulsive structure of capital funds capable of acquiring a high quality export product;

- investment projects with mainly labour intensive features due to huge availability of relatively low cost manpower, incorporating notions of young, well educated structure, ready to accept new technology;

- investment in economic infrastructure, technological modernization and construction of new infrastructural facilities, but with clearly recognized social and economic usefulness;

- investment in the network of local and regional infrastructure in line with demographic trends and the need for better balanced spatial development;

- investment in housing building with investing schedule dependent on the level of income, savings of the population, population growth and the trends of families splitting.

The initial assumption of spatial and regional development is that spatial and urban planning require more than awareness of the country development, but it also requires analysis and prediction of impacts from such development in terms of its spatial distribution. This should be based on realistic factors according to which distribution is carried out in two ways:

- spontaneously, by locating certain companies, enterprises, facilities, plants, according to the decisions of individual owners or managers;

- programme driven, by construction based on the projections and decisions made by public authorities or bodies of the local self-government.

The two methods together reflect the spatial organization of economy.

Through these two decision making methods, the spatial organization is achieved during time as dispersion in the space and as concentration of economy in individual places. However, there rules in such distribution that cannot be neglected in order to achieve the projected balance.

At present, when the economic system is dominated by market and private ownership,

¹ Development scenarios of average annual GDP increment proposed in the Study “Economic basis of the Spatial Plan of the Republic of Macedonia ”- Faculty of Economics -Skopje.

there are even less opportunities for setting balance as a firm objective. The real solution is combination of the concentration with the dispersion, as complementary approaches to development and spatial distribution of economy.

Through spontaneous distribution of economic facilities and through agglomeration of the population in the space, centres-poles of development are established, as well as axes of development as units connected in a kind of "line". The analysis has shown that even in such distribution there are certain rules applicable to spatial planning.

The development axes in the past were formed in relation to geographic characteristics of areas, i.e. in accordance with relief, rivercourses and alike. Today, business relations, inter-personal communications, geographical features, as well as developed infrastructural systems and economic facilities have gained higher importance.

Development axes draw the lines of infrastructure, especially transportation systems, which afterwards form the entire network through mutual interface.

The most important axis in the Republic of Macedonia is the one passing through the central part of the national territory. It follows the course of Vardar River, from Skopje southwards. Historically, it was established throughout the XX Century, and even earlier, and, crossing the border, it reached Thessalonica on south. After the First World War, it was extended towards north and joined the axis along the course of Morava River. Today, on the national territory, it links the cities: Kumanovo - Skopje - Veles - Negotino (and Kavadarci) - Demir Kapija - Valandovo - Gevgelia. On north of Skopje, there is a branch to Pristina as well. Whatever changes appear in future, this axis will remain the main one in the coming decades.

After the Second World War and till present, in the northern and western parts of the country, the axis that could be named

northern has been established, linking the following cities: Kriva Palanka - Kumanovo - Skopje - Tetovo - Gostivar - Kicevo - Ohrid - Struga. Through modern changes, this axis has been extended on east towards Kjustendil-Republic of Bulgaria and towards Elbasan-Republic of Albania on west.

In Macedonia, there is another axis that could be named southern, although it has rarely been mentioned as such so far. It links the following cities: Struga - Ohrid - Resen - Bitola - Prilep - Kavadarci - Negotino - Stip - Kocani-Delcevo and continues towards Blagoevgrad in the Republic of Bulgaria. On west, it continues towards Elbasan - Republic of Albania. There is no realistic probability that this axis becomes international, but it connects significant poles of development inside the country.

In the eastern part of the country, there is good probability to establish an eastern axis, to link the following cities: Kumanovo - Sveti Nikole - Stip - Radovis - Strumica. Presently, this zone is of low intensity, but the development will enhance its importance. Even now, there is a branch leading from Strumica to Petric in Bulgaria.

It is also rather probable to establish a western axis in the western part of the Republic of Macedonia, that would start in Debar and through Kicevo and Demir Hisar reach Bitola, and then to Florina and further. On west, it will continue towards Peskopea-Republic of Albania.

The Spatial Plan will take into account all above mentioned axes with regard to spatial organization, especially in the context of roads modernization, construction of long-distance power lines, gas pipelines, etc.

An important impetus in the national economy development and progress is provided by the possible forms of specific economic spatial innovations based on strategic goals that should be achieved through their promotion.

The main goals in the domain of specific economic entities (free economic zones) establishment include:

- identification of new institutional development forms to support the economic cycle revival;
- creation of preconditions for improved spatial balance of development;
- fostering direct investments in economy;
- enhancement of competitiveness of small and medium enterprises;
- observation of defined environmental standards.

The specific spatial entities (free zones) should support several tendencies: encouragement of integration links within Balkans and wider region; balanced development of urban skeleton through intensified development of other cities (other than Skopje); encouragement of the economic cycle revitalization and changes in economic structure. The achievement of such goals should be supported by instruments of the economic policy of the country.

For the purpose of establishing free economic zones (FEZ), locations have been projected in the regions of Skopje, Pelagonia, Gevgelia, Stip and Strumica. In the past, in the period between 1996 and 2003, two free economic zones were declared, namely: FEZ "Bunardzik" near Skopje and FEZ "FENI" near Kavadarci. At present, activities are in progress to provide documentation for declaration of two free economic zones: "Silmak"-Jegunovce and FEZ "Prdejci" near Gevgelia.

2. USE AND PROTECTION OF NATURAL RESOURCES

2.1. AGRICULTURAL LAND

Current status

The Republic of Macedonia has 1 244 000 ha agricultural land or 48.4% of its total territory. The ratio between arable land area (612 000 ha) and area under pastures (630 000 ha) is 49%:51%. This balance was relatively stable for rather long period, but the total agricultural land has been permanently decreasing during the last 30 years. The structure of arable land is dominated by ploughland and gardens

covering an area of 512 000 ha, or 84%. At European level, Macedonia belongs to the group of countries with medium availability of agricultural and arable land, or the average area of 0.30 ha arable land or 0.25 ha ploughland per inhabitant or 2.3 ha per agricultural inhabitant.

Areas under fallows and uncultivated ploughland amount to 140.000 ha or 23% of the total arable area. These areas have noted certain trend of decreasing since 1996. However, their share is still high. This has resulted from social and demographic transformations of rural population that abandoned hilly and mountainous areas where no mechanisation could be applied. The leading position in the structure of planted arable land areas (348.000ha in 2001) belongs to grains covering 220.000 ha (63%), including mainly wheat - 117.000 ha (53% of the areas under grains), with annual production of 246.000 tons, or 2.132 kg/ha. Industrial crops occupy 6% of the area under ploughland and gardens (at global level, such areas range between 15-17% of planted areas), led by tobacco cultivated on 20.310 ha (annual production of 23.217 tons). Next are areas under sunflower (6.000 ha), sugar beet (2.000 ha) and poppy. Fibrous crops (cotton, lin, hemp) are not represented.

Vegetables cover 56.000 ha, or 16% of planted arable land with rather rich assortment of products in line with agro-ecological conditions, enabling rationale utilization of natural resources and yield of marketable surplus.

Vineyards occupy 28.000 ha, out of which 90% are grown by intensive systems application.

Fruit growing is represented only on 2.7% (16.600 ha) of arable land, with total of 8 million fruit trees.

Livestock development has noted negative trends during the past decades. Main reasons for this include: non-synchronized development of livestock with climate and soil conditions, and in certain areas with farming production, over-size of certain processing facilities (dairies and

slaughterhouses) and lack of other facilities (poultry slaughterhouses, eggs processing facilities), hindered conditions of reproduction materials and raw materials for fodder (domestic production supplies 55% of the demand for fodder), insufficient development of science, in terms of its capability to create new technological solutions under current conditions, etc.

On the territory of the Republic of Macedonia, there are 106 irrigational systems, which may irrigate, with their principal facilities, in an average dry year, 126.617 ha agricultural land area. In the course of the last several years, the irrigated area has ranged between 50 and 60.000 ha, i.e. the capacity of built systems provides irrigation for 21% of arable land area, and only 9% of it is practically irrigated. The structure of irrigated areas (51.617 ha in 1996) shows that the share of ploughland areas is 77%, orchards - 8%, vineyards 13% and meadows 2%.

Goals

- synchronization of the scale and mode of agricultural land use with natural conditions and constraints, and land use change from agricultural into forest lands, i.e. forestation and grass planting on parts of arable land areas of low cadastre class;
- prevention of existing trends of over-rated and uncontrolled land use change of fertile areas into unproductive purposes, especially in urban areas;
- enhancement of productive ability of agricultural land and improved output structure of arable areas for the purpose of higher food production;
- temporary or lasting elimination from the process of food production of areas where concentrations of toxic matters in soil, air and water exceed permissible levels;
- reclamation of degraded areas into land for agricultural purposes, through application of reclamation and agro-technical measures;
- establishment of conditions for continuous improvement of economic efficiency of agricultural sector;

- utilization of relative advantages and favorable conditions of certain areas and properties for higher level of finalized output and responding to demands of processing facilities and their orientation towards export;
- provision of capital and other conditions for formulation and implementation of the programme for regionalization of agricultural production for the purpose of sustainable utilization of all natural resources, human resources and industrial production facilities.

Planning determinants

Preservation, protection and rationale use of agricultural land is the basic planning determinant and main precondition for efficient exercise of production and other functions in agriculture. Conflicting situations that may arise from the development of other economic and social activities will be addressed on the basis of criteria for overall social and economic sustainability and justifiability. In the domains of agricultural land protection and use, the Plan gives absolute priority to the prevention of degradation of the soil layer and improvement of its productive properties, increase of arable areas to extend to terrains where proper conditions exist, as well as maximum possible intensification of agricultural production in order to contribute to the strategic goals of the sustainable development and prosperity of overall economy in the Republic of Macedonia by 2020.

The projected future use of agricultural land and changes compared to current status can be presented as follows:

- decrease of the total agricultural area by 4%;
- decrease of ploughland and gardens covered areas by 14%;
- increase of fruit growing areas by 76%;
- increase of areas of vineyards by 30%;
- increase of areas under industrial crops by 126%;
- increase of areas under vegetables by 25% ;

- increase of areas under forage crops by 67%;
- decrease of fallow areas and uncultivated ploughland by 70%.

Taking into account the criteria for agricultural land use, the expected possibilities for capital investments in primary production (perennial crops and livestock sector development), as well as the trend of the past development, it has been estimated that the changes proposed to take place by 2020 will result in optimal use of agricultural land.

In order to acquire optimal utilization of environmental and other conditions, regionalization has been proposed, according to which the Republic of Macedonia has been divided into six agricultural commercial regions and 54 micro-regions, namely: I- Mediterranean, or Vardar Area, sub-divided into South Mediterranean with two micro-regions and Central Mediterranean with 10

micro-regions; II- Pelagonia with 10 micro-regions; III-Skopje-Kumanovo with 14 micro-regions; IV- Western region with 7 micro-regions; V- Eastern region with 8 micro-regions; VI- Large lake region with 3 micro-regions.

Agricultural and arable land

The structure of agricultural area is composed of arable land areas, pastures and minor areas under reeds and marshes.

The ratio between arable land area and the rest (pastures and reeds and marshes) within the general structure of agricultural land area will remain unfavorable in future, as well. This is due to the high share of pastures, the transformation of which will not increase arable land areas. Taking into account the scale of abandoned fields, transformation of around 7.000 ha pastures can be realistically expected.

Areas of agricultural land by categories of use in 2020 by regions - 000 ha

Table 1

Region	Agricultural area	Arable area					Pastures
		Total	Ploughland and gardens	Orchards	Vineyards	Meadows	
<i>Total in the Republic of Macedonia</i>	119	5	44	30	40	60	62
	5*	70	0				5
Mediterranean	329	197	150	7.8	28.8	10.4	199
Pelagonia	254	130	106	2.8	2.6	18.6	124
Skopje – Kumanovo	157	88	70	3.7	6.0	7.3	69
Western	178	53	41	4.2	0.4	7.4	125
Eastern	140	68	51	5.0	0.4	11.6	72
Large lake region	70	34	22	6.5	1.8	3.7	36

*1.000 ha under marshes and reeds

The share of arable land area in the current structure of agricultural land is 49.2%, and the same share in 2020 will be 47.7%, or arable land will decrease by 42.000 ha. Arable areas are mostly cultivated land areas (ploughlands) and gardens in all regions and the same proportion will be retained in future. However, highly intensive systems of vegetable and industrial crops, forage crops to support intensive livestock

breeding will be developed within the system of ploughlands and gardens, but intensive systems of fruit growing and viticulture have been estimated as the most cost-effective ones. These efforts are expected to result in decreased share of ploughland areas and gardens in the overall arable area, and increased share of perennial crops, not only at the level of the Republic of Macedonia, but in all agricultural commercial regions.

Structure of arable areas use by regions (total arable area =100) in 2020

Table 2

Region	Ploughland and gardens	Orchards	Vineyards	Pastures
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Mediterranean	76.1	4.0	14.6	5.3
Pelagonia	81.5	2.2	2.0	14.3
Skopje – Kumanovo	79.6	4.3	6.8	8.3
Western	77.4	7.9	0.8	14.0
Eastern	75.0	7.4	0.6	17.0
Large lake region	64.7	19.1	5.3	10.9
<i>Total in the Republic of Macedonia</i>	<i>77.2</i>	<i>5.3</i>	<i>7.0</i>	<i>10.5</i>

In total, the share of ploughland areas and gardens in the Republic of Macedonia decreases by around 14%, and around 72.000 ha in absolute terms. The share of fruit crops will note relative increase in all regions. The share of vineyards will remain highest in the Mediterranean region, where it increases from 8.3% to 14.6%. Observed only through the share of areas under perennial crops in the arable land areas, the intensity will increase from 7.4% to 12.3%.

Use of ploughlands and gardens

Current use of ploughlands and gardens is characterized by insufficiently intensive systems, assessed by the share of crops

groups (grains, industrial crops, vegetables and forage crops) on one side, and by enormously high share of fallows and uncultivated land areas, on the other.

It has been considered that the agriculture in general will experience significant growth in the coming period, owing not only to the overall development, but also to the change of the system, through stimulation of private initiatives, as well as through expected incentives in agriculture in general, which will result in significant interest that will enable achievement of optimal utilization of natural resources.

Areas of ploughland and gardens by categories of use in 2020 by regions - 000 ha

Table 3

Region	Ploughland and gardens	Grains	Industrial crops	Vegetables	Forage crops	Fallows and uncultivated ploughlands
Total in the Republic of Macedonia	440	190	70.0	70	60	50.0
Mediterranean	150	60	27.0	25	20	10.0
Pelagonia	106	48	31.0	10	10	7.0
Skopje – Kumanovo	70	28	10.0	20	10	2.0
Western	41	18	1.0	8	10	4.0
Eastern	51	18	0.5	4	5	23.5
Large lake area	22	10	0.5	3	5	3.5

It may be expected that the economic interest and the market will contribute to the proper distribution of production, using the most favorable conditions (areas) where highest effects will be achieved. One of the basic goals is to incorporate current fallows and unplanted ploughlands and gardens in the future structure of land use. It has been estimated that these areas will decrease by half in the coming period (from 164.000 to 50.000 ha), through the following interventions: first, fostering of agricultural activities and agro-businesses through macro-economic policy, under which fallows

will no longer be used as agro-technical measures; second, accurate registration of these areas by municipality, with the support of the competent (state) bodies and other expert institutions should be carried out, in order to identify areas that are unfavorable for agricultural production, while for the purpose of activating favorable areas, appropriate programme should be developed and incentive measures proposed. In addition to this, intensification of ploughland areas and gardens utilization is accompanied with relatively high increase in the share of vegetable, industrial and forage crops,

increased share of corn in grains, and introduction of second crops on an area of 38.000 ha.

Fruit growing

There are relatively favorable soil and climate conditions in the Republic of Macedonia for more intensive development of fruit growing than the current one. Both continental (pear, plum, peach, apricot, etc.) and subtropical crops (privet, fig) can be

grown successfully. Continental fruit species will remain most represented and will be grown, more or less, in all regions and municipalities. In series of years, certain species have found their natural ways towards certain regions where they will remain dominant (apple – most present in the areas of Resen, Ohrid and Tetovo), peach in Tikves and Gevgelia areas, apricot in Skopje and Veles areas, etc.).

Planting of new areas with fruit trees, by 2020, by regions - in ha

Table 4

Regions	Mediterranean	Pelagonia	Skopje Kumanovo	Western	Eastern	Large lake	Total:
Apple	80	30	20	340	70	900	1.440
Pear	470	150	150	170	70	200	1.210
Plum	170	180	80	260	340	100	1.130
Sweet cherry	52	5	15	20	/	20	112
Sour cherry	355	240	350	200	430	110	1.685
Apricot	1.050	/	450	/	/	10	1.510
Peach	930	50	300	10	/	30	1.320
Walnut	90	10	60	120	45	70	395
Almond	400	/	100	/	/	/	500
Strawberry	180	105	130	80	/	25	520
Raspberry	20	50	60	10	/	15	155
Total:	3.797	820	1.715	1.210	955	1.480	9.977

In all regions, there is a need to construct deep freezing facilities for fruit and vegetables, and where those exist, their capacity needs to be enlarged and modernized, as major parts of fruits will be processed in future, and the same facilities should provide for semifinished articles storage, too.

Viticulture

According to the projections, areas under grapevine crops will increase from 28.000 ha in 2001 to 40.000 ha in 2020. In order to

supply the existing facilities and utilize the favorable environmental conditions, areas under grapevine crops will be increased in the areas of Kumanovo, Bitola, Ohrid, Skopje, Veles, Strumica, Radovis, Sveti Nikole and Stip.

The analysis of projections of future facilities in viticulture reveals similar relations as the current ones. Leading producers will be the Municipalities of Kavadarci and Negotino, and viniculture is planned as activity in 28 municipalities.

Areas under viniculture in 2020 by regions

Table 5

Regions	Area in ha	Share in %
	Mediterranean	28.700
Pelagonia	2.600	6.5
Skopje – Kumanovo	6.100	15.3
Western	390	1.0
Eastern	410	1.0
Large lake region	1.800	4.5
Total:	40.000	100.0

More than 70% of the new areas have been planned in the Mediterranean region, where significant increase of close to 10.000 ha has been projected.

The winegrowing is usually grouped (divided) into so called vineyard areas. In Macedonia, 16 vineyard areas have been recognized, according to the type and quality of grapes, as well as natural conditions. The structure of grapevine crops, according to the projections, will be composed of wine sorts with a share of 32.000 ha (80%), and the share of table sorts will be 8.000 ha (20%). Table sorts are concentrated in the vineyard areas of Tikves, Gevgelia-Valandovo, Veles and Strumica-Radovis. Wine sorts, apart from Tikves vineyard area, are grown in significant quantities in Tikves vineyard area, as well as in the areas of Kumanovo, Skopje, Veles, Gevgelia-Valandovo, Strumica-Radovis, Ovce Pole, Bitola and Ohrid. The total quantity of grapes production will amount to 366.000 tons with an average yield of 10.1 t/ha.

The existing freezing facilities in Kavadarci, Negotino, Valandovo, Gevgelia, Bogdanci, Veles, Strumica, Radovi, Bitola and Kumanovo have total capacity of 30.860 t for table grapes keeping. Their technical cooling ability is sufficient for the whole quantity of table grapes intended for export, and therefore no new facilities are planned for the projected quantities of production.

At present, the 15 wine cellars have storage capacity of 2.280.000 hl wine. They are equipped with primary processing equipment, by which the entire quantity of produced wine grapes is processed in a timely manner. By 2020, additional five wine cellars are envisaged to be constructed (Negotino-1, Kavadarci-2, Gevgelia-1, Bogdanci-1), with a total capacity of 170.000 hl. At the same time, extension of storage capacity is planned in four wine cellars for 100.000 hl. In 2020, there will be 20 wine cellars with total capacity of 2.550.000 hl.

In the Republic of Macedonia, organization of so called biological (ecological) agricultural production has been

envisaged, with priority being given to two climate and soil zones – hot continental climate zone spreading in the range between 600 and 900 m above the sea level and partially cold continental climate area spreading between 900 and 1200 m above the sea level. Specific areas within the said climate zones where biological production could be organized sooner, include: Mariovo, Porecie, Pijanec and Males, Slaviste and Kicevo areas. The development of biological (ecological) agriculture, similar to the one practiced in European countries and USA, requires prior adoption of legislation (decree) on biological food production.

Livestock and fishery development

Livestock development will be oriented towards increase of cattle stock and its breed composition. Minimal increase (1.8%) is envisaged with cattle breeding, through increased number of cattle heads and substitution of low production with thoroughbred cattle, especially in plane areas. The total number of cattle heads will reach around 300.000. Number of sheep is envisaged to increase by 43% or from the current 1.800.000 to 2.600.000 heads in 2020. The semi-nomadic sheep breeding will be retained due to increased interest in lamb export.

Due to the low utilization rate of pig raising farms and genetic resources, pigs stock increase by 82% and establishment of reproduction centre for high quality breeding heads are envisaged. The total number of pigs will reach 350.000 heads.

Certain increase has also been envisaged in the poultry development, including the number of egg-laying hens - by 26% and introduction of broiler production at the level of 10 million broilers per year. Precondition for the development of broilers production is the construction of poultry slaughterhouse in Mediterranean region and eggs processing facilities in Mediterranean or Pelagonia region.

Increase of bee families by around 60% is also envisaged in all regions.

Fish breeding areas in the Republic of Macedonia will also note increase in all categories. The highest absolute growth is projected with accumulation lakes, the total

area of which will increase from the current 5.759,7 ha to 8.259,7 ha, or for 2.500 ha new areas.

Water areas for fish breeding in 2020

Table 6

Region	Projection by 2020			
	Natural lakes- ha	Man-made accumulations - ha	Fish ponds for	
			Carp-ha	Trout- m ²
Macedonia	43.480	8.259.7	940.3	40.000
Agricultural commercial regions				
Mediterranean	2.800	4.026.7	240.1	7.100
Pelagonia		649.0	450.0	2.800
Skopje – Kumanovo		839.0	150.0	8.500
Western		2.537.0	/	12.300
Eastern		153.0	0.2	6.000
Large lake region	40.680	55.0	100.0	3.300

According to the projection, the total fish production in the Republic of Macedonia will increase by 2020, from the current 989 to 2.300 tons (index 233). The main mass in this increment will be trout fish species (1.435 tons, or 62%), originating mainly from fish ponds. The fish catch from natural lakes, as well as from areas used for this purpose, will not change by 2020, i.e. it will remain at the current level.

Areas for irrigation and drainage

The effect of irrigation of arable land areas in our climate conditions is very high. Depending on the crop and climate conditions, the yield may increase by 3 to 5 times. The deficit of water, depending on the crop, amounts between 20 and 80% of the total consumption. This percentage is especially high with spring crops. Irrigation is a vital precondition for early vegetables,

Areas planned for irrigation by 2020 by basins

Table 7

Basins	Areas eligible for irrigation - ha	
	Suitable for irrigation	Irrigated by 2020
<i>I Vardar River Basin</i>	318536	223.740
1. Polog	28640	27.714
2. Skopsko Pole	21593	21.593
3. Kicevo - M. Brod	7870	2.785
4. Peinija - Kumanovo and Kriva Palanka	27742	15.762
5. Middle Vardar River (Veles - Demir Kapija)	19593	11.769
6. Upper Bregalnica	11176	9.936
7. Middle and Lower Bregalnica	49069	34.123

8. Pelagonia	109966	62.020
9. Lower Crna Reka – Tikves area	25870	21.615
10. Lower Vardar - Valandovo and Gevgelia	16422	15828
11. Doiran	595	595
<i>II Crn Drim River Basin</i>	25070	16.695
1. Prespa	8320	5.835
2. Ohrid-Struga area	15260	9.370
3. Debar area	1490	1.490
<i>III Strumica River Basin</i>	27244	26.732
1. Strumica – Strumica area and Radovis area	27244	26.732
<i>Total I + II + III</i>	370850	267.167

The total planned areas for irrigation by 2020 amount 267.167 ha. By regions, the largest areas planned for irrigation are in the I region (32.4%), and the least in V region (5.6%) and VI (5.7%). Aftercrops will cover largest areas in I region (40%), II (25%) and III (15%).

Areas for irrigation will increase by 3.500 ha, as follows: Polog 300 ha, Kicevo area 600 ha, Pcinja 900 ha, Veles 300 ha, Lower Vardar 800 ha and Struga Fields 600 ha or total, together with the current ones, 85.695 ha. One of the major tasks in the coming period is the maintenance of constructed drainage systems.

2.2. FORESTS AND FOREST LAND

Current status

The total area under forest, forest crops and intensive crops in the Republic of Macedonia (2001) amounts 997 374 ha (source: State Statistical Office) or 38.8% of the total territory or 0.49 ha/inhabitant. This forest coverage (29.3%) is not much lower compared to European averages, nor with neighbouring countries (Republic of Serbia 26.2%, Republic of Bulgaria 28.7% and Republic of Greece 16.0%). However, if we take into account the fact that 71% of the areas are low-trunk and degraded forests, within which only 37% of wood pulp reserves are concentrated, than it gets clear that the country, with 82.1 m³/ha, is poor in high quality forests and lags behind European countries (Switzerland - 257 m³/ha, Austria - 162 m³/ha, Germany - 126 m³/ha, Slovenia - 186 m³/ha). There are huge regional differences in forest coverage, ranging between 10.5% in Sveti Nikole,

14.4% in Prilep, 19.6% in Kumanovo, 20.3% in Probistip to 56.6% in Radovis, 57.4% in Brod and 62.2% in Valandovo, or the lowest forest coverage exists in the central parts of the country. Western part of the country has better quality wood stock (former Municipalities - Gostivar, Kicevo, Bitola), and in the eastern part - Berovo, Kocani, Vinica and Kriva Palanka. Large bare and unplanted forest land areas outside forests (217.749 ha), out of which, according to the estimates, around 129.000 ha are suitable for forestation, are present. Bare land areas are most present in former Municipalities of Stip 21.1%, Kocani 16.8%, Bitola 14.9%, Kriva Palanka 14.5% (of the total area), etc.

According to the data contained in forest management master plans, the total area of developed forests and forest land areas amounts to 998.054 ha (92% of the total forest land areas), out of which 855.670 ha or 85.7% are covered with growth, and 142.384 ha or 14.3% are forest land areas not covered with growth. Around 8% of forest areas have not been developed characterized with low productivity, mainly in private ownership. Out of the areas with growth, 240.255 ha, or 28.1% are covered by high-trunk forests, 581.652 ha, or 68.0% are covered by low-trunk forests and 33. 763 ha, or 3.9% are under forest crops (of an age up to 20 years).

Developed forests have a total wood volume of around 87 million m³ or 101 m³/ha, out of which: high-trunk forests dispose of 52 million m³ or 215 m³/ha, low-trunk forests 34 million m³ or 58 m³/ha and forest crops 11 million m³ or 34 m³/ha.

The total annual potential timber harvest amounts around 1.486.000 m³ gross wood

volume or 75% of the total annual increment (1.970.000 m³). However, due to factual and personal reasons, the total annual timber harvested in all forests in the country (for 1996) amounts 1.118.000 m³, or 56.8% of the annual increment. In 2001, timber harvest in the forests decreased, amounting 792.000 m³.

The structure of the volume of the annual utilization of wood products (1.118.000 m³) is dominated by fuel wood, with a total quantity utilized amounting to 844.000 m³ or 75.5%, followed by commercial wood for processing in lumber industry with 166.000 m³ or 14.8%. Residues at wood cutting reach 108.000 m³ or 9.7% of the total gross cut wood volume.

Accessibility of forests and quality of forest roads are unsatisfactory. Average road coverage is 6.53 km/1000 ha, or 6.228 km forest roads in total, which compared to the optimal coverage of 15 km forest road/1.000 ha is more than modest, and the share of soft roads is 84%.

Forests are hunting areas and habitats of 48 species of big and small game, 15 species of which are animals and 33 birds. There are six fenced game reproduction sites in the country, covering a total area of 4.651 ha.

Above the upper boundary of the forest vegetation, high mountainous pastures are positioned. Due to the sharp climate conditions, these pastures are used for 120 to 140 days of the year. High mountainous pastures spread over at altitudes from 1.000 to 2.764 meters above the sea level and cover an area of 192.486 ha. Out of these, 77%, or 148.529 ha spread over high mountains in western part of Macedonia. Most of the areas under these pastures are situated on the following mountains: Sara - 39.396 ha, Jakupica - 19.107 ha, Bistra - 17.102 ha, Osogovo - 14.489 ha, Baba - 11.500 ha, Galicica - 10.023 ha and Suva Gora - 10.954 ha.

Goals

– increase of areas under forest in line with the general regionalization and categorization of the space and improvement of forest quality through improved species

structure and substitution of low-trunk with high-trunk woods, remedy of degraded forests and underbush and their transformation into more productive forests;

– undertaking of growing measures in all development phases, especially in young forests development, as well as carrying out wood cutting for regeneration purposes, through introduction (direct conversion) into severely degraded forest plantations;

– forestation of terrains where land division/assessment has been completed, into terrains with highest effects (increased increment, improved environment, tourist and recreation purposes, etc.) and terrains of other economic justification and urgency (water regime regulation, erosive areas, protection of settlements, roads, utility and other facilities, hygiene and other functions, etc.);

– introduction of modern techniques and technologies in wood products utilization and more cost-effective exploitation of wood volume through increased share of commercial wood to the detriment of fuel wood and residues generated through wood cutting and development of forest wood variety assortments;

– increasing of forests accessibility through forest communications, improvement of forest roads quality and improvement of conditions for other forest products management;

– protection of forests through introduction of species that are resistant to diseases and pests, application of appropriate growing measures, regular control, erection of pirophyte plants belts, positioning and maintenance of cutting areas, continuous monitoring, undertaking of protection measures, etc.

Planning determinants

The projection of forestation for the coming period has been based on the existing natural conditions, above all climate, geological and pedological ones, current status of forests and forest land, erosion threatened land, pollution of air and state of

the living and working environment, as well as on the economic state of the country.

By 2010, total of 79.220 ha bare land areas will be afforested, including 41.300 ha within forest and 39.920 ha outside forest. In the period between 2011 and 2020, a total of 70.780 ha will be afforested, out of which 30.500 ha in forest and 40.280 ha outside forest areas. The annual forestation intensity will be 6.522 ha, so that the average annual

forestation in forest will amount 3.122 ha, and outside forest 3.400 ha, or forestation in forest will amount 47.9%, while forestation outside forest will equal 52.1%. So far, more than 92% of the total afforested areas have been planted with coniferous tree species, and only 7.2% with deciduous tree species. Projections propose forestation of 57% coniferous tree species and 43% deciduous tree species.

Afforestation in and outside forest areas in ha by regions

Table 8

Regions (former municipalities)	By 2010	By 2020	Total	Annual average
1. Berovo	1900	1500	3400	148
2. Bitola	4500	3900	8400	365
3. Brod	1100	1000	2100	91
4. Valandovo	500	400	900	39
5. Veles	5900	5600	11500	500
6. Vinica	2000	2100	4100	178
7. Gevgelia	1500	1200	2700	117
8. Gostivar	1000	1500	2500	109
9. Debar	1000	900	1900	83
10. Delcevo	3200	2000	5200	226
11. Demir Hisar	1300	800	2100	91
12. Kavadarci	3800	2500	6300	274
13. Kicevo	1320	3000	4320	188
14. Kocani	3800	2500	6300	274
15. Kratovo	1600	1400	3000	130
16. Kriva Palanka	1800	1500	3300	143
17. Krusevo	1100	1800	2900	126
18. Kumanovo	3500	2000	5500	239
19. Negotino	3200	3000	6200	270
20. Ohrid	1750	1500	3250	141
21. Prilep	8000	5700	13700	596
22. Probistip	1500	1700	3200	139
23. Radovis	2400	2300	4700	204
24. Resen	1600	1600	3200	139
25. Sveti Nikole	3100	3000	6100	265
26. Skopje	5950	6500	12450	541
27. Struga	500	500	1000	43
28. Strumica	2900	2500	5400	235
29. Tetovo	2200	1800	4000	174
30. Stip	5300	5080	10380	451
Total:	79220	70780	150000	6522

In the coming period, remedial of degraded forests and underbushes will be carried out, in order to improve the quality and maximize the utilization of natural production possibilities. Remedial will be

performed through direct conversion in severely degraded forests and underbushes, and application of indirect conversion method in better preserved low-trunk plantations.

Manner of forest improvement by 2020

Table 9

Manner of forest improvement	Total in ha	2010 in ha	2020 in ha
1. Sustainable development	646.000	286.000	320.000
2. Forest stock improvement	260.000	130.000	130.000
- Direct conversion	100.000	40.000	60.000

- Indirect conversion	160.000	70.000	90.000
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The proposed growing interventions will result in significant change of the status of forests, with positive quality changed structure. One of the most important measures that will contribute to notable improvement of the forest stock is the direct conversion. This measure will be carried out through introduction of profitable wood species. In the range of the oak spread, Scots pine, fir and other appropriate tree species will be introduced. From among deciduous tree species, several oak species and maple will be introduced. In the beech range, introduction will include fir, Scots pine, and molika (five leaf pine tree). In lower areas of the oak belt, black pine and cypress from among coniferous species may be introduced and several oak species from among deciduous tree species.

The application of planned growing interventions will contribute significantly to the improvement of forests quality structure. Thus, in 2010 the area under high-trunk trees will increase through forestation, as well as through direct and indirect conversion, from the current 29%, at 40.5%, wood reserve therein from the current 178.7 m³/ha at 191.76 m³/ha, and the increment from the current 3.45 m³/ha at 4.24 m³/ha. The representation of low-trunk and low production forests will decrease from the current 61.6% to 51.7%. Other forests category, like underbush, wild teasel and maquis, will also decrease from the current 9.4% to 7.8%. Wood stock in low-trunk forests will increase to 48.5 m³/ha, and the increment to 1.72 m³/ha.

Projection of forests by growing form in 2010

Table 10

	Area		Wood volume		Increment	
	Ha	%	m ³	m ³ /ha	m ³	m ³ /ha
High-trunk	395.000	40.5	75.744.540	191.76	1.676.300	4.24
Low-trunk	505.000	51.7	24.411.500	48.40	869.700	1.72
Other	76.440	7.8	768.960	10.06	35.400	0.46
Total:	976.440	100	100.925.000		2.581.400	

The projection for 2020 will result in improved status of forests in terms of growing form. The share of high-trunk plantations will reach 465.000 ha, or 44.7%, and the share of low-trunk plantations will drop to 449.000 ha, or 48.0%. The category of other forests will also decrease and amount 75.560 ha, or 7.3%.

In 2020, the high-trunk wood stock will amount 196 m³/ha at an average and the increment will be 4.75 m³/ha. In low-trunk

forests, wood stock will increase to reach 49 m³/ha, and increment of 1.95 m³/ha. Certain increase is also planned with other forest categories, through wood stock increase to 10.2 m³/ha, and increment increase to 0.51 m³/ha per year.

Significant improvements are expected to result from all projections aimed at forests improvement and forest land utilization, status of the area, quality, wood volume and increment.

Projection of forests by growing forms in 2020

Table 11

	Area		Wood volume		Increment	
	Ha	%	m ³	m ³ /ha	m ³	m ³ /ha
High-trunk	465.000	44.7	91.279.000	196.3	2.076.160	4.75
Low-trunk	499.000	48.0	24.451.000	49.0	973.600	1.95
Other	75.560	7.3	770.000	10.2	38.540	0.51
Total:	1.039.560	100.0	116.500.000		3.088.300	

Projection of forests by growing forms in 2020 by regions

Table 12

No.	Region (former municipalities)	Area ha	Wood volume		Increment	
			000 m ³	m ³ /ha	000 m ³	m ³ /ha
1	Berovo	42.300	9.400	222.2	215	5.08
2	Bitola	49.400	6.800	137.7	320	6.48
3	Brod	57.600	5.700	99.0	125	2.17
4	Valandovo	24.800	980	39.5	41,5	1.67
5	Veles	51.600	4.120	79.8	122	2.36
6	Vinica	24.800	4.800	193.5	78	3.15
7	Gevgelia	48.900	6.400	130.9	160	3.27
8	Gostivar	55.300	6.800	123.0	265	4.79
9	Debar	13.200	750	56.8	17,4	1.32
10	Delcevo	32.860	2.100	63.9	75	2.28
11	Demir Hisar	27.800	2.950	106.1	71	2.55
12	Kavadarci	50.100	5.860	117.0	122	2.44
13	Kicevo	51.400	6.800	132.3	175	3.40
14	Kocani	24.100	3.920	162.7	78	3.24
15	Kratovo	12.300	1.020	82.9	25,5	2.07
16	Kriva Palanka	27.100	5.100	188.2	77	2.84
17	Krusevo	12.400	1.010	81.5	24	1.94
18	Kumanovo	29.100	1.510	51.9	63	2.16
19	Negotino	29.800	1.810	60.7	40	1.34
20	Ohrid	49.100	5.320	108.4	135	2.75
21	Prilep	24.300	2.810	115.6	56	2.30
22	Probistip	9.600	1.005	104.7	18,9	1.97
23	Radovis	45.600	4.810	105.5	126	2.76
24	Resen	25.800	4.860	188.4	98	3.80
25	Sveti Nikole	10.200	485	47.5	85	8.33
26	Skopje	75.100	5.500	73.2	130	1.73
27	Struga	25.300	3.800	150.2	59	2.33
28	Strumica	50.900	5.700	112.0	150	2.95
29	Tetovo	40.200	3.400	84.6	101	2.51
30	Stip	18.600	980	52.7	35	1.88
	Total	1.039.560	116.500	112.1	3088.3	2.97

In 2010, the total area under forest will be 976.440 ha, wood volume 100.925.000 m³ and annual increment 2.581.400 m³. In 2020, the total area under forest will increase at 1.039.560 ha, wood volume at 116.500.000 m³ and total annual increment will reach 3.088.300 m³.

The total annual increment of forests in the Republic of Macedonia in 1996 was 1.969.721 m³, and thus the volume of forest utilization (timber suitable for harvest) should be projected within these values, i.e. the utilization rate to be lower than the value of increment. The current planned timber harvesting in forests equals 1.486.000 m³/year and its utilization equals 83.6% of the planned or around 1.242.200 m³/year, out of which 124.200 m³ are residues in cutting,

and the total of produced forest wood assortments amount 1.118.428 m³/year.

It is feasible to expect that full utilization of the planned timber harvesting of 1.486.000 m³/year will be achieved by 2020, yielding a production of around 1.319.000 m³/year forest wood assortments and around 147.000 m³/year cutting residue. The timber harvested from growing interventions (thin out) should be added to the above forest utilization, expected to reach 184.000 m³/year by 2020, out of which 156.000 m³/year will be the resulting forest wood assortments and 28.000 m³/year cutting residue.

Accordingly, the total annual timber harvested in all forests in the Republic of Macedonia, as projected for utilization by 2020, will amount 1.650.000 m³/year, out of

which 1.475.000 m³/year will be wood forest assortments, while 175.000 m³/year will be forest wood assortments.

Projection of the total volume of forest wood assortments (products) utilization by forest wood assortment type in 000 m³/year

Table 13

Type of product	Deciduous tree species		Coniferous tree species				Total	
			Natural forests		Man planted forests (forest plantations)			
	2010	2020	2010	2020	2010	2020	2010	2020
Forest assortment	1.108	1.161	97	158	68	156	1.273	1.475
Residue	123	129	11	18	12	28	146	175
Total	1.231	1.290	108	176	80	184	1.419	1.650

Projection of the total volume of forest wood assortments (products) utilization by forest wood assortment type in 000 m³/year

Table 14

	Sawlogs		Veneering and peeler logs		Other timber		Total timber			Fuel wood	Total
	dec.	conif.	dec.	conif.	dec.	conif.	dec.	conif.	Σ		
Projection by 2010											
m ³	194	105	4	2	11	2	209	109	318	955	1.273
%	15,23	8,25	0,32	0,16	0,96	0,16	16,48	8,56	24,98	75,02	100,00
Projection by 2020											
m ³	215	275	5	4	11	5	231	284	515	960	1.475
%	14,58	18,64	0,34	0,27	0,75	0,34	15,66	19,25	34,92	65,08	100,00

According to the above data on the projection, the volume of wood products utilization by 2010 will reach 1.273.000 m³/year. The ratio between timber and fuel wood is projected at 25:75, or the average share of timber will grow compared to fuel wood. In absolute values, fuel wood production will reach 955.000 m³/year, representing an increase of 111.000 m³, or 13.1% compared to 1996. Projected volume of timber production amounts to 318.000 m³/year, which is an increase of 112.000 m³, or 54.37% compared to the status in 1996.

The projection by 2020 will result in 1.475.000 m³/year production, and the ratio between timber and fuel wood will increase in favour of timber (35: 65). To that end, the following will be completed:

- reconstruction and modernization of the production of: sawed timber, cut veneer, plywood, peeled veneer for seats, peeled veneer for packaging material, raw plywood sheets, briquettes;

- construction of new facilities for: peeled veneer, to be used in combined waterproof sheets (Kavadarci and Kicevo),

cellulose processed by sulfite procedure (Kicevo), briquette production (Kavadarci, Miravci, Prilep and Skopje).

Projections of spatial distribution of briquette production facilities are based, before all, on the feeding areas, i.e. areas of residues generation. Manufactured briquettes will be based on residues generated from wood cutting - 168.600 m³, residues generated from wood processing - 238.200 m³, or 143.000 tons and residues generated in agriculture 310.000 tons.

Based on the above residues quantity, apart from existing facilities, construction of new briquettes production facilities has been envisaged by 2020, based on the raw material generated from:

- residues generated from wood processing in Skopje, Brod, Gostivar, Kavadarci, Kicevo, Kocani, Kriva Palanka, Kumanovo, Prilep, Struga and Strumica, and the total capacity of these facilities will equal 30.000 tons per year;

- residues generated from wood cutting in the following Municipalities: Berovo, Bitola, Brod, Valandovo, Vinica, Gevgelia,

Gostivar, Debar, Delcevo, Demir Hisar, Kavadarci, Kicevo, Kocani, Kratovo, Kriva Palanka, Krusevo, Kumanovo, Demir Kapija, Ohrid, Prilep, Probistip, Radovis, Resen, Sveti Nikole, Struga, Strumica, Tetovo, Veles, Stip, Cair and Kisela Voda, and the total capacity of these facilities will be 15.000 tons.

– Residues generated as by-products in agriculture in: Bitola, Valandovo, Gevgelia, Demir Hisar, Kavadarci, Kicevo Kumanovo, Negotino, Ohrid, Prilep, Radovis, Resen, Struga, Strumica, Veles, Stip and Kisela Voda, with total annual capacity of 20.000 tons of briquettes.

Within forest boundaries, there are sufficient areas suitable for other forest products growing. According to the estimates, forest products (curative and other industrial herbs, forest fruits, fungi, etc.) from the area of around 330.000 ha forests and forest land areas (27% of the total forest and forest land area) each year produce around 50.000 tons fresh biomass of other forest products, i.e. around 15.000 tons useful biomass in dry (marketable) state.

The optimal density of road network is technical and economic indicator of the level of accessibility of forests through forest

Hunting productive areas by game types

Table 15

Game type	For hunting	Within national parks
Common deer	269.876 ha	29.000 ha
Roe deer	984.709 ha	40.209 ha
Chamois	90.555 ha	24.165 ha
Wild boar	688.037 ha	21.657 ha
Hare	1.034.625 ha	
Gray partridge	447.910 ha	
Rock redlegged partridge	212.230 ha	
Hunting Pheasant	75.220 ha	

Natural game breeding will be predominant. Artificial breeding will be applied with small game breeding, especially with hunting pheasant and possibly with gray partridge. Combined breeding will be applied with hunting pheasant.

Game population is carried out for common deer, through four developed reproduction centres covering an area of around 250.000 ha; with regard to mouflon

roads, expressed in length meters per hectare forest area, providing for minimum total transportation costs. This is a changeable value depending on specific conditions. In 2020, the density of road network will equal 10.75 m/ha, and the share of soft roads will drop to 77%.

Based on natural conditions and hunting development concept in the country, 11 hunting regions have been recognized. These are: Pelagonia (Prilep, Bitola, Demir Hisar and Krusevo); Ohrid-Prespa (Resen, Ohrid, Struga and Debar); Kicevo-Brod (Kicevo and Makedonski Brod); Polog (Gostivar and Tetovo); Skopje -Kumanovo (Skopje and Kumanovo); Middle Vardar (Veles and Sveti Nikole); Kriva Reka (Kratovo and Kriva Palanka); Bregalnica (Probistip, Kocani, Vinica and Stip); Vlaina – Malesevo (Delcevo and Berovo); Strumica (Radovis and Strumica); Lower Vardar (Kavadarci, Negotino, Valandovo and Gevgelia).

Out of the total territory of the Republic of Macedonia, the following areas are suitable for hunting promotion: for big game - 1.198.312 ha; for small game -1.171.340 ha, or total of 2.369.659 ha (90%).

and fallow deer, 6 breeding and hunting fenced sites will be developed by 2010, on an area of around 2.000 ha; hunting pheasant, in the period up to 2010, will be populated through around 35.000 two-months old huchens, and between 2010 and 2020, population will grow to 55.000 specimens per year.

2.3. MINERAL RESOURCES

Current status

Ore resources in the Republic of Macedonia are diverse, but their reserves have not been sufficiently explored. Metal, non-metal and energy mineral resources have been registered, bearings exploited and mostly insufficiently explored.

Metal mineral resources are widely spread. Lead and zinc ores represented in the eastern part of Macedonia, where their exploitation is carried out in the existing mines Zletovo, Sasa and Toranica, are the richest and of highest quality. Ferrous metals ores (iron, chromium, manganese) contain mainly low percentage of metal or their ore reserves have been exhausted.

Diverse geological composition and geological tectonic evolution of the

terrains in the Republic of Macedonia enabled the creation of high number of bearings, finds and dyes of different non-metal mineral resources. Among them the following are the most promising from economic point of view: carbonate materials (marble, travertine, lime, dolomites, magnesite, marls), silica products (quartz, quartzite, quartz sand, opalite, perlite, tuffs), feldspaths (sodium, potassium), gypsum, architectural and building stone (granite, gneises), basalt, etc.

Energy mineral resources in the country are modest, both by structure and reserves available. Coal in the form of lignite is the richest energy mineral resource, spread in Pelagonia, Berovo-Delcevo, Resen, Struga, Skopje and Kicevo sediment basins.

Quantities of ore reserves of metal mineral resources Table 16

Ores of:		Ore reserves (t)			Potential reserves (t)
		A	B	C ₁	
Antimony	Sb		622.459	250.307	63.865
Arsenic	As		566.477	204.231	
Copper	Cu	608.770	36.991.340	62.695.295	802.943.422
Iron	Fe	1.236.500	8.303.618	8.924.800	30.000
Silver	Ag	5.627.310	15.675.704	24.196.011	691.837.625
Gold	Au	608.770	36.991.340	59.960.295	802.943.422
Manganese	Mn	344.553	2.143.543	3.738.271	1.070.013
Molybdenum	Mo			585.000	
Nickel	Ni	2.869.842	16.004.170	18.812.012	308.975.086
Lead-zinc	Pb-Zn	5.627.310	15.675.704	24.196.011	691.837.625
Chromium	Cr	7.514	16.443	76.026	4.000
Titan	Ti				1.000.000

Quantities of ore reserves of energy mineral resources
Table 17

Energy mineral resources		Ore reserves			Potential reserves
		A	B	C ₁	
Coal	C	77.800.000	232.200.000	179.300.000	1.821.830.000 t
Uranium ores	U ₃ O ₈			368.000	1.539.000 t
Easily flammable shales			175.198.561	48.556.464	200.000.000 t
Peat	A+B+S ₁ reserves = 720.821 m ³				850.000 m ³
Geothermal energy		172,9 MWt			Significant

Quantities of ground water reserves

Table 18

Ground water resources	Reserve category			Potential reserves
	A	B	C ₁	
All types of springs	11,46 m ³ /sek	B + C ₁ = 23,58 m ³ /sek		

Goals

-increasing the level of all mineral resources exploitation in the country, by prioritized and intensive exploitation of lead, zinc and copper and marble finds and dyes;

-application of modern technologies and techniques in mines for raw materials exploitation;

-definition and regulation of the manner, the conditions and the criteria for foreign capital involvement in the overall matter of mineral resources (research, exploitation and processing);

- reduction of environmental degradation in the process of ores exploitation and processing, and (technical and biological) remedy and recultivation of areas degraded and affected by ores exploitation and tailings disposal sites;

- protection of zones, compounds and ore bearings against illegal construction of temporary and permanent building structures.

Planning determinations**-Regionalization of ore finds**

Based on the geological composition, tectonic structure, sedimentation processes and igneous mobility as essential natural predispositions in the creation of ore bearings, finds and dyes, the following six basic mining areas have been recognized in the country:

1. Western Macedonian massif – area on west from Radusa-Skopje-Solunska Glava-Bitola line, up to the national border with Albania.

2. Pelagonia - central part of the national territory, between the village of

Zivojno and the mine of Alsar (close to Macedonian-Greek border on south, through NNW to the line from the village of Dracevica to the village of Vrazalec, at around 10 km south of Skopje).

3. Vardar Zone – along the section from NNW to SSE, from the line between the village of Radusa and village of Tabanovce on the northern national border, through SSE, along the line from the mine of Alsar to the village of Nikolic near Dojran Lake – occupies the central part of the country.

4. Kratovo-Zletovo volcanic area – north-eastern part of the national territory, covering the area between southern slopes of Kozjak Mountain – Kumanovo and Kocani Fields on southeast.

5. Serbian Macedonian Massif – eastern part of the national territory, east from the line between the village of Cetirce (close to the northern border), through Pantelej (Kocani area), Oreovica (area of Radovis), Strumica, Village of Nikolic and eastern border with Bulgaria, in the south-eastern border area with Greece.

6. Kenozoic sediment basins are the youngest lake and probably marine sedimentation basins of different kenozoic age and different lithological and geotectonic structure (Polog, Skopje, Kumanovo, Slavej, Ovce Pole, Delcevo-Pehcevo, Strumica, Tikves, Pelagonia, Resen, Debar and Struga basins).

Resources of priority for geological explorations

Western Macedonian massif:-
Metals – first priority: finds and dyes of iron, iron-manganese and manganese ores; second priority: molybdenum and lead and zinc ores; third priority:

indications of wolfram and copper and molybdenum ores.

-Non-metals (dominant in this region) –first priority: dolomites, limes, marbles, gypsum and travertine; second priority: sienites and quartzite and onyx.

-Waters - first priority: drinking water, karstic springs and thermal water resources (for hydro-geological explorations in the frameworks of future concepts of population water supply and utilization of geo-thermal energy).

-Pelagonia massif: In the domain of geological explorations, high priority is attributed to non-metals and mineral waters, while metals deserve minor attention for the time being.

- Metals - first priority: uranium (as energy source), according to its geological predisposition and number of finds and dyes registered so far; second priority: rare and scattered elements related to Pelagonia granites; third priority: other metals: tin, molybdenum, wolfram, lead and zinc (at indication level).

-Non-metals - first priority: marbles, granites, gneises, diatomaceous non-metals, onyx, disthen and granet (indications of economically significant reserves); second priority: muscovite and feldspaths.

-Waters - first priority: drinking water and mineral water resources (acid and salty).-

Vardar Zone:-Metals - first priority: chromium, iron-nickel ores, antimony-arsenic-thallium ores and copper; second priority: dispersed finds of gold in the deposits of Vardar and its tributaries; third priority: lead and zinc, silver, wolfram, mercury and other metals.

-Non-metals - first priority: clays, marl, limes, basalt and diabases (as construction materials and raw materials of high potentials in terms of new finds discovery); second priority: quartz sands,

amnesties, travertines, talc and roofing slate.

-Waters - first priority: drinking water from alluvial and karstic areas, thermal and mineral water resources.

Kratovo-Zletovo volcanic area: Metals – first priority, potential discovery of polymetallic ores of lead, zinc, copper, bismuth, cadmium, silver, gold and uranium.

- Nonmetals - first priority, tuffs, secondary quartzites, bentonites, opalite and other silicates (with great potential possibilities for economically significant ore bearings discovery; second priority, perlites, alunitite, pirofilitite, zeolites, and other dyes.

- Waters - first priority: thermal mineral water resources as hydro-geothermal fluid; second priority, drinking water from alluvial sources of major rivers.

- Energy resources - first priority, uranium, hydro-geothermal and petro-geothermal energy and bitumenous clayey soils.

- Serbia-Macedonian massif: Specific geological tectonic composition is a predisposition of its metal-genetic potential, which is of particular interest for future geological explorations.

- Metals - first priority, polymetallic ores of lead, zinc, copper, gold and silver; second priority, silverbismuth, cadmium and other related metals in polymetallic ores and areas with antimony and iron-titanium ores.

- Non-metals - first priority, quartz, quartzite and feldspaths; second priority, vermiculites and graphite.

- Waters – second (third) priority, drinking water and thermal mineral waters.

- Kenozoic sediment basins: Metals – third priority, dyes of gold and platinum metals group and rare and scattered elements.

- Nonmetals - first priority, brick clay, sands and gravels (for exploration and provision of new ore bearings and reserves).

- Waters - first priority: drinking water, thermal and mineral waters (with great possibilities for economically significant reserves and bearings discovery).

– Energy resources - first priority, low-heating power coals; third priority, bitumenous clayey soils and sediment relocated uranium dyes.

- Priority resources for exploitation

The available ore reserves stock of mineral resources in existing ore bearings in identified regions, create basis for the planning of future exploitation. The selection (by priority) of specific bearings for exploitation is deemed a dynamic and changeable category, depending on several changeable factors of market, strategic and development (technical and technological) and financial-investment nature.

Western Macedonian massif:

– Metals - first priority, manganese reserves (other metals do not have any significant economic significance).

– Nonmetals - first priority, dolomites, lime, marble, gypsum, travertine, sienites and quartzites (in line with available ore reserves).

– Waters – drinking waters, thermal and mineral waters are of significant potential possibility for exploitation.

Pelagonia massif: Metals - second priority, uranium finds (as metal and mineral resource, but with limited balance reserves).

– Nonmetals - first priority, bearings of marbles, granites, gneises, diatomaceous ores and onyx; second priority, insufficiently defined reserves of feldspaths.

-Waters - first priority: drinking water from alluvial areas and mineral water resources (acid and salty).

Vardar zone: Metals - first priority, ore bearings of copper, ferrous nickel, arsenic-antimony and thallium containing ores, divergent finds of gold and scarce reserves of chromium (of heterogeneous metal origin and different economic significance for exploitation); third priority, insufficiently explored finds of lead and zinc, silver and walfram.

– Nonmetals - first priority, clays, limes, basalts and diabases; second priority, quartz sands, talc and roofing slates.

– Waters - first priority: drinking water from alluvial sources of major rivers, thermal waters (in a form of geo-thermal power carriers) and mineral waters.

Kratovo-Zletovo volcanic area: Metals - first priority, lead, zinc, copper, silver, gold, bismuth and cadmium (most frequently found as complex polymetallic ores; uranium ore bearing in the framework of unique exploitation system of several small uranium bearings deserves economic attention.

– Nonmetals - first priority, tuffs, secondary quartzites, bentonites, opalite opalite crests and other silicates.

– Waters - first priority: thermal mineral waters (geo-thermal energy) and investigation hydro-geothermal systems; third priority, drinking water (scarce, found only in alluvial sources of major rivers).

Serbian-Macedonian massif: Metals – first priority, polymetallic ores of non-ferrous metals of lead, zinc, copper, silver, gold, cadmium and bismuth (with greatest balance and potential reserves); second priority, titanium magnetic and magnetic ores of iron and antimony ores and their reserves.

– Nonmetals – first priority, quartz, quartzite, and feldspaths (with significant balance reserves).

– Waters – with no significant economic significance.

Kenozoic- sediment basins: Metals – insufficiently explored and without any prospect in near future, except iron in certain areas of western part of Macedonia.

– Nonmetals – first priority, brick clays, sands and gravels (as raw materials and natural construction materials of great economic significance).

– Waters – first priority, drinking water, thermal and mineral waters (with great reserves in young lake sedimentation basins, or in their peripheral areas, significant for

water supply issues solving in settlements and spa therapeutic centres).

– Energy resources – first priority, ore bearings of coal – lignite (richest ore bearings and basis of electric power system of the Republic of Macedonia); third priority, uranium.

2.4. WATER RESOURCES AND WATER MANAGEMENT INFRASTRUCTURE

Current status

- Available quantities of water

The Republic of Macedonia covers parts of the basins of Vardar River, Crn Drim River and Strumica River. On its entire territory, 84% of existing water resources are domicile, and only 16% are external waters entering the country.

For the purpose of clearer identification of available and demanded quantities of water on the national territory, the country has been divided into 15 water management areas in the primary basins of the rivers: Vardar, Crn Drim and Strumica.

Specific run-offs by water management areas for the period 1961/1990.

Table 19

Basin	Water management area	Annual average flow		75% dry year		98% dry year	
		m ³ /sec	W 10 ⁶ m ³ /year	m ³ /sec	W10 ⁶ m ³ /year	m ³ /s	W10 ⁶ m ³ /year
1. Vardar	Polog	25,23	795,0	21,40	675,0	8,80	277,0
	Skopsko	65,33	2.060,0	55,20	1.741,0	23,50	741,0
2. Treska	Upper Treska	27,35	862,0	18,30	577,0	9,10	287,0
3. Peinja	Peinja	12,56	396,0	10,10	318,0	5,10	161,0
4. Vardar	Middle Vardar area	134,50	4.242,0	101,00	3.185,0	43,60	1.375,0
5. Bregalnica	Upper Bregalnica	6,74	212,0	4,85	153,0	2,68	85,0
	Mid.& L. Bregalnica	13,70	432,0	9,33	294,0	3,90	123,0
6. Crna Reka	Pelagonia	21,61	682,0	15,80	498,0	5,13	162,0
	*Mid.&L.Crna Reka	29,30	924,0	21,45	676,0	7,75	244,0
7. Vardar	Lower Vardar	144,90	4.570,0	106,00	3.343,0	44,90	1.416,0
8. Dojran	Dojran	No information on the run-off available					
9. Strumica	Strumica	4,20	132,0	1,70	54,0	0,48	15,0
10. Crn Drim	Prespa	No information on the run-off available					
	Ohrid-Struga	No information on the run-off available					
	Debarsko	52,00	1.640,0	26,30	829,0	12,60	937,0
Total output:		201,10	6.342,0	134,00	4.226,0	58,77	1.853,0

* Information taken from Rasimbegov Most concerning basin growth, with reduced specific run-off and taking into account the balance on Demir Kapija for Vardar River.

In the Republic of Macedonia, 4.414 springs have been registered, with a total yield of 31.43 m³/sec., or 991.90 h 10⁶ m³/year, out of which 58 have yield above 100 l/sec.

Eastern part of Macedonia, i.e. the whole territory on the left of Vardar River is poor in

water resources. Only seven springs with yield higher than 10 l/sec. have been registered in this part.

There are three natural lakes with relatively huge quantities of water.

Area, water quantity in natural lakes in the Republic of Macedonia and their distribution by countries

Table 20

Lake	Total area km ²	Distribution by countries			Total quantity of water 10 ⁶ m ³
		Republic of Macedonia km ²	Republic of Albania km ²	Republic of Greece km ²	
Ohrid Lake	348.8	229.9	118.9		50.683.430
Prespa Lake	274.0	176.8	49.4	47.8	4.775.000
Dojran Lake	43.0	27.4		15.6	427.000

For the purpose of available hydrological potential utilization, 19 big and more than 100 small accumulations have been developed on rivers, with total volume of 1.854 million m³ water.

There is no sufficient and appropriate information on the quality, yield and quantity of ground water resources. More detailed investigations were conducted in the period between 1963 and 1975, during which hydrological units for the basins of Upper Vardar, Treska, Crn Drim, Crna Reka, Lower Vardar Rivers and Eastern Macedonia have been established.

The finds of thermal, thermo-mineral and mineral waters have been identified as specific type of ground water resources, with yield of around 29.10 m³/year.

The share of geothermal springs and their power in the total demand for energy in the Republic of Macedonia is 0.5% per year.

Water use

In the Republic of Macedonia, all municipal centres have developed public water supply systems, but all of them cope with insufficiency of water quantity. Current water quantities taken from springs, wells, waterways and accumulations equal 317.284 h 10³ m³/year, while demands established on the basis of applicable norms on water consumption are as follows:

- population 207.994 h 10³ m³/year
- tourists 6.258 h 10³ m³/ year
- industry 274.147 h 10³ m³/ year
- total: 488.399 h 10³ m³/ year

Republic of Macedonia has around 657.689 ha arable agricultural land area, out of which 370.850 ha, or 56% are suitable for irrigation. Irrigation systems cover 126.617 ha, requiring water quantity of 899.335 h 10³ m³/year. At present, only 50.000 to 60.000 ha are irrigated.

With most of the main channels and secondary networks of irrigation systems, the status of lining is poor and installed hydro-mechanical equipment is not always in proper functioning condition, leading to

water losses in the range between 20 and 40%.

For the purpose of fish breeding, fish ponds with an area of 695 ha have been constructed, with annual production of 445 tons, demanding water quantity of 16.68 h 10⁶ m³.

Out of the total technically usable hydro-power potential, amounting to 6.436 GWh in the Republic of Macedonia, so far 30.5% have been used, out of which 23.6% by hydro-power plants in the Vardar River basin, and 6.9% by hydro-power plants in Crn Drim River basin.

Power consumers, apart from hydro-power plants, include certain number of thermal-power plants consuming 1.7 m³/sec water for their industrial and technological needs.

- Water resources protection

Sewer networks coverage of more than 80% is available in 12 populated places; between 60% to 80% in 8; and below 60% in 5 populated places.

In the Republic of Macedonia, there are three municipal wastewater treatment plants, in: Makedonski Brod, Ohrid and Struga, connecting also part of tourist areas Dojran and Resen.

Low percentage of industrial wastewater is treated, mainly through mechanical treatment.

The status of drainage systems in the Republic of Macedonia is not satisfactory, because of the partial coverage of affected areas against surplus humidity (80.395 ha), as well as insufficient funds for maintenance.

Floods by hundred years high waters pose threat to 102.000 ha, out of which 87.000 ha are in Vardar River basin, 6.000 ha in Crn Drim River basin and 9.000 ha in Strumica River basin. 20-years high waters affect 86.000 ha and 10-years high waters affect 67.000 ha.

Out of the total length of waterways (559.6 km) requiring regulation, only 180.0 km have been regulated. The length of erected protection embankments is 359 km

(protecting 152 settlements, 122 km railway lines, 555 km roads and 137.000 ha land.)

The Republic of Macedonia belongs to the group of most active erosion processes in Europe. 96.50% of the national territory is affected with different intensity erosion. Stronger categories of destruction (I-III) affect 36.65% of the national territory. Sediment production is $14.7 \text{ h } 10^6 \text{ m}^3/\text{year}$ and run-off $6.1 \text{ h } 10^6 \text{ m}^3/\text{year}$.

Sediment production in the basins of accumulations is $6.8 \text{ h } 10^6 \text{ m}^3/\text{year}$ and run-off of $2.7 \text{ h } 10^6 \text{ m}^3/\text{year}$, determined through measurement of deposited sediments in major accumulations and estimates and calculations in smaller accumulations.

Goals

- Provision of sufficient quantities of proper quality water, principally for the population water supply and for all other activities based on the current and planned development of the Republic of Macedonia, as starting grounds and goal within the development of water management sector;

- Water treatment as economic category, providing for optimum water management in its complex utilization;

- Maximum utilization of local sources of surface and ground water resources for water supply;

- Permanent exploration of ground water resources, up to the level required to define potential resources;

- Establishment of protection zones around present and future potential water sources (surface waterways, ground water resources and accumulations) and specification of protection measures;

- Prevention of certain partial solutions that could impede or prevent future development of complex water management solutions;

- Maximum intake of potential water sources by regional systems, to enable water transfers from one into another water management area for the purpose of long-term water supply in dry water management areas;

- Utilization of major water sources of surface and ground water resources, as well as multi-purpose accumulations (before all, accumulations in upper areas of basins) as main water sources for regional systems. Water supply sources should be dimensioned at 98% coverage;

- Rehabilitation and modernization of water supply and irrigation systems in order to reduce water losses and increase the level of utilization;

- Provision of water for technological processes from waterways and accumulations (with 98% coverage), by maximum rationalization of water consumption, multi-purpose water use and modernization of technological processes;

- Erection of water accumulations for annual and multi-annual water flows balancing;

- Use of multi-purpose water accumulations as main sources for irrigation. Irrigation should be with 75% coverage;

- Application of new irrigation techniques for the purpose of maximum water utilization;

- Full utilization of hydro-potential within multi-purpose systems. Small hydro-power plants may be constructed independently, on sites that will not affect conditions for implementation or functioning of major regional, energy or melioration systems;

- Active defense against floods through construction of water accumulations, to mitigate flood waves of high waters and passive defense through construction of line protection systems.

Planning determinants

- Water supply

The development of water supply systems is planned to follow these directions:

- Reconstruction and reclamation of existing system, in order to reduce the losses to the realistic limit of 15 to 20%;

- Extension of existing water supply systems, both local and regional, through

new water sources intake, in order to achieve maximum utilization of installed facilities; – Development of new water supply systems (local and regional).

Total demand for water supply by population and industry, by water management areas in 2020

Table 21

Water management area		Population h 10 ³ m ³ /year	Tourists h 10 ³ m ³ /year	Industry h 10 ³ m ³ /year	Fish ponds h 10 ³ m ³ /year/	Total h 10 ³ m ³ /year
1.	Polog	41.811	462	20.09	55.000	117.364
2.	Skopje	110.15	1.380	88.97	2.000	202.509
3.	Treska	9.753	85	14.35	76.000	100.189
4.	Pcinja	27.251	208	14.35	4.000	45.810
5.	Middle Vardar	21.027	208	31.57	61.000	113.806
6.	Upper Bregalnica	6.778	85	8.610	28.000	43.473
7.	Middle& Lower Bregalnica	25.254	312	24.25	10.000	59.819
8.	Pelagonia	39.770	423	40.18	50.000	130.375
9.	Middle and Lower Crna Reka	734	50	/	/	784
10.	Lower Vardar	6.307	85	1.435	/	7.827
11.	Dojran	613	462	143	/	1.218
12.	Strumica	17.921	312	34.44	/	52.675
13.	Prespa	2.800	924	1.435	9.000	14.159
14.	Ohrid – Struga area	20.695	6.791	5.740	22.000	55.226
15.	Debar	5.519	85	1.435	107.000	114.039
Total:		336.388	11.872	287.013	424.000	1.059.273

Irrigation

Development of hydro-melioration systems is expected to be oriented towards:

– Reconstruction and reclamation of existing irrigation systems covering an area of 126.617 ha;

– Extension of existing irrigation systems with primary and secondary networks, covering an area of 33.368 ha;

– Development of new irrigation systems to cover an area of 107.182 ha.

Overview of water management areas of new areas to be irrigated by 2020 and demanded water quantity for existing and new areas

Table 22

Water management area		New areas for irrigation and extension of existing systems	New areas /ha/	W for new areas /10 ³ m ³ /y/	W total in 2020 /10 ³ m ³ /y/
1.	Polog	Kunovo, Raven, Vratnica, s. a.	14.364	97.787	189.715
2.	Skopje	Skopsko Pole – left side, Skopsko P.-right sides. a.	20.165	140.641	151.090
3.	Treska	Kicevo Pole*, B. Dolenci*-Celopek, s. a.	1.340	6.777	14.751
4.	Pcinja	Kriva Palanka, Slavicko Kratovsko, s. a.	7.760	48.436	100.713
5.	Middle Vardar	Povardarje I, II, III, Lisice, Pepeliste* I, II, III, s. a.	7.379	59.321	99.191
6.	Upper Bregalnica	Malesevsko Pole*, Delcevsko Pole, s.a.	8.602	46.371	53.661
7.	Middle& Lower Bregalnica	Bregalnica, Argulica, Zletovica, Mavrovica*, s.a.	8.365	71.595	306.499
8.	Pelagonia	Prilepsko Pole*, Bucin, Kazani*, s.a.	37.277	212.290	356.542
9.	Lower Crna Reka	Tikves*, Bosava*, Drenevo*, s.a.	9.255	64.516	152.510
10.	Lower Vardar	Miravci, Konsko, Bogdanci, Smokvica, Miravsko, Crnicansko, s.a.	8970	62.912	115.782
11.	Dojran	Dojransko Pole, Nikolisko Pole	345	2.652	4.574
12.	Strumica	Mantovo*, Turija*, Podares-Strumica, s.a	8.300	51.402	169.343
13.	Prespa	Prespansko Pole*, s.a.	2.200	11.536	30.889
14.	Ohrid – Struga	Velmesko, Belciski, Podmolje, s.a.	5.360	32.241	58.480
15.	Debar area	Debarsko Pole*, s.a.	868	5.172	9.245
Total:			140.550	913.504	1.812.985

s.a. – small accumulations; * - extension of existing systems

The area of 267.167 ha planned for irrigation in 2020 represents 72% of the total area suitable for irrigation of 370.850 ha in the country. The remaining 103.683 ha, envisaged for irrigation in the post-plan period (after 2020), require provision of 695.566 h 10³ m³ water.

The main precondition for rationale use of water for irrigation in terms of proper maintenance and use of hydro-melioration systems (HMS) is reduction of water losses currently in the range from 20% to 40%. The calculation of demanded water quantities in the coming period has taken into account losses of 10%, that will be achieved through development of closed (pipeline) network, reconstruction and reclamation of existing HMS into closed network and application of irrigation technique “drop by drop”.

Fishery

Extension of fish ponds for trout breeding is projected for the coming period, for new 4.21 ha and fish breeding for additional 750 ha with required water quantity of 212.166 h 10³ m³/year, out of

which 15.000 h 10³ m³/year are counted as loss.

Cage fish breeding is not allowed in accumulations intended as water supply sources for populated areas.

Thermal power plants

For the purpose of required power generation, construction of new thermal power plants is projected, with total designed power of 535,0 MW, demanding water quantity of 0.8 m³/ses.

Balance of available and demanded waters

Water balancing has been made through comparison of total annual demand and total annual run-off in surface waters. Balance analysis has been conducted on waters entering the country from the basins located in neighbouring countries, with average run-off of 1.014 h 10⁶ m³/year. In long-term perspective, we should not expect significant reduction of waters of Lepenec and Pcinja Rivers, related to their utilization in the Republic of Serbia.

Available and demanded waters in 2020

Table 23

Water supply area	Total demand 10 ⁶ m ³ /y		Available water in average year 10 ⁶ m ³ .year					Available water in 75% dry year 10 ⁶ m ³ .year					Available water in 98% dry year 10 ⁶ m ³ .year				
	W	BM	Wa	Wo	Wr	ΔW	We	Wp	W	Wa	ΔW	We	Wa	Wo	Wpv	ΔW	We
1	2	3	4	5	6	7=4+5-(2+3)	8=3+6+7	4	5	6	7	8	4	5	6	7	8
Polog	307	80	796	/	140	409	629	675	/	140	288	508	277	/	140	-110	220
Skopje	354	206	502	1.371	191	1.313	1.710	489	1.064	191	993	1.390	177	486	191	103	500
Treska	115	86	763	/	94	562	742	577	/	94	376	556	287	/	94	86	266
Pcinja	146	40	396	/	57	210	307	318	/	57	132	229	161	/	57	-25	97
Midd.Vardar	213	434	430	2.017	120	1.800	2.354	156	1.619	120	1.128	1.682	106	597	120	56	610
Upp.Bregal.	98	21	212	/	50	93	164	153	/	50	34	105	85	/	50	-34	71
Mid.&L.Breg	366	43	220	164	111	-25	154	141	105	111	-163	154	38	71	111	-300	95
Pelagonia	486	68	682	/	183	128	379	498	/	183	-56	195	162	/	183	-390	143
Mid&Lcrna	154	92	242	379	32	375	499	178	195	32	127	251	82	143	32	-21	124
LowerVardar	125	457	328	3.007	29	2.753	3.213	158	2.087	29	1.663	2.123	41	829	29	288	748
Dojran	6	0	14	26	2	34	/	6	26	2	26	/	1.6	26	2	22	/
Strumica	234	13	132	/	89	-115	102	54	/	89	-193	102	40	/	89	-207	/
Prespa	46	30	296	/	50	190	270	169	/	50	63	143	72	/	11	-34	41
Ohr-Str.	113	96	660	270	59	721	876	376	143	29	310	435	160	41	66	-8	162
Debar	124	164	684	876	110	1.272	1.564	390	435	110	537	811	165	162	110	47	374

W-water supply; B.M.- biological minimum; Wa-available water from water management area own basin; Wo-water entering from other water management area; Wr-reversible waters; We-water exiting from water management area; DW- difference between available and demanded waters

The overview of water balancing shows that water transferring is required from water richer to water deficit facing water management areas, i.e. transferring of water from water management areas of Polog, Treska, Middle and Lower Crna, Lower Vardar, Ohrid-Struga and Debar areas.

By the construction of water supply system "Gjavato", water transfer has been enabled from water management area

"Lower Vardar" to water management area "Dojran". The main purpose of the system is to supply additional quantities of water to Dojran Lake, but this system also supplies the required water quantity for water supply of the population in Bogdanci, population, tourists and industry in Dojran area and for irrigation of additional 1.090 ha arable land areas.

Water supply and irrigation sources

Future water supply sources

Table 24

Water supply system	Populated place	Water sources	
		Current	Potential
1. Polog	Tetovo, Gostivar, villages	sp. Vrutok, Vakuf, Uliveric Izvori and Golemi Izvori	gw. Studena Voda; Pena R.-ac. Lesnica; ac. Mavrovo
2. Skopje	Skopje, villages	sp. Rasce, gw. Nerezi-Lepenec	Kadina Reka-ac. Paligrad; R.W.S. "Treska"
3. Studencica	Kicevo, M.Brod, Prilep, Krusevo, villages	sp. Studencica, sp. Krusevo, gw. Prilep	sp.Pitran; Baciska Reka-ac. Tajmiste, ac.Podvis; Treska R.; ac. Grasnica
4. Kumanovo	Kumanovo, villages	ac. Lipkovo	Kriva Reka - ac. Vakuf; gw. Otljanski Vrbi; R.W.S. "Treska"; ac. Slupcanka
5. Kriva Palanka	K. Palanka, villages	sp. Kalin Kamen	Stanecka R.-ac. Stanecka
6. Veles	Veles, villages	gw. Sorka, Topolka River	Topolka R.-ac. Lisice
7. LUKAR	Kavadarci, Negotino, vill.	sp. LUKAR I and II, Kosmatec, Stara Reka	Crna R.-ac. Tikves; Dosnica R.- ac. Dosnica
8. Berovo-Pehcevo	Berovo, Pehcevo, villages	ac. Ratevska Reka	Bregalnica R.; Lutacka R
9. Delcevo	Delcevo, villages	gw.Trboteviste, gw. Delcevo, Losana River -ac. Losana	
10. Mak. Kamenica	Mak. Kamenica, villages	Kamenica River	
11. Zletovica River	Stip, Probistip, Sv. Nikole, Kratovo, villages	Zletovica River, gw. Stip Lake, Mavrovica River, ac. Mavrovica, gw.Ovce Pole	Zletovica R.-ac. Knezevo
12. Orizari River	Kocani, Vinica, villages	gw. Grdovski Orman, Gradecka River, gw. Ademica	Orizari R. -ac. Recane
13. Bitola	Bitola, villages	Dragor system, ac. Strezevo	
14. Demir Hisar	Demir Hisar, villages	gw. Demir Hisar	sp. Zeleznec
15. Valandovo	Valandovo, villages	gw. Tatarli, sp. Manastir, and sp. Izvor	
16. Gevgelia	Gevgelia, villages	gw. Vardar, gw. Moin	H.S. "Konjsko"
17. Dojran	Dojran	gw. Deri Bas, gw.Toplec, gw. Mrdaja,	WS"Gjavato"
18. Bogdanci	Bogdanci	gw Gjavato	WS"Gjavato"
19. Strumica	Strumica, villages	Turija River-ac. Turija and Vodoca River-ac. Vodoca	Plavaja R. - ac. Podares, Orehovica R.-ac.Orehovica R., R.W.S."Treska"
20. Radovis	Radovis, villages	gw. Voislavci, sp. Glad; Radovis River, Kriva Lakavica River- ac. Mantovo	Plavaja R. - ac. Podares, Orehovica R. -ac. Orehovica, R.W.S."Treska"
21. Resen	Resen, villages	sp. Sv.Spas; gw. Carev Dvor	
22. Ohrid-Struga	Ohrid, Struga, villages	sp: Biljanini Izvori, Letnicki, Bej Well, Sv. Ilija, Sum, Gorna Belica, gw. Studenciste; Ohrid Lake	sp. Sveti Naum, Vevcani, Dzepin
23. Rosoki	Debar, villages	sp. Rosoki	

sp.- springs; gw.-ground waters; ac.-accumulation

Rural settlements that are not covered by water supply systems take water from local water sources (surface waters, local springs, ground water resources).

Water transferring from water rich areas to dry ones will provide water for the areas of Skopje, Pcinja, Middle and Lower Bregalnica and Strumica. In order to supply the

demanded water quantities in the said areas, construction of Regional Water Supply System "Treska" with sub-system "Crna" has been proposed. Sources proposed to be used for this purpose include: Treska River - ac. Kozjak, Kaludjerica, Podvis, Tajmiste, Grasnica, Crna River- ac. Cebren, Galiste and Tikves.

Future sources of irrigation by water management areas

Table 25

Water management area		Sources of water for irrigation
1.	Polog	Vardar - Zelino, Lakavica River – ac. Kunovo
2.	Skopje	Treska R.- ac. Matka II; R.W.S."Treska"; Kadina R. - ac. Paligrad, ac. Gumalevo
3.	Treska	Baciska R. - ac. Grasnica, ac. Tajmiste; Treska River – ac. Podvis
4.	Pcinja	Kriva Reka - ac.Vakuf; Pcinja River
5.	Middle Vardar	Topolka River - ac. Lisice; Vardar River - ac. Veles, Bosava River - ac. Barovo; Dosnica River - ac. Dosnica
6.	Upper Bregalnica	Bregalnica River-ac.Razlovci
7.	Midle&Lower Bregalnica	Zletovica River - ac. Knezevo; Kriva Reka - ac. Vakuf; Orizarska R. - ac. Recani; Kozjacka R. - ac. Bargala; Bregalnica River- ac. Jagmurlar; R.V.S "Treska"
8.	Pelagonia	Crna River- ac.Bucin, ac. Cebren; Treska River
9.	Midle&Lower Crna Reka	Mrezicka River- ac. Livadi; Prelozi; Blato
10.	Lower Vardar	Konjska - ac. Konjsko; Vardar River- ac. Gradec, ac. Kovanska, ac. Petruska, WS "Gjavato"
11.	Dojran	WS "Gjavato"
12.	Strumica	Podareska River - ac. Podares; Oraovecka R. - ac. Oraovecka, R.W.S. "Treska"
13.	Prespa	Prespa Lake, Bolnska River- ac. Bolno
14.	Ohrid-Struga area	Sateska River - ac.Izdeglavje; Koselska River – ac.Vapila
15.	Debar area	

Micro and small accumulations, the number of which should increase in the coming period in accordance with the adopted studies on micro and small accumulations developed at regional level, should be counted as possible irrigation sources.

Dams and accumulations

According to the projection, the total usable accumulation volume (both existing and planned) amounts $3.268 \times 10^6 \text{ m}^3$, or 49% of existing run-offs in the country, enabling annual balancing and regulation between run-offs and demand.

Overview of dams (accumulations) planned for construction by 2020

Table 26

Water management area		Dam		Waterway	Volume		Purpose
					Gross	useful	
1	Polog	1	Lukovo Pole	Upper Radika	65,0	30,0	e,r,i,wr,cf
2	Skopje area	2	Paligrad	Kadina Reka	27,0	25,0	e,r,i,wr,cf,w
3	Treska	3	Matka II	Treska	68,0	5,0	e,r,w,i
		4	Tajmiste	Baciska	4,4	4,0	e,w,i,wr,r
		5	Grasnica	Baciska	32,0	31,0	w,i,wr
4	Pcinja	6	Vakuf	Kriva Reka	166,0	150,0	e,r,i,w,wr,cf
5	Middle Vardar	7	Veles	Vardar	214,0	37,0	e,r,wr,cf
		8	Lisice*	Topolka	28,0	24,0	w,i,wr,cf
6	Upper Bregalnica	9	Razlovci	Bregalnica	64,0	52,0	e,r,w,i,wr,cf
7	Middle and Lower Bregalnica	10	Recane	Orizarska	24,0	22,0	e,r,i,w
		11	Knezevo	Zletovska	26,0	24,0	e,r,w,i,wr,cf
		12	Bargala	Kozjacka		5,0	w,r,i
		13	Jagmurlar	Bregalnica	195,0	135,0	w,r,i
8	Pelagonia	14	Bucin**	Crna Reka	240,0	215,0	w,r,i,wr,cf

9	Mid.&Lower Crna Reka	15	Cebren	Crna Reka	915,0	690,0	w,r,i,oy,cf
		16	Galiste	Crna Reka	356,0	266,0	w,r,i,e,wr,cf
10	Lower Vardar	17	Dosnica	Dosnica	16,0	14,5	w,i,e,cf
		18	Konjsko	Konjska	13,0	12,0	w,e,r,i,wr,cf
		19	Gradec	Vardar	110,0	40,0	e,r,i,wr,cf
		20	Kovanska	Kovanska	10,0	7,5	w,i,e,r,wr,cf
		21	Petruska	Petruska	4,30	3,30	w,i,e,r,wr,cf
11	Strumica	22	Podares	Plavaja	30,0	25,0	w,r,i,wr,cf
		23	Oreovicka	Oreovicka	6,0	5,0	w,r,wr,cf
12	Ohrid-Struga area	24	Izdeglavje	Sateska	2,5	2,0	r,i,wr,cf
		25	Vapila	Vapilica	1,1	1,0	r,i,wr,cf
13	Debar area	26	Tresonce	Mala Reka		1,0	e,r,wr,ki
	Total:					2.086,0	

w-water supply; i-irrigation; e-energy; wr-small waters refining; cf-floods control; r-sediments retaining; * dams under construction; **possible alternative to ac. Bucin together with accumulations Zvan, Obednik, Zurce, Dolenci and Virovo

Apart from the above accumulations, construction of around 100 small accumulations has been projected.

According to the relevant documentation elaborated so far, the main purpose of the projected accumulations Cebren and Galiste on Crna River is electricity production. However, during the water balancing by water management areas, it has been concluded that upon satisfying the demand in up-stream water management areas of Cebren and Galiste projects, the quantity of water intended for electricity production will drastically reduce, which will be even more emphasized in the post-planning period when the overall areas envisaged for irrigation in Pelagonia (109.966 ha) will be irrigated.

Taking into account the fact that water management can not respond to demand without surface water accumulation, areas envisaged for establishment of new 24 accumulations should be protected even beyond 2020.

- Waters protection against pollution

The expected quantities of wastewater within the planning period are:

- population 255.067,5 m³/year
- tourists 9.681,1 m³/ year
- industry 229.611,2 m³/ year
- total: 494.359,8 m³/ year

It is a planning commitment to preserve high quality of springs water, to improve the quality of surface and ground waters, and maintain them within legally prescribed quality. Priority of protection is attached to

waters belonging to I and II class, intended to be used for water supply of the population. Quality protection may not be provided partially, but it is a combination of technological, water management, economic and organizational measures and continuous work. The following is proposed:

Construction of sewerage systems and wastewater treatment plants for major urban and gravitating rural settlements, to collect 83% of municipal wastewater.

Sewerage systems in settlements should be separated (different collectors for waste and storm waters).

Conception of sewerage systems for major populated areas by construction of local wastewater treatment plants. The accent has been placed on the construction of regional sewerage systems and joint treatment of wastewater whenever it is possible under existing technical and economic conditions.

Completion of initiated systems for protection of Ohrid, Prespa and Dojran Lakes against wastewater.

Construction of appropriate industrial wastewater treatment plants, with modern technology generating more efficient results.

Industries that discharge wastewater in urban sewerage network should provide pre-treatment of toxic industrial wastewater.

With regard to new industrial facilities, construction of wastewater treatment plant prior to their putting into operation. Costs related to water protection against pollution should be treated as part of the activity.

Implementation of legislation measures and dis-incentives systems of charges for untreated wastewater discharge, in order to achieve compliance with the prescribed quality of watercourses.

Positioning of clean water intakes downstream of discharge points of industrial facilities generated wastewater.

Discharges of waste water from thermal power plants to remain within the limits specified in studies on the impact on the recipient.

Solid waste control through sanitary landfills construction.

Protection of water supply sources through protection zones establishment.

Space protection against erosion

The space protection against erosion is of social relevance to the country, including protection of urban and agricultural areas, as well as infrastructure facilities. In order to provide for normal performance of this activity, in line with the development needs of the country, it is necessary to establish legal framework for space protection against erosion and regulate the protection against erosion within the overall environment protection.

The space protection against erosion should be performed through combined measures, such as:

- purpose controlled use of areas inclined to erosion;
- terrace establishment, intensive forestation of erosion active areas and appropriate forests treatment;
- regulation of turmoil streams through building structures erection;
- special protection measures against steep slopes and river banks cracking, falling down or sliding.

By regulating turmoil streams of I and II category of destruction capacity covering 10.15 % of total areas affected by erosion

processes, high level of remedial of erosion prone areas and regulation of turmoil streams will be achieved.

Protection of accumulations against filling with sediment

The process of accumulations filling with sediments is unpreventable. Any accumulation will ultimately be filled with sediment.

Republic of Macedonia has limited space for accumulations, and if they are filled with sediment, it will lose the combat for water and survival.

In order to preserve the storage capacity of accumulations and prolong their utilization period, the following measures should be undertaken:

- monitoring of the process of accumulations filling;
- investigation of causes, effects and mechanism of the process itself, in order to be able to intervene in the erosion process slowing down within the basin of the accumulation;
- undertaking of anti-erosion measures, especially biological (forestation of degraded terrains, forests reclamation, grass planting and reclamation of pastures), with existing accumulations preceding the areas where new accumulations are planned.

Drainage systems

In the coming period, drainage systems development is proposed to drain an area of 3.500 ha in total, or 4.1% of the systems established so far, corresponding to 82.195 ha.

The construction of projected drainage systems will meet all requirements for new drainage systems development, provided that the established norms on irrigation are observed.

Overview of current and future drainage systems

Table 27

Water management area		Areas for drainage (ha)		Total (ha)
		Current areas	Future areas	
1.	Polog	165	300	465
2.	Skopje	6.600	/	6.600
3.	Treska	/	600	600
4.	Pcinja	/	900	900
5.	Middle Vardar	/	300	300
6.	Upper Bregalnica	100	/	100
7.	Middle and Lower Bregalnica	7.700	/	7.700
8.	Pelagonia	54.150	/	54.150
9.	Lower Vardar	/	800	800
10.	Strumica	9.000	/	9.000
11.	Prespa	1.800	/	1.800
12.	Ohrid-Struga area	2.680	600	3.280
Total:		82.195	3.500	85.695

2.5. ENERGY SOURCES AND ENERGY INFRASTRUCTURE

Current status

Explorations of energy resources carried out in the Republic of Macedonia up to date indicate relatively modest energy potential, affecting directly the possibilities for meeting the demand for energy from domestic sources. Exploited forms of energy include coal (lignite with low heating value), fuel wood and wood residues, hydro power and geo-thermal power (the group of shallow overflow hot water resources). There are potential possibilities for exploitation of nuclear resources, energy generation from biomass, energy from oil slate, wind power and solar power. Transformed forms of currently produced energy, providing also realistic possibilities for future production, include oil derivatives, electricity and heat energy.

The share of individual energy forms in the overall energy delivered to consumers is as follows: solid fuels - 20%, liquid fuels - 40%, electricity - 20% to 30% and heat energy - 10% to 15%. The share of alternative energy forms, namely gas fuels and geo-thermal resources is negligible. The main characteristic of energy consumption is the constant increase in the share of fuel wood, geo-thermal energy, liquid fuels and electricity, and reduction in the share of coal, crude oil and heat energy.

The gross available energy consists of energy delivered to consumers with a share of 35%-45%, energy consumed for power transformations with a share of 54%-64%, energy losses in transmission and distribution up to 1%, and energy required for power generation plants operation with 2-3%.

Most part of the demand for energy is supplied from domestic sources, and the shortage is satisfied by import. The share of local production in energy demand of the energy system increased from 19.8% in 1980 to 61.8% in 1995, resulting from continuous putting into operation of thermal power plants of REK Bitola in the course of 1980s.

Basic characteristics of the energy system development in the Republic of Macedonia have been changing subject to social and economic relations development and political changes. Dimensioning of certain production and consumption facilities has been based on the structure of economy and social development, that have undergone real changes. Construction of large scale industrial facilities with share in energy consumption as high as 40%-50%, and relatively lower share in the gross domestic product (42%-47%) has been notable. The energy structure is also unfavorable in terms of energy types, with industry share in consumption of more than 60% in the total electricity consumption.

Electricity production is carried out in existing thermal power plants in Negotino,

Bitola 1, 2 and 3 and Oslomej, with a total installed capacity at generator threshold of 1.010 MW and potential electricity production at average annual operation of 6.250 hours, of around 6.312 GWh/year; 13 large and medium scale hydro-power plants with a total capacity of 458.7 MW and small scale hydro-power plants with a total capacity of 37 MW; five industrial heat power plants with 1%-5% share. The total electricity production of 2.011 GWh in 1980 increased to 6.181 GWh in 1995, satisfying 46%, and 100%, respectively, of demand for electricity in the Republic of Macedonia.

Steam, warm and hot water production in the Republic of Macedonia has been recorded through industrial boiling plants, industrial heating plants, public boiling plants and agricultural boiling plants. The total installed capacity of industrial boiling plants amounts 1480 MW, public boiling plants 522 MW, and agricultural boiling plants 522 MW. The share of boiling plants in the total heat power production in the considered period is 65%-70%, and the share of heating plants is 30%-35%.

Major part of the demand for oil derivatives is satisfied from the production of OKTA crude oil refinery in Skopje, which has designed capacity of 2.500.000 t/year. So far, production in the Refinery has varied in wide ranges, but it has not operated with its full capacity in none of the years.

The construction of the gas pipeline Skopje-Thessalonica has greatly relieved crude oil transportation to OKTA Refinery. The length of the gas pipeline through Macedonia is 143 km, with annual transportation capacity of 2.500.000 tons of oil.

The main elements of the system of electricity transmission include long-distance power transmission lines and transformer stations for voltage level of 110, 220 and 400 kV. By 2003, 64 transformer stations with transmission proportion 110/X kV/kV and total installed capacity of 3.650 MVA, two transformer stations 220/110 kV/kV and capacity of 600 MVA and three transformer

stations 400/110 kV/kV and capacity of 1.800 MVA, as well as 409.2 km of 400 kV long-distance power transmission lines, 103,2 km of 200 kV long-distance power transmission lines, 22,5 km 150 kV long-distance power transmission lines and 1552,7 km long-distance power transmission lines of 110 kV voltage level in total were constructed within the electric power system of the Republic of Macedonia.

The idea for natural gas introduction as energy resource that will provide for more secure and better quality operation of energy generation complex of the Republic of Macedonia, as well as environment protection, was partially implemented in the period 1997/98, through the construction of the branch of the international transit gas pipeline system from the village of Zidilovo (Deve Bair) to Skopje. The gas pipeline Zidilovo-Skopje has a total length of around 120 km. The agreed quantity of gas intended to consumers in our country amounts $800 \times 10^6 \text{ Nm}^3$ /year. Five main regulation stations have been constructed, too.

Goals

- adjustment of economic development to prior defined energy production growth, based on realistic energy and financial capability of the country;
- reduction of specific energy consumption per product unit and industry restructuring towards production processes and technologies generating the same social product at lower energy consumption;
- rational utilization of domestic energy resources, optimum use of available energy and reduction of import dependence;
- guidance of development of certain areas in line with realistic possibilities, specific circumstances and potential opportunities;
- balancing energy consumption, production and transmission in all parts of the country;
- adjustment of gas and heat generation systems by combined heat and electricity production;

- utilization of waste power from industrial and power plants;
- improvement of quality and reliability of the operations of electricity transmission network;
- increase in electricity exchange with neighbouring countries through inter-connection links strengthening;
- projection of corridors for oil and gas pipelines, as well as product line development to neighbouring countries;
- more efficient reclamation of degraded areas in abandoned open pits and overlay trash in internal disposal sites;
- environmental protection by reduction of harmful matters emission through improved energy efficiency (use of better quality fuels and gases purification prior to their release into the environment);
- increase of environmentally safe energy production.

Planning determinants

The strategy for energy development will be formulated by scenarios of lowest and highest possible sustainable economic

development of the Republic of Macedonia (low and high option).

The gross demanded energy under the electric power system consists of energy delivered to direct consumers (industry, transport and other consumers), energy as transformation input, energy for power generation plants operation and losses of energy in its transmission and distribution. According to the resulting projection of the gross energy demand in 2020 (low/high option), the demand amounts 373.463/430.620 TJ, representing an increase of 2.7/3,1 times compared to 1995, with average annual growth rate of 4/4.6%. In gross energy demand, the share of energy delivered to consumers in both options is above 36%, energy demanded for power transformations around 60%, energy for power generation plants operations around 3.5% and energy losses in transmission and distribution around 1%. The share of local production in gross energy demand is 64/67% in 2010, and 64/62% in 2020.

Share of individual energy forms in energy delivered to consumers in %

Table 28

Energy form	1980	1995	2010		2020	
Solid fuels	20.4	22.5	17.1	16.7	13.0	12.3
Liquid fuels	44.1	38.3	36.9	35.3	39.6	38.6
Gas fuels	1.0	-	6.1	5.4	7.4	6.5
Electricity	19.7	29.2	24.9	27.7	21.8	25.7
Heat energy	14.7	9.0	13.5	13.6	16.7	15.6
Alternative forms	0.1	1.0	1.5	1.3	1.5	1.3

Share of individual energy forms/plants in energy as transformation input in %

Table 29

Energy form/plant	1980	1995	2010		2020	
Solid fuels	11.6	73.7	35.1	38.3	33.5	28.8
Crude oil	-	8.2	37.2	36.9	41.3	41.7
Hydro-power	25.2	4.5	4.8	4.6	3.9	4.7
Oil derivatives	60.5	13.6	5.3	5.7	8.0	7.5
Gas fuels	2.7	-	17.6	14.5	13.3	17.3
Total	100,0	100,0	100,0		100,0	
Refinery	-	8.2	37.2	36.9	41.3	41.7
Thermal power plants	18.2	76.8	44.0	45.7	38.7	39.0
Hydro-power plants	25.2	4.5	4.8	4.6	3.9	4.7
TE-TO	-	-	3.5	2.9	2.5	2.1
Briquettes based plant	-	-	0.3	0.2	0.2	0.2
Heating plants and boiler units	56.6	10.5	10.2	9.7	13.4	12.3

Total coal consumption by 2020 is expected to grow for 1.4 times (PGSP 1.3%) in both development options. The required coal based energy in 2010 will amount 64.048/83.357 TJ ($2.2/2.8 \times 10^6$ tEJ), and in 2020 - 82.050/83.673 TJ (around 2.8×10^6 tEJ). These balances include energy delivered to consumers (12-15%) and energy as transformation input (85%-88%). If we

deduct the energy based on imported coals (hard coal, anthracite, brown coal, coke and dry lignite) that are necessary for certain technological purposes in industry, the required coal based energy from local production is obtained, amounting $7.56/9.80 \times 10^6$ tons in 2010, and $10.10/10.42 \times 10^6$ tons in 2020.

Balance of coal from local production

Table 30

Mine	Capacity	DTV kJ/kg	2010		2020	
	10 ⁶ t		10 ⁶ t	TJ	10 ⁶ t	TJ
Low option						
Suvodol	6.00	7.651	5.48	41.913	1.98	15.138
Brod-Gneotino	2.00	8.461	-	-	2.00	16.920
Zivojno	2.30	8.179	0.76	6.233	2.30	18.810
Mariovo	2.00	7.893	-	-	2.00	15.780
Oslomej	1.10	7.314	1.10	8.045	-	-
Popovjani	1.80	4.530	-	-	1.80	8.150
Brik-Berovo	0.12	8.310	0.12	997	-	-
Zvegor-Stamer	0.11	8.214	-	-	-	-
Piskupstina	0.10	10.327	0.10	1.033	0.10	1.035
Total			7.56	58.221	10.10	75.833
High option						
Suvodol	6.00	7.651	5.48	41.913	2.10	16.138
Brod-Gneotino	2.00	8.461	1.90	16.074	2.00	16.920
Zivojno	2.30	8.179	1.10	8.997	2.30	18.810
Mariovo	2.00	7.893	-	-	2.00	15.780
Oslomej	1.10	7.314	1.10	8.045	-	-
Popovjani	1.80	4.530	-	-	1.80	8.150
Brik-Berovo	0.12	8.310	0.12	997	-	-
Zvegor-Stamer	0.11	8.214	-	-	0.12	900
Piskupstina	0.10	10.327	0.10	1.033	0.10	1.035
Total:			9.80	77.059	10.42	77.733

In the period 2000-2010, according to the low development option, activation of the mine in Zivojno to serve the demand of REK Bitola and other consumption types is necessary. The time required for this mine putting into operation is 6-7 years, which means that activities for its construction should be initiated after 2000. According to the high development option, in addition to Zivojno, the mine Brod-Gneotino should be activated in relation to the putting into operation of TPP Bitola 4.

According to both development options, opening of Mariovo mine is envisaged for the period 2010-2020, intended mainly to serve thermal power plants of REK Bitola and minor part for other purposes. The time

required for the construction of this mine is six years, which means that its construction should commence before 2015. In addition to the above, due to exhaustion of Oslomej mines (east-west) and Brik-Berovo, the mine of Popovjani should be put into operation immediately after 2010, located close to Oslomej. According to the high option, Zvegor-Stamer mine should be opened due to increased demand for coal, to serve the needs of TPP Bitola 4, Brod-Gneotino mine.

The demand for fuel wood for the whole period by 2020 note minor increase of 0.4% per year, which fits within the available annual wood volume determined for cut in the Republic of Macedonia. The energy balance envisages $770 \times 10^3 \text{ m}^3$ in 2010 and

790 h10³ m³ in 2020. The share of fuel wood in the total energy delivered to consumers is 6% in 2020, out of which 10%-11% will be consumed by industry throughout the planning period.

According to the schedule for natural gas entry in the energy system of the Republic of Macedonia, total natural gas consumption will rise to 1.168x10⁶ Nm³ under the low, and to 1.600x10⁶ Nm³ under the high development option, in 2020. In gross energy demand, this share amounts 12.3/10.5% in 2010 and 10.5/12.5% in 2020. The share of direct consumers (industry and others) is 19% in 2010 and 26.5/19.2% in 2020.

Alternative energy resources will rise their share in the total energy delivered to consumers by 2020, at annual average growth rate of 5.1%, which means that in 2020, the whole available exploration potential of geothermal power of 1.000 TJ will be utilized, as will technically feasible annual production of low heat solar energy of 1.114 TJ. Majority of this production (more than 80%) is expected to be used in agriculture (greenhouse production) in tourism and catering. Solar power will be used for energy generation, through installment of cells, panels and systems. More intensive use of solar energy is recommended in water pre-heating by solar collectors.

Consumption of liquid fuels (oil derivatives without crude oil) will reach 1.000.000 tons in 2020, under both development options, which means an increase of 2.4 times compared to 1995, with an average annual growth rate of 3.6%. Highest increase of liquid fuels is expected in transport sector (75/73% in 2020) and its share with other consumers will be 20%.

Crude oil consumption in 2020 is expected to rise to 1.000.000 tons, which is an increase for 3 times compared to 1995 (PGSP 4.5%). The share of crude oil consumption in the total energy for the power system will increase from 9% in 2010, to 11.5/10% in 2020. Most of this consumption (more than 60%) is in power generation

plants (as transformation input and operation). Crude oil consumption in industry will grow significantly and reach 280.000/340.000 tons in 2020, which is an increase of 3.0/3.6 times compared to 1995 (PGSP 4.5/5.3%).

The balance of energy demand from oil derivatives and available capacity or projected structure of the Skopje Refinery indicate that, in 2010, the Refinery would work with 55/66% of its capacity, requiring crude oil input for energy system of 6.000 tons under the low option, and for the high development option the demand for crude oil is expected to be met from domestic production. In this context, 3.968/114.700 tons of petrol and diesel fuels should be exported.

The total energy demand from liquid fuels in 2020 will amount 81.571 TJ under the low, and 89.708 TJ under the high development option. This means that in 2020, Refinery in Skopje should engage its optimal and designed capacity of 2.500.000 tons under the high, and 85% under the low development option. The existing production structure in Refinery enables production of 59.400 tons liquid gas intended for technological requirements of industry and other consumers (households), 1.017.800 tons of motor petrol and diesel fuel intended for transport (770.000 tons) and for other consumers (construction, forestry, and agriculture), 150.000 tons extra light oil for other consumers and 1.056.000 tons crude oil for consumers (390.000 tons), for transformation input (440.000 tons) and for power generation plants operation (226.000 tons). The shortage of 55.760/17.000 tons crude oil will be imported, and surplus of other liquid fuels of 52.000/161.000 tons will be exported.

Import of raw oil required for liquid fuels production in Refinery in Skopje will amount 1.375.000/1.655.000 tons in 2010 and 2.125.000/2.500.000 tons in 2020.

Total electricity consumption will increase by 2010, at an average annual growth rate of 2.3% under the low and 3.4%

under the high development option and in 2020 it will reach 10.451/13.588 GWh, which is 1.8/2.3 times more than in 1995. Its share in the total energy demand for the energy system will amount 10/11% in 2020. Biggest consumers will include industry (50/42%) and other consumers (31/41%). By this, electricity consumption per inhabitant

will rise significantly amounting to 4/5 MWh in 2020.

In the period by 2020, electricity will be provided both from local production and import. Local production will be carried out by existing and potential new hydro and thermal power plants.

Existing and potential new hydro and thermal power plants

Table 31

HYDRO-POWER PLANTS					
Hydro-power plants-HPP	Installed power	Potential electricity production	Accumulation usable volume	Plant type	
	MW	GWh/year	10 ⁶ m ³		
Existing HPP	440.5	1238.30	888.80	-	
Potential new HPP					
Kozjak	80.5	156.00	260.00	accumulation	
Cebren*	253.8	292.00	555.00	accumulation	
Boskov Most	45.0	155.45	0.86	accumulation	
Matka II	33.2	53.00	1.00	accumulation	
Gradec	54.6	252.40	43.00	accumulation	
Veles	93.0	300.60	64.00	accumulation	
Galiste*	193.5	257.00	258.00	accumulation	
Lukovo Pole	-	-	38.00	accumulation	
New small HPP	237.2	884.80	-	-	
Vardar Valley	176.8	783.70	-	-	
Total new HPP	1167.6	3134.99			
Total HPP	1608.1	4373.30			
THERMAL POWER PLANTS					
Thermal power plants-TPP	MW	GWh/year		fuel	
Existing TPP	1010	5865/6312	-	-	
Potential future TPP					
Bitola 4	225	1300/14	-	lignite	
Negotino 2	225	1300/14	-	natural gas	
TPP-TO Skopje	100	360	-	natural gas	
Total new TPP	550	2960/31	-	-	
Total TPP	1560	8825/94	-	-	

*Electricity production from HPP on Crna River will decline with the implementation of the planned irrigation systems in Pelagonia.

Under both development options, total electricity demand in 2010 will be 8.678/10.970 GWh and 10.451/13.590 GWh in 2020. This balance includes electricity delivered to consumers and losses in electricity transmission and distribution and electricity required for power plants

operation. Local production is balanced at 8.555/10.253 GWh in 2010 and 10.305/12.561 GWh in 2020. In other words, the share of local electricity production in 2010 is 98.6/93% in the total energy demand for energy system and 99.0/92.4% in 2020.

Local electricity production

Table 32

Low development option				
Electricity generation facility	2010		2020	
	MW	GW	MW	GWh
Thermal power plants	10	631	1	7.718
Hydro-power plants	63	176	9	2.146

TPP-TO Skopje	10	360	1	360
Industrial heat generation plants	68	120	6	120
Total		855		10.344
High development option				
Electricity generation facility	2010		2020	
	MW	GW	MW	GWh
Thermal power plants	1.	771	1.	9.125
Hydro-power plants	94	205	1.	2.956
TPP-TO Skopje	10	360	1	360
Industrial heat generation plants	68	120	6	120
Total				12.561

Under the low development option, electricity production by thermal power plants in 2010 does not assume introduction of new TPP, while under the high development option introduction of TPP Bitola 4 is envisaged, to operate on coal with installed power of 225 MW and average annual production of 1.300 GWh at plant threshold. Construction period of TPP Bitola 4, given the fact that part of the structures and infrastructure have already been constructed, is estimated at 2-3 years. Under both development options, construction of thermal power heat generation plant TPP-TO Skopje has been envisaged, to operate on natural gas with installed power of 100 MW and potential production of 360 GWh during winter. Construction period for this thermal power plant has been estimated at 2 years. TPP Negotino, currently operating on crude oil, is planned for connection to gas pipeline, assumed to be extended to Negotino. Due to this, it is expected to be readapted to enable it to operate both on crude oil and natural gas. This option, which is rather feasible from both technical and economic point of view, provides many advantages to the electric power system with regard to demands balance, availability of natural gas and crude oil (Refinery in Skopje) at any moment.

Under the high development option, in 2020, despite of the planned connection of TPP Negotino 2 to natural gas, Republic of Macedonia will face electricity shortage from local production and this will be compensated through import. Under the low development option, demanding much less energy, this shortage will significantly

decline by putting TPP Bitola 4 into operation.

As far as hydro-electricity production is concerned, for the period 2000-2010, apart from HPP Kozjak, significant part of available hydro-potential is planned to be developed. Under both development options, construction of HPP Boskov Most is envisaged, with installed power of 45 MW, planned annual average production of 155.5 GWh and construction period of 4 years, HPP Matka 2 with installed power 33.2 MW, annual average production of 53 GWh and construction period of 4.5 years, as well as small HPPs with total installed power of 36 MW and annual average production of 160 GWh. Under the high development option, introduction of HPP Cebren is required with installed power of 253.8 MW, planned annual average production of 292 GWh and construction period of 6.5 years. With such developed hydro-power potential, local electricity production would be ensured in this year up to the level of 98.6% under the low and 93.5% under the high development option.

In order to retain the high share of the local electricity production in the overall electricity demand for the electric power system of the Republic of Macedonia in the period 2010-2020, under the high development option, the entire hydro-potential of the country for which there has been technical and economic documentation completed, should be used. This assumes construction of HPP Gradec (54 MW; 252.4 GWh, construction period - 4 years), HPP Veles (93 MW; 300.6 GWh, construction period 7 years) and HPP Galiste (193.5 MW;

257 GWh, construction period 7 years). The low development option assumes introduction of only HPP Cebren. Both development options assume construction of small HPPs with installed capacity of 21 MW and total annual average production of 92 GWh.

Under the low development option, electricity is expected to be imported in 2010, in an amount of 123 GWh, and 107 GWh in 2020. Under the high development option, import in 2010 would amount 717 GWh, while in 2020, when significant shortage of electricity from local production is expected, 1027 GWh should be imported, which is slightly below the one produced by a TPP of 225 MW.

Consumption of heat energy is expected to rise in the coming period, at an average annual growth rate of 6.1% under the low, and 6.3% under the high development option. This will be an increase for 4.4/4.7 times in 2020 compared to 1995. The share of heat energy in the total energy delivered to consumers would amount 16% in 2020. Greatest consumer of this energy type will remain the industry with 60/69% in 2020.

Heat energy demand for part of the households and public premises are met through public heating plants. So far, public heating plants have been constructed in Skopje (510 MW) and Makedonska Kamenica (12 MW). According to the development plans of Toplifikacija* Skopje, extension of installed capacity for additional 230 MW is envisaged. Taking into account the fact that construction and putting into operation of TPP-TO Skopje with heat power of 150 MW is envisaged for 2010, the remaining capacity of 80 MW should be completed in the coming period.

Heat energy demand in industry is satisfied through its production in industrial boiler stations and heating plants. Presently, the total installed capacity of industrial boiler plants amounts 1.480 MW with potential production of 5.3 TJ/h and 569 MW in 5

industrial heating plants (Ohis, Steelworks and Refinery in Skopje, Teteks-Tetovo and Sugar Factory in Bitola) with potential production of 2.1 TJ/h, expected to be retained in the planning period and meet the demand for this energy type, through optimal utilization.

Agriculture is also heat energy producing sector in agricultural boiler stations, used for greenhouse production. The total capacity of existing agricultural boiler stations in the Republic of Macedonia is 557 MW, with potential annual production of 2.0 TJ/h, expected to cover the demand in the coming period, too.

Energy transmission and transport systems

Construction of electricity transmission and distribution facilities (power transmission lines and transformer plants) is expected to follow the overall development of electric power sector.

In order to strengthen inter-connection with neighbouring electric power systems in transmission network, apart from the development of the 400 kV line Dubrovo-Stip-Crvena Mogila, the 400 kV lines Skopje5-Nis, Skopje5-Tirana and Bitola-Lerin are also important. Connections with 110 kV lines are of local importance, and Delcevo-Blagoevgrad line has been planned for development.

By 2020, extension of electricity transmission network through power transmission lines construction is planned, with a total length of 1.230 km, out of which 242 km at the level of 400 kV and 988 km at the level of 110 kV.

In the domain of 400 kV transformer stations, apart from the initiated construction of Skopje-5, the following transformer stations are planned: Stip and Mariovo with total installed power of 1.500 MVA. In the period by 2020, construction of 19 additional transformer stations is planned, with transmission ratio 110/X kV/kV and total power of 1.200 MVA.

* Central heating company

Within the implementation of the gas pipeline, the second phase envisages construction of two branches (Sveti Nikole-Veles-Negotino and Tetovo-Jegunovce-Gostivar), with a possibility for this system connection with Serbia and Kosovo and use of the existing gas pipeline, through which Republic of Macedonia, i.e. Skopje Steelworks, was supplied with TH gas from Kosovo by 1990. Regional gas pipeline is planned as well, to connect southern parts of the Republic of Macedonia and through Strumica, Kavadarci, Prilep and Struga connection will be made with neighbouring Albania, and through Adriatic Sea with Italia. One branch of this system, through Demir Hisar and Bitola, will continue to Greece, and additional connection is envisaged with Bulgaria.

Balkan oil pipeline Burgas-Duras is also planned for the coming period, which on the territory of the Republic of Macedonia will pass through Kriva Palanka, Kumanovo, Skopje, Veles, Prilep, Bitola, Resen, Ohrid and Struga, as well as product line from the Refinery in Skopje to Kosovo.

3. PROJECTION OF THE POPULATION AND ORGANIZATION OF SETTLEMENTS AND ACTIVITIES

3.1. DEMOGRAPHIC GROWTH

Current status

According to the official data of the 2002 Census, Republic of Macedonia has 2 022 547 inhabitants in 564 296 households, with an annual average growth of 9 577 inhabitants in the period 1994 – 2002, or average annual growth rate of 0.6%.

In long term, the intensity of population growth has decreased significantly at national level, compared to demographic trends in former decades, when the average annual growth rate was around 1.6%. This indicates calmer demographic growth in the country, especially during the last decade.

In terms of regional distribution, demographic trends manifest different intensity and directions.

Regional differences exist, followed by a trend of their deepening, which has reflected on the changed share of individual municipalities in the total population of the country.

The above tendency of the total population growth in the country, as well as growth in specific regions, are caused by changes in the components of natural movement of the population, on one side, and mechanical movement of the population, on the other.

Natural population growth in the Republic of Macedonia notes an average annual growth of 22.630 people.

Population natural growth rate had been noting a permanent decrease in the period 1948 (26.3‰) to 2002 (4.8‰). This is due mainly to the decrease in birthrate from 40.7‰ in 1948 at 20.6‰ in 1981 and at 13.6‰ in 2002. However, the natural growth rate remains high in certain municipalities of the Republic of Macedonia, (15.8‰ in Lipkovo and 18.7‰ in Zelino). Compared to them, municipalities of moderate and low natural population growth have been characterized with a tendency of permanent decrease in birthrates, followed by parallel increase of mortality rates, due to family planning and changes in age structure.

As far as mechanical migrations are concerned and their impact on the total population growth, the process of spatial mobility of the population in the Republic of Macedonia was very intensive in 1960s and 1970s, especially through movements from villages to cities. These types of migrations affect, at lower or higher intensity, all municipalities in the country, especially underdeveloped municipalities and hill-mountainous areas. Thus, around 300.000 people left the villages in the period 1961-1981. After 1981, abandonment of villages continued, but at lower intensity, as some of the rural settlements have been deserted already.

Goals

- Stimulation of population growth in circumstances of low birthrates and decrease of losses due to mortality and emigration;
- Prevention of fertility decrease with the population failing to achieve stable reproduction rate, as well as decrease in population growth in case of wide reproduction;
- Reduction of mortality through birthrate, especially with infants and extension in life expectancy;
- Improvement of population structure and territorial distribution;
- Efficient guidance of internal and external migrations and achievement of optimal relation between demographic and economic development;
- Increase in the level of economic activity of working able population;
- Provision of conditions for balanced distribution of the population in the country;
- Overall revitalization of the most threatened areas from demographic point of view and strategically most important areas (hill-mountainous and border areas);
- Permanent improvements of structural and other features of the population;
- Provision of conditions for positive effects of urbanization process expansion to all parts of the country;
- Slowing down the growth of urban population, with tendency of growth in smaller scale towns and other settlements, for the purpose of developing the concept of poly-centered development;
- Restoration of rural settlements in all parts of the country possessing realistic needs and possibilities for that, including real improvement of living standard and quality.

Population projection

Population is one of the basic elements upon which projection of future organization is based. It is the most relevant factor of the future development of the country and its society. Determination of the concept of spatial organization, development, use and protection of the national territory depends

on the growth, structural changes and spatial distribution of the population.

Taking as starting point the determinant that population policy, through system of measures and activities, should influence the natural growth, it has been assessed that the provision of planned development and exit from the status of underdevelopment requires active population policy managed in accordance with the possibilities of the social and economic development level of the country. Within these frames, unique population policy should be implemented through differentiated approach and area specific measures, for the purpose of achieving optimal utilization of space and resources, human conditions for family and social living of the population, decrease in migrations, as well as establishment of conditions for more balanced regional development of the country.

First of all, the population should accept the necessity of changing the reproduction behaviour and establishment of new norms in their biological attitudes, as a precondition for achieving significant effects in the coming period. Adjustment of natural population growth to the economic development of the country will lead to further positive changes in the family and improved position of children and women.

In order to achieve rationale reproduction of the population at national level, the measures of population policy should be complex and region specific, integrated in development documents and comply with regional differences in demographic, economic and social terms.

Based on the stated premises, the total population of Macedonia projected for 2020 is 2.225.000 inhabitants (projection made through computer programme created by the Agency POPTECH – The Future group International, Wash. USA 1991.), representing average annual growth of 0.5% compared to 2002.

In the framework of general population trends, it has been assessed that the share of older population will rise. Population aged

between 0-14 is expected to decrease its share in the total population from 24.8% at 19.9%. We may expect major changes, i.e. higher share of the population aged 15-64 (from 66.7% at 67.0% in 2020).

Major changes are not expected in gender structure of the population in the coming period, so the ratio between male and female population will be retained as is.

Assumed changes in social, economic and educational structure of the population will be reflected in the living style of the population, and consequently on the structure and size of households.

In this context, total of 646.283 households in the country with an average size of 3,4 members per households has been envisaged for 2020.

3.2. URBANIZATION AND NETWORK OF SETTLEMENTS

Current status

Urbanization is a complex, dominant process within spatial and overall social and economic development of the country. The outstanding dynamics in the former period, expressed through intensive demographic, functional and spatial-physical development of urban settlements and depressed development of rural areas, is the main attribute of urbanization. Continuous deepening of existing differences and notably unfavorable social and economic status of majority of the rural population, initiated continuous process of dynamic migration and spatial re-distribution, directed mainly towards urban centres, thus resulting in depopulation of high number of rural settlements.

The process of intensive development resulting from planned concentration of social functions and economic facilities in urban centres, is the main reason for the intensive increase in urban population, and thus reaching high level of 59.7% urbanization.

Among the total 1.795 registered populated places, 29 settlements (1.6%) form the category of urban, and 1.766 settlements (98.4%) rural settlements. Municipal centres

will have an important role in the future spatial development of the country. Development of urban settlements in the former period was accompanied by significant expansion of the influence zone over areas in suburban zones, where coverage scope and intensity of influence corresponds with population size and functional status of the city. Today, big and medium scale cities in the country obviously have largest influence zones and appropriate number of settlements in the close vicinity of gravitational coverage.

Goals

- Establishment of conditions for uninterrupted performance of people's activities (functions), provision of high level of environmental protection and application of the principles of sustainable development;

- Decentralized, balanced territorial distribution of development, through introduction of the principles of balanced territorially distributed poly-centricity and hierarchy;

- Harmonization of the dynamics of the process of spatial distribution of the population with the dynamics of economic development;

- Reduced intensity of population concentration in urban settlements and higher level of harmonization with the dynamics of economic development of the country;

- Increased level of functions and activities in the domain of public functions, services and infrastructure availability in municipal centres;

- Changes in the structure of rural population employment, through further increase of employment in non-agricultural activities, in parallel with the functional and infrastructural equipment of rural settlements;

- Stimulation of the development of underdeveloped and depopulated areas;

- Balanced and equalized development of populated places;

- Optimal functional equipment in line with future needs of users;

- Efficient mutual inter-connection of the population on macro-level and in different spatial segments;

- Establishment of more favorable conditions for urban settlements development, especially those cities that will contribute for higher equalization of effects from the process of urbanization and balanced dispersion of the space in the country;

- Intensification of development of cities that will have the role of moderating the high rate of population and functional polarization within the spatial scope of the national centre;

- Development and equipment of urban settlements in accordance with the projections concerning their position and role in the system of central settlements;

- Development of urban settlements that may have direct stimulative influence on economic and demographic growth of border and underdeveloped areas;

- Intensification of the development of settlements in suburban zones based on qualitatively new grounds, connected directly and efficiently with urban settlement;

- Efficient and rationale mutual communication linkage of the system of centres, especially between neighbouring cities and regional centres;

- Strengthening of functional relations between neighbouring urban centres in the domain of economy and services, through coordinated, joint organization of activities.

Planning determinants

Urbanization as a complex, dynamic process should have the role of basic framework and driving factor in terms of directing the long-term spatial development of the Republic of Macedonia. Significant projected changes in demographic, functional and spatial-physical components should result from the decentralized, comprehensive and highly balanced spatial development allocation, implemented mostly within poly-centric, hierarchically balanced system of populated places.

In the coming period, the process of urbanization will be carried out under social and economic conditions in which market initiative and market economy will hold important position and guiding role in the definition of perspective long-term development. The strategy for the urbanization process development as basic framework for future organization, development and use of the national space, is adjusted and harmonized with the experienced deep changes and future long-term requirements of the social and economic system. Development concept of urbanization is based on the following assumptions:

- Migration processes in the country will remain in the coming period, but with significantly lower intensity and higher level of harmonization with the dynamics of economic development;

- Urban centres with qualitatively and quantitatively improved functional and infrastructural potential will remain key carriers of positive changes in the process of urbanization in the country in the coming period;

- Strengthened development of small scale urban settlements and other municipal centres should increase their effects in terms of settlements network in the municipalities development harmonization and equalization;

- Polarization of the population in urban centres in future will continue with lower intensity, accompanied with intensification of daily migrations of employees and service users to urban settlements and municipal centres;

- Development of the national centre – urban agglomeration of Skopje – will be characterized with lower intensity, establishment of organized and equipped system of suburban settlements, efficiently connected with the city in terms of communications;

- Urban centres, with few exceptions, should finalize and stabilize functional and demographic structure in parallel with the

strengthening of mutual relations and relations on other levels;

- Development of settlements in the close vicinity of macro-regional and meso-regional centres, influenced thereby, should be carried out at higher intensity and disagrarization;

- Development planning for the settlements surrounding urban centres will be treated in parallel and integrally with the development of urban settlements;

- Planned development of settlements surrounding urban centres will reduce and eliminate tendencies of spatial-physical expansion and establishment of zones of population of areas along communication sections;

- Demographic and spatial-physical development of urban settlements will be carried out in a planned manner and in parallel with the process of functional completion. Planning of the development of urban centres should also include settlements in suburban zones, with their overall potential and in an integrated manner;

- Development of communication, and especially transportation infrastructure will support the system of populated places. Efficient transportation connection of urban centres at equal or different hierarchical level will be one of the priority tasks of the development of the national communication network. Development of transportation infrastructure will enable, on complementary basis, strengthened functional (and spatial) connection between adjacent, close urban centres (Ohrid-Struga, Kocani-Vinica, Kavadarci-Negotino, Strumica-Valandovo, Berovo-Pehcevo);

- Urban centres located in boarder areas (Gevgelia, Berovo, Delcevo, Debar, Struga) or in the vicinity of border zone (Bitola, Kumanovo, Strumica, Tetovo, Ohrid, Kriva Palanka), are expected to achieve significant development through direct connection with the cities and economies of neighbouring countries;

- Development of rural settlements in border and hill-mountainous areas should be

carried out under direct influence of closest urban centres, with which they will be directly connected in terms of transportation, thus enabling higher level of natural advantages utilization.

Spatial concept of the network of centres

The concept of the spatial development of the Republic of Macedonia, founded on the principles and development goals of urbanization, defines directly the structure and the main features of the network of central settlements. In accordance with the above, the pre-established hierarchical structure and position in the space, the contents of functions and activities, directions and extent of mutual connection in the network of centralized settlements, has been defined.

The network of central settlements on the territory of the Republic of Macedonia is expected to include the following levels:

- Centre of the country – centre at national level of international influence;

- Centre of macro-region – centre at macro-regional – above regional level;

- Centre of meso-region – centre at middle – regional level;

- Centre of micro-region – centre at subregional level.

In the planning period, the development of the network of urban centres in the Republic of Macedonia will be oriented towards clearer distinction of the position of each settlement in the framework of defined level of centrality, in line with the population scale, position in the space and gravitation coverage. The planning concept envisages clear distinction of the content of functions and activities, fully adjusted to the level of centrality and gravitational coverage of urban centres:

- Centre of the country – national centre(1)- the City of Skopje: population scale above 490.000 inhabitants (2020); full contents of public functions and service activities at highest level; high level of concentration of production economic facilities; zone of direct gravitational

influence on the space of the country with more than 2.220.000 inhabitants and areas in the close international surrounding.

– Centres of macro-regions (3+1) – urban settlements: Bitola, Stip and Tetovo, population scale over 45.000 inhabitants; high level of availability of public functions, social standard and services at macro-regional, and higher level for certain functions; significant concentration of production economic facilities; the zone of gravitational influence covers between 300.000 inhabitants (Tetovo), 350.000 inhabitants (Stip), 500.000 inhabitants (Bitola); remained population of more than 1.000.000 inhabitants is expected to gravitate to the capital of Skopje, that will play double role in the system of settlements – national centre and centre of macro-region.

– Centres of meso-regions (9) – urban settlements: Kumanovo, Prilep, Veles, Ohrid, Strumica, Gostivar, Kavadarci, Kicevo, Kocani; population scale - 30.000 inhabitants or more; significant availability of central functions of public nature, functions of social standard, and services at regional level; high concentration of production economic facilities; seven or more municipalities covered by gravitational influence.

– Centres of micro-regions (21) – urban settlements: Struga, Gevgelia, Radovis, Debar, S. Nikole, Negotino, Delcevo, Kriva Palanka, Vinica, Probistip, Resen, Berovo, Kratovo, Krusevo, Valandovo, Pehcevo; population scale bellow 30.000 inhabitants; availability of public functions, functions of social standard and services; presence of production economic facilities; gravitational influence over two municipalities at minimum. This category of central settlements will be supplemented by settlements that will be transformed into small urban settlements by 2020, thus joining the category of urban settlements: Makedonska Kamenica, Demir Kapija, Makedonski Brod, Bogdanci, Demir Hisar.

Economic and functional development of central settlements, located next to or by

areas of special importance to the country (areas possessing special natural, cultural, historical, tourist and recreation values and border and hill-mountainous depopulated areas), will be stimulated in order to create optimal conditions for suitable dynamics of economic and demographic development.

The model of central settlements development will have the following features:

– Large and medium scale urban settlements, in circumstances of moderate population growth, strengthened and qualitatively improved functional structure, are expected to increase the influence over surrounding areas and settlements, implying the need for integrated planning of the wider area.

– The national centre, under conditions of stable demographic growth, is expected to strengthen its connections with the surrounding regional centres: Kumanovo, Tetovo, Veles, through strengthened functional relations based on the principle of complementarity and efficient communication linkage.

– The process of more intensive two-way functional connection (in the domains of services, economy and employment) should be present in other urban settlements, as well: Ohrid-Struga, Kavadarci-Negotino, Berovo-Pehcevo, Gevgelia-Bogdanci.

– The development of urban settlement with up to 10.000 inhabitants, especially settlements up to 5.000 inhabitants and underdeveloped municipal centres will be fostered through plan guided spatial-physical and functional development, in order to achieve balanced and harmonized development of the network of settlements.

– Favorable geo-transportation position, especially position of the main communication sections, will be encouragement factor for urban settlements development in border areas with neighbouring countries - Greece (Bitola, Gevgelia), Bulgaria (Delcevo, Berovo, Kriva Palanka, Pehcevo), Albania (Ohrid, Struga, Debar), Yugoslavia (Kumanovo).

– Spatial-physical development of urban settlements and settlements in their adjacent surrounding in the coming period should be treated in an integrated manner and plan guided, in order to reduce and limit the uncontrolled intensive process of population of the outskirts of urban settlements manifested in the past.

– The process of developed land zone expansion in urban settlements is expected to slow down, and prospective spatial-physical development to be oriented towards more efficient utilization of building land within current boundaries, in accordance with applicable standards and norms.

Spatial functional units

Organization of the national territory into spatial functional units is intended to achieve:

– Rationale organization and optimum harmonization of public functions with the needs and the interests of the local self-government;

– Rationalization of the governance process;

– Efficient fulfillment of everyday needs of the population;

– Efficient planning and implementation of activities, harmonization and coordination of programmes at local level.

The main effects of spatial functional units expected in the coming period concern:

– Clear and precise identification of development needs at primary – local level;

– Increased level of integration in the functioning of (sub)system of populated places, more efficient dispersion of the complex of public functions and activities (economy, governance, services, housing, recreation) and optimal development of infrastructural systems;

In the coming period, through achievement of appropriate effects, clear and precise development performance, enhanced level of integration, other populated places are expected to enter in the system of populated places and optimal and efficient

fitting into systems on higher macro-regional level.

In the framework of the concept of spatial functional differentiation, 15 functional units have been identified on the territory of the country, with equal number of functional centres. The centres of spatial functional units are settlements of different level of centrality and number of inhabitants within their range.

Spatial functional units - 2020

Table 33

No.	Spatial functional unit	Inhabitants	% of total
1.	SKOPJE: Centar, Karpos, G. Baba, K. Voda, Cair, Gj. Petrov, Saraj, Cucer-Sandev, Aracinovo, Ilinden, Petrovec, Studenicani, Zelenikovo, S. Orizari, Sopiste, Kondovo	614.400	27.6
2..	BITOLA: Bitola, Resen, D. Hisar, Sopotnica, Dobrusevo, Staravina, Bac, Kukurecani, Capari, Mogila, Novaci, Bistrica	155.300	7.0
3.	VELES: Veles, Gradsko, Izvor, Bogomila, Ca {ka	76.200	3.4
4.	GEVGELIJA: Gevgelia, Bogdanci, Valandovo, Star Dojran, Miravci	54.300	2.4
5.	GOSTIVAR: Gostivar, Mavrovi Anovi, Srbinovo, Vrutok, Dolna Banjica, Cegrane, Vrapciste, Negotino Polog	113.800	5.1
6.	KAVADARCI: Kavadarci, Negotino, Demir Kapija, Rosoman, Konopiste	73.200	3.3
7.	KICEVO: Kicevo, M. Brod, Plasnica, Samokov, Oslomej, Drugovo, Zajas, Vranestica	93.400	4.2
8.	KOCANI: Kocani, Delcevo, Vinica, Makedonska Kamenica, Zrnovci, Blatec, Orizari, Oblesevo, Cesinovo	97.900	4.4
9.	KUMANOVO: Kumanovo, Kriva Palanka, Kratovo, Orasac, Lipkovo, S. Nagoricane, Klecevice, Rankovce	186.900	8.5
10.	OHRID: Ohrid, Struga, Kosel, Belcista, Meseista, Delogozdi, Velesta, Vevcani, Labunista, Lukovo	174.300	7.8
11.	PRILEP: Prilep, Krusevo, Vitoliste, Topolcani, Dolneni, Krivogastani, Zitose	119.200	5.4
12.	STRUMICA: Strumica, Berovo, Pehcevo, Novo Selo, Murtino, Bosilovo, Kuklis, Vasilevo; Radovis, Podares, Konce	144.600	6.5
13.	TETOVO: Tetovo, Bogovinje, Kamenjane, Brvenica, Zelino, Sipkovic, Dzepeviste, Jegunovce, Tearce, Vratnica	203.000	9.1
14.	STIP: Stip, S. Nikole, Probistip, Zletovo, Karbinci, Lozovo	116.650	5.2
15.	DEBAR: Debar, Rostuse, Centar Zupa	18.870	0.8

3.3. RURAL SETTLEMENTS AND AREAS DEVELOPMENT

Current status

The development of rural settlements and rural areas has been so far carried out under conditions of dominant influence of urban centres and processes of agricultural activities and rural areas abandonment. Determined by general frameworks of urbanization and industrialization, development of rural areas has been noting permanent variations in the number and structure of rural population, expressed through reduction in the total rural population and number of agricultural population. Unfavorable processes recorded mainly in the category of hilly and mountainous and border areas settlements, as well as in a part of plane areas (Pelagonia) have been manifested through: reduction of the number of settlements with permanent population; increase of the number of small settlements up to 100 inhabitants; reduction of the number of rural and agricultural population; increased vitality of settlements with more than 2000 inhabitants.

Goals

- Intensification of positive forms of transformation and socio-economic development of rural areas, through optimal utilization of resources and increased dynamics of economic development, in line with modern principles of market economy;
- Increased level of economic and social security, with direct impact on increased motivation of the rural population and demonstration of durable interest in living in the native environment, full affirmation of all aspects of living and working in rural environment and establishment of the required level of economic and social security;
- Increased level of functional and infrastructural equipment and planned development of rural settlements, enhancement of the local transport infrastructure, and efficient connection with higher level centres, in terms of communication;

– Preservation and promotion of natural values and environmental properties of the space and promotion of cultural values.

Planning determinants

Integrated and multi-functional approach represent the starting point in the concept designing, towards quality of living improvement in rural areas. Based on detailed and precise analysis of the state, priority has been given to the full mobilization of available resources to be used in the establishment of a system of efficient organized market based economic activity.

By selective application of incentive measures, the leading role of development will be played by rural households that are economically and organizationally prepared for further promotion and increase of production and quality improvement of living conditions in rural environment.

Rural areas and settlements development in the coming period will be managed on the basis of the programme to derive from the results of the completed inter-disciplinary scientific, research and development project.

The concept of development, supporting prospective and qualitative transformation of villages, requires comprehensive, socially coordinated activity aimed at: full institutional and organizational integration, transportation and communication connection of rural settlements with the networks of populated places and direct linkage with public institutions and business entities in order to stimulate and improve the production, the complex of tertiary activities, the quality of living in rural settlements, and to increase the level of employment of the rural population.

Priority task will be full mobilization of economic development relevant resources, improvement of living and working conditions and durable motivation of the population to continue to live in native environments. This task will be implemented through market conditions establishment, led by rural households capable to provide sufficient accumulation for reproduction and

enhanced production activities and to improve living conditions in rural environments.

The role of the state will be to apply selective and stimulating approach, aimed at:

– Initiation of positive changes in village and agricultural production valuation, as professional determination and source of earnings;

– Establishment of conditions of restoration and affirmation of rural living styles, through infrastructural equipment of rural settlements and efficient transportation and communication connection;

– Increased efficiency of public services and enabling direct, easy affordable access to a broad spectrum of facilities of social standard and public utilities;

– Provision of appropriate technical assistance and incentive fiscal, crediting and investment policy that will take into account specific requirements of agricultural sector and related activities.

3.4. HOUSING

Current status

According to official data, the total number of dwellings in the Republic of Macedonia is 580.342, (according to the latest unofficial data- 690.762), which compared to the number of households - 501.963 (557.254), indicates a housing surplus of 78.379 dwellings, resulting from the intensive housing building in the period before 1971, abandonment of part of the housing stock in rural settlements (especially mountainous) and building of new dwellings in urban settlements and appearance of dwellings for secondary housing.

The average surface area of apartments is 70.71 m², the average housing area per inhabitant is 21.09 m², and the average number of inhabitants per dwelling is 3.35.

Most of the dwellings (93.77%) are inhabited by one household. High percentage of dwellings (27.18%) was built in the period 1971-1980, and after (30.02%). 87% of the total housing stock has been built by

application of construction standards for buildings in earthquake prone areas.

The overall housing stock is dominated by large apartments (25.1% four-bedrooms and 29.60% three-bedrooms apartments), and the share of small apartments is low (3.11% one bedroom and 0.56% one room apartments). Most of the apartments (90.65%) are in buildings of solid material. 87.98% of the total number of apartments are connected to water supply, sewerage and electricity.

Around 11.9% of the total housing stock is substandard.

The phenomenon of illegal building has been rising in the past years, noted both in the area of housing and industrial, commercial and other buildings.

Goals

- Provision of dwelling for each family;
- Increased level of housing standard with regard to surface area, number of rooms, construction properties and utilities availability in dwellings;
 - Aseismic building of dwellings;
 - Substitution of substandard housing stock by new and reconstruction and revitalization of dilapidated one;
 - Dwellings organization as humanly arranged areas with appropriate accompanying facilities for children and adults;
 - Acceleration of housing construction through better organized, more efficient and rationale construction;
 - Liberalization of housing market;
 - Construction of dwellings intended for low-income population;
 - Provision of favorable financial conditions for housing issues settlements, through favorable crediting conditions for dwellings construction;
 - Definition of criteria for settling the issue of illegal building;

- Changes in the policy of housing development, in line with the changes in political and economic systems, i.e. abandonment of social building, renting as new trend in housing policy, new way of housing development valuation and investment therein, location evaluation and synchronizing housing with land policy, industry, tourism and communications.

Planning determinants

The concept of future housing development is intended to overcome the present polarization of urban development, that has resulted in huge urban centres creation (big cities) which have become focal points of economic development and population concentration, thus increasing their housing, infrastructure and other demands, on one side, and rural settlements gradually abandoned by the population attracted by the power of big cities. In this context, the concept of poly-centric development has been applied, treating the housing as specific development resource, which is of particular relevance for underdeveloped areas as new focuses of development. Spatial allocation of new economic facilities is based on the existing housing stock in minor settlements, where technology, and not labour, becomes the most mobile element. In this way, the existing housing stock, as one of the initial development resources, enables strengthening of existing and establishment of new development centres, towards poly-centric development implementation.

Projections of required housing area is based on the standards 20-25 m²/inhabitant, depending on the type of settlement, 40-80 m²/dwelling (optimal size), 100% dwelling equipment with installations (especially in urban settlements) and full elimination of substandard housing stock, through substitution.

Projection of housing demand at national level

Table 34

Number of inhabitants in 2020	2.225.000
Number of households in 2020	646.283
Existing dwellings	580.342
Existing dwellings to remain	511.282
New dwellings on the basis of substitution of substandard dwellings	69.060
New dwellings on the basis of population growth	144.320
New dwellings on the basis of annulled housing deficit	414
Total dwellings for construction	213.794
Total dwellings in 2020	725.076

Total housing demand by 2020 have been estimated at around 213.800 dwellings, to be implemented in phases. Demand for new dwellings is highest in municipalities of the City of Skopje (23.82% of the total dwelling demands), followed by Bitola, Kumanovo, Prilep, Ohrid, Veles, Tetovo, etc. Lowest level of housing demand is present in the newly established municipalities Staravina, Zitose, Srbino, Izvor, etc.

New dwellings will be fully equipped with installations. Full substitution, i.e. elimination of substandard housing has been projected, too.

In order to achieve the projected housing demands in the country, the average dwelling surface area will amount 16.355.700 m².

Functional demands of households, in terms of living, education, training, culture, etc., have led to transformation of the traditional housing types and expansion of its basic function – to satisfy existential needs of the households, through introduction of new values and identification of new possibilities for proper area use and organization.

The structure and the physical model of a housing unit is in correlation with the social organization of people living therein.

Organization of housing communities is a positive factors for cultural, economic and social activities of their inhabitants. This relationship is also manifested through feedback of public functions on housing, as their efficient performance determines the size and the number of housing communities.

Housing in general, and dwellings building in particular, is an important component of social and overall economic

development, space organization and development and increase of the living standard of the population.

Well balanced relationship between economic and social development of the community determine adequate directions of urbanization and positive settlement of housing issues.

In the above context, housing is a complex issue, consisting of three dimensions:

- Technical dimension (surface area, yard, micro-climate conditions);
- Social dimension (living style in and outside dwelling, social contacts among individuals and families, etc.);
- Economic dimension (buying ability, manner of family sustainance, etc.).

3.5. PUBLIC FUNCTIONS

Current status

The manner of public functions organization has been so far characterized by their inadequate adaptation to the type of settlement, position in the system of settlements, status of transport connection and socio-economic and demographic characteristics of the population, resulting from the past single model of these activities organization and financing, as well as from the lack of organized cooperation between local communities and public activities towards establishment of programmes for their activities organization.

Possibilities for meeting the demands of the citizens in the domain of public functions and the quality of delivered services are rather unequal in the wider region of Skopje and major cities with well developed and

high quality network of public functions, compared to rural and suburban settlements with only elementary network in place. Building quality and buildings equipment differ greatly depending on the type of the settlement.

Despite of the fact that the level of education is satisfactory (1033 primary schools, 89 public and 3 private secondary schools and 31 faculties at the two national universities and 10 faculties and 4 advanced schools at the two private universities), this sector faces substantial problems related to inadequate distribution of the relevant facilities on the territory, high concentration in developed centres, especially in the capital, insufficient equipment of buildings with the required properties, facilities and sporting grounds, etc.

Significant results have been achieved in the health care sector, in terms of solid material base establishment. The network of health care organizations in the public sector of the Republic of Macedonia includes total of 144 health care organizations distributed at primary, secondary and tertiary levels. During the past several years, staffing has been improved, through qualification structure enhancement and procurement and installation of modern medical equipment in all health care organizations.

The activity of social welfare in Macedonia is carried out through social welfare organizations and 299 organizations for pre-school children accommodation and training.

Culture, as complex activity, is carried out through 200 different organizations (32 libraries, 10 cinema houses and film libraries, 8 institutions in the field of scenography and music activity, 12 theatres, 59 culture houses, 5 workers' training centres, 42 institutes for monuments of culture conservation with 36 museums, 3 art galleries with 6 organizational units, 16 museums with 55 organizational units and 4 annual culture and arts manifestations).

Physical culture (sports) development in the Republic of Macedonia has been

characterized by constant extension of material base, i.e. development of sports facilities and grounds, as well as facilities for physical training in educational and training institutions (166 sports halls, out of which 138 in schools; 20 outdoors olympic swimming pools, 11 indoors swimming pools, 35 football stadiums, 292 football play grounds, 1.018 outdoors handball, volleyball, basketball and soccer play grounds, 32 tennis courts, 5 athletics tracks, etc.). There are also 15 climbers' homes, 1 hippodrome, 21 archery terrains, 3 bowling alleys and 3 sports airports in the Republic of Macedonia.

Scientific and research activities in the country are carried out through 14 independent scientific and research organizations, scientific units within Science Academy and 15 research and development units within economic enterprises and non-economic organizations.

Goals

- Decrease in living conditions differences among different settlement types;
- Mobilization of local communities and citizens' self-initiatives through different institutional and non-institutional arrangements;
- Increased utilization of built stock to meet the demands of different public functions performance;
- Accelerated development of the network of institutions for pre-school training and education, related to their importance for the psychological and physical growth of young individuals, by including as many users as possible;
- Development of better balanced network of primary and secondary schools, with full coverage of children and young people of appropriate age and teaching in one shift;
- Better balanced development of health care and improved quality of service delivery, through health care services spatial organization and staffing improvement;
- Further accelerated development of culture, through higher level forms of

cultural living, with an accent on rural areas and centres of newly established municipalities;

- Expansion of the network of facilities and capacity in the area of physical culture, in order to achieve its better balance and spatial distribution.

Planning determinants

The approach in the analyses of the planning concept of public functions organization has been adjusted to the changes in political and institutional system of the country, as well as to new trends and practices of these activities organization and financing in developed countries, with stressed dimension of social development.

The planned balanced development of economy and system of settlements in the Republic of Macedonia is a precondition to the balanced development of public functions, as a need for richer choice of professions, need for appropriate education, increasingly diverse needs in the field of culture and development of modern health care and social welfare of the population, through developed network of institutions in this area.

Organization of public functions in certain areas and their integration into the projected network of settlements is based on the following principles:

- Introduction of appropriate indicators of service availability for citizens in the projected network of public functions, such as: transport availability, information availability with possibilities for daily contacts at greater distances, development of complementary properties in individual activities (homes, boardinghouses, dispensaries, kitchens, etc.), working hours of individual public functions adjusted to the needs of the citizens, development of tertiary mobile services (mobile libraries, mobile health care services, etc.);

- Possibility for re-distribution and adjusted development of certain functions in the areas of education, health, culture and other to cover two or more spatial functional units;

- Application of different criteria in public activities organization: demographic, socio-economic characteristics, size of gravitation area, transportation position and connection, culture development level and potentials, extent of interest with investors and programmes justifiability in terms of investments, etc.;

- Establishment of minimum binding standards and norms for individual public activities, in order to provide binding, minimum conditions for demand meeting;

- Elaboration of specific programmes in line with the specific features of the area, local communities and territorial groups in villages.

The network of public functions in the Republic of Macedonia is organized in accordance with the system of settlements. Recommendations for public functions organization within the system of settlements are presented in the table bellow, in which individual types of activities in the frames of public functions are defined, in relation to hierarchical level of settlements.

Organization of public functions by hierarchical network of settlements

Table 35

	Public functions	State centre	Macro-regional centre	Meso-regional centre	Municipal centre (micro-regional)	Other municipal centres	Other settlements	Radius of gravitation	Comments
	1	2	3	4	5	6	7	8	9
I.	<i>Social protection and pre-school education and training</i>								
A.	Social protection								
	1. Homes accommodating children without parental guardianship	N ⁰	N ⁰	N ⁰	N* ⁰				
	2. Homes for functionally and mentally disabled persons	N ⁰	N ⁰	N ⁰	N* ⁰				
	3. Centres for the aged	N ⁰	N ⁰	N ⁰	N* ⁰	N* ⁰			
B.	Pre-school education	N	N	N	N	N	N	600 - 1.000m.	Covers around 6% of the number of population, adjusted to local and socio-economic circumstances
II.	<i>Education</i>								
	1. Primary education I - IV grade +	N	N	N	N	N	NN	1.500 m.	
	2. Primary education V - VIII grade +	N	N	N	N	N	NN	2.500 m.	Regional primary school is organized per 2000-3000 population. Central primary school per 3000-10.000 population. Obligation for organized transport (school bus or public transportation) for destinations over 2.500 m.
	3. Secondary education +	NK	NK	N ⁰ K	N ⁰ K*	N*K* ⁰			
	4. Advanced and higher education	NK	NK	N* ⁰ K* ⁰	N* ⁰ K ⁰				
	5. Pupils' and students' dormitories	N	N	N	N*				For pupils and students educated outside their living place if 50%, location to be close to the school or faculty.
III.	<i>Health care</i>								
A.	Primary health care								
	1. Health stations mobile health service +					N	N		Gravitation area up to 1.000 population (rural zones)
	2. Health care centres				N	NN	NN		Up to 10.000 population, depending on population density
	3. Medical centre	N	N	N	N	N*			
	4. Non-hospital dispensary	N	N	N	N*				
	5. Pharmacies +	N	N	N	N	N	N*		
	6. Regional Office of Public Health Institute				N	N*			
B.	Secondary health care								
	1. General hospitals	N	N	N	N				

	Public functions	State centre	Macro-regional centre	Meso-regional centre	Municipal centre (micro-regional)	Other municipal centres	Other settlements	Radius of gravitation	Comments
	2. Specialized hospitals	N	N	N*	N* ⁰				
	3. Rehabilitation centres		N* ⁰	N* ⁰	N* ⁰	N* ⁰			
	4. Public health institutes		N	N	N				
V.	Tertiary health care								
	1. Clinics	N	N						
	2. Institutes	N							
	3. Health rehabilitation institutes	N							
	4. State Public Health Institute	N							
IV.	Culture								
	1. Libraries	N	N	N	N	N	N		Institution of national importance at the level of country centre, with possibilities in other centres as well
	2. Museums	N	N	N	N*	N*	N*		
	3. Archives	N	N	N	N*				
	4. Art galleries and exhibition facilities	N	N	N	N*	N*	N*		
	5. Scenography and music activities	N	N	N	N*	N*	N*		
	6. Institutes for monuments of culture conservation	N	N	N	N*				
	7. Culture Houses	N	N	N	N	N	N*		
	8. Children's and youth homes	N	N	N	N	N*			
	9. People's university	N	N	N	N*	N*			
V.	Information technology and communications	N	N	N	N	N	N*		
VI.	Physical culture (sports)								
	1. Outdoor, developed areas suitable for different types of sport activities, with minimum investment requirements	N	N	N	N	N	N		
	2. Outdoor, developed areas suitable for different types of sport activities, with equipped utilities, regimes of use, etc.	N	N	N	N	N	N		
	3. Indoor facilities for physical culture, with certain utilities and other accompanying premises (swimming pools, tennis courts, exercising and gymnastics halls)	N	N	N	N	N*	N*		
	4. Small scale sports and recreation centres of multi-purpose character	N*	N*	N	N*	N*	N*		
	5. Sports and recreation centres to meet the standards for regional and international competition	N*	N	N*	N*				
	6. Sports and recreation centres to meet the standards for international competition	N	N	N*					

Legend of signs:
N - necessary
NN – if impossible to organize in the settlement
* - Recommendable, if there is proper interest and economic possibility for organization
(in public or private sector)

K – necessary organization of complementary accompanying properties
(pupils' and students' dormitories, etc.)
+ - the lowest level of required organization of the property specified

⁰ – In central settlement or in other settlement within the area of the territorial entirety

3.6. INDUSTRY

Current status

Development and spatial distribution of industry is a key factor and driving force in overall economic development fostering and modernization of other areas of economic and social living. However, the problems encountered in the development of this sector cause disproportion both in the overall economy and other segments of economy: unemployment, decrease in gross domestic product, deficit in trade balance, reduction in personal consumption and deterioration of living standard, etc.

The process of modernization of the industry structure is still slow and burdened by many difficulties. The structure of industrial production is characterized by low share of branches featured as growth carriers, compared to the branches of general consumption sphere. The share of the complex of equipment and lasting consumables production and of other more propulsive production is not sufficient to provide for inclusion in international economic cooperation.

The structure of industrial production is also characterized by insufficient export orientation and high import dependence.

Despite the growth in certain production areas by higher manufacturing stages, diversification of production structure and range of industrial production is not satisfactory. It is still founded on basic raw materials, with dominant share of products from traditional activities.

In the period following the independence, the number of enterprises in the area of industry has increased by three times, the ownership structure has changed significantly, the process of restructuring of loss-making companies and liquidation of non-profitable companies is in its final stage, and development of small businesses has been intensified.

It is a general assessment that since 1992, industrial enterprises have undergone

significant changes in terms of ownership, operations organization and production restructuring, which is of vital importance for the more efficient production management and enhancement.

Acquired structural changes in industrial production create solid grounds for further extension and intensification of these processes for the purpose of establishing more efficient economic structure in line with market requirements.

The main feature of the structure of the industry is the spatial disproportionality in production forces and funds distribution. Misbalanced territorial development of industry is also manifested through exceptional differentiation of the level of industrial development. Concentration of production industrial facilities is one of the main reasons for the territorial polarization of the population and other development activities and their funds. The said processes of spatial polarization of industrial activities are mainly carried out contrary to the determinants of spatial structure of overall development factors (especially location), and are unequally guided by measures of planning and other regulation.

Goals

- More balanced and rationale spatial distribution of industry;

- Industrial development to be founded upon optimal utilization of comparative advantages of individual areas in the country and appropriate dispersion of industrial facilities;

- Balanced distribution of industrial facilities in space in line with the main development factors;

- Selectivity and opposition to certain industrial branches allocation in Skopje agglomeration;

- Stimulation of selective development of industry in small centres, especially in underdeveloped areas;

- Inclusion of environmental preferences in industry development and allocation and distribution;

- Industry development towards more efficient management and technological upgrading;

- Rationale combination and allocation of available resources through effectuation of existing and construction of new production facilities;

- Strengthening of efforts aimed at establishing production, technological, as well as management, credit and financing and other types of cooperation with foreign partners;

- Increase of the scale of investments;

- Higher reliance on the production based on available labour and personnel engagement, especially through their increased creativity in terms of improved technology and work organization;

- Revival of production in existing facilities through renewal and technical and technological innovation thereof, in order to enable higher level finalization of products and their market competitiveness;

- Industry development should to a greater extent rely on the application of scientific achievements and technical and technological progress and innovations in technological processes;

- Special accent to be placed on the development and technical and technological progress of all branches, beginning with propulsive ones, such as: electronics, electric industry, machinery production, transport means production, chemical industry and metalworks industry;

- Establishment of conditions for introduction of information technologies, flexible technologies, technologies of new materials, bio- technologies, energy related technologies, etc.;

- Export to become a key factor in production growth for the purpose of expanding the products placement markets, to provide import of raw materials and semifinished products and improve external liquidity;

- Increased mobilization of internal potentials aimed at accumulation and investment, as well as more effective use of

foreign resources as key factors, goals and objectives in terms of exit of industrial and agro-industrial sectors from disinvestment zone.

Planning determinants

Based on the information and determinants of the National Strategy for Economic Development of the Republic of Macedonia (MASA*, 1997), as well as on the up-to-date developments, with an accent on the concept of sustainable development, the main determinants of long-term industry development include:

- Change in production structure with more emphasized contribution by manufacturing and export oriented branches, as well as application of modern information technology, in combination with labour intensive branches;

- Revitalization of existing mining and metallurgical facilities through introduction of new process technology, as well as provision of higher level of environment protection;

- Process cycles closure with an effort to retain all materials within closed cycle to the maximum level possible;

- Minimum procurement of raw materials compared to existing ones, to be compensated with improved recycling infrastructure, enabling collection, selection and recycling of waste materials;

- Establishment of conditions for higher level of finalization of non-ferrous metals through involvement in production of higher number of products attractive for the market;

- Development of the complex of equipment and durable consumption goods, noting relatively low share in the current structure of industry;

- Revitalization of electric machines, appliances and devices manufacturing industry;

* Macedonian Academy of Science and Arts

- Production and technological modernization of existing chemical industry facilities;

- Revitalization of existing facilities of base segment of textile industry, as well as leather and shoes production industry;

- Reconstruction and modernization of vegetables and fruit processing industry;

- Reconstruction and modernization of tobacco processing industry.

The achievement of the above described concept should be based on the following strategic options:

- Process of ownership restructuring should enable higher participation of private sector and equalization among all ownership;

- Finalization of the process of economic restructuring, resulting in closure of inefficient facilities or their adaptation and re-orientation in line with market operation conditions;

- Technological restructuring in line with the requirements for industry modernization and rehabilitation;

- Flexible specialization of production based on current development and research activity and innovation of production programmes;

- Export orientation of leading sectors and branches, reduced import dependence, i.e. substitution of import (especially for raw materials, fuel and spare parts) through continuous introduction of scientific, technical, technological and organizational innovations and inclusion in modern internationalization of global economy. Priority branches/sectors in terms of this strategy include: machinery production, electronics, micro-electronics, automatics, transport means manufacturing, chemical industry and food processing industry;

- Wider introduction and development of environment and space friendly industrial production through saving technologies development (with regard to natural resources, energy, fuel and labor force) and/or low/no waste generation technologies;

- Increased efficiency of production, based on increased labour productivity,

efficient utilization of material resources, improved product quality, improved organization of work, etc.;

- Observation of investment criteria based on continuous planning and adoption of market criteria of management;

- Strategy of industrial facilities allocation taking into account the following: spatial structure of allocation factors, sustainable distribution of material production funds, in terms of overall space of the country and needs for complex development of certain territorial units;

- Stimulation of motivation with production companies for projects and programmes implementation aimed at development of underdeveloped areas, through specific policies (monetary, fiscal, regional, investment, etc.);

- Development of small scale enterprises, for the purpose of applying the concept of decentralized industry development and allocation;

- Strategy for high technologies development in line with the concept of sustainable development: low raw material and energy intensity, high participation of expertise, high market fragmentation by specific requirements, high investment in pre-competition investigations, and comprehensive influence on the features of many segments of socio-economic system.

Industry development by individual municipalities is expected to include construction of small scale, flexible facilities, higher share of propulsive branches, especially electronics, machinery production, transport means manufacturing, chemical and pharmaceutical industry, metalworks, services and agro-industrial sector, as well as labour intensive branches for the purpose of employment increase.

The above described production orientation of industry creates conditions for its more balanced and rationale distribution in space. Future production will rely less on the abundance of natural resources, and more on personnel creativity, entrepreneurship, management and marketing, as well as on

cooperation with major local and especially foreign companies.

Based on the above, industrial production is expected to be represented in all municipalities in future and contribute to growth thus providing for higher employment, improved living conditions for citizens throughout the country. This will enable more balanced industry development, from regional point of view.

Measures of regional policy, especially measures of the policy for support provision to economically underdeveloped areas in the country, influence the more rationale industry distribution. Such measures are expected to improve investment conditions throughout the country and achieve more rationale industry distribution.

Planning and organized manner of infrastructure extension and establishment of other favorable conditions for industrial facilities location in areas around cities and in wider rural areas in general will lead to trends expected to enable, by 2020, industry dispersion. In doing this, the model of concentrated dispersion is taken into account, both in macro-economic space of the country and micro-economic space of individual regions, poles and development axis, industrial zones in urban and rural centres. Under modern conditions, and under specific conditions in the country, industry is almost location neutral, i.e. only part of the industry is connected with raw material basis. In terms of location, industry is by its nature and activity assuming concentration in certain points-poles, axis and zones for several branches using common infrastructure and other common services, resulting in positive economic effects. On the other side, such concentration of industry of complementary and accessory nature, is the most favorable form of environment preservation and improvement.

Industry as leading economic activity and driving force of the overall economic development has significant impact on the environment. In circumstances of adopted development concept - "sustainable

development", efforts should focus on substantial changes in development strategy and policy and spatial allocation of industrial branches, on the basis of the principles of environmental protection. According to the philosophy of sustainable development, economic or industrial development and environment protection constitute a single system. Sustainable development assumes alternatives for threatened natural and man-made values and establishment of more human society and environment. Settlement of conflicts in this system should rest upon interaction between spatial-socio-economic components of development.

4. TRANSPORT AND COMMUNICATIONS

Current status

Transportation system of the Republic of Macedonia is composed of road, railway, air, lake transport and post traffic and system of communications consists of telecommunications and radio-diffusion system.

- Road transport

Republic of Macedonia has a total of 9.573 km categorized road network, out of which 879 km are national roads, 3438 km regional and remaining 5256 km local roads. Major part of national roads or 573 km are included in the European roads "E" system, while only 228 km of motorways may be included in the TEM TEM (Trans-Europe Motorway) system of roads, these being: Kumanovo - Petrovec - Veles - Gradsko - Negotino - (to Demir Kapija); Skopje - Petrovec; Hipodrom-Miladinovci; Skopje (Saraj) - Tetovo; Tetovo - Gostivar.

Out of the total length of categorized national and regional road network, 203 km (4.7%) are at motorway level, 341 km (7.9%) are with tracks width of 7 meters or more, 297 km (6.9%) are of tracks width of 7 meters and less, 1523 km (35.3%) have width bigger than 5.5 meters, 306 km (7.0%) are of width ranging from 4.5 and 5.5 meters, 872 km (20.2%) with width less than 4.5 meters and 774 km (17.9%) are with earth tracks.

According to the level of motorization (150.74 train/1000 inhabitants), Republic of Macedonia has significantly lagged behind developed European countries. In the domain of passengers and goods transport, significant drop has been recorded compared to 1985, which means that current transportation means in road transport sub-system are able to meet current demands for transportation.

- Railway transport

Railway transport in the Republic of Macedonia is performed through a network of 699 km open rail lines, 226 km station and 102 km industrial rail tracks.

The lines: Tabanovce-Skopje-Gevgelia (213.5 km), General Jankovic-Skopje (31.7 km) and Veles-Bitola-Kremenica (145.6 km), apart from national transport, also have international character.

Other lines: Gjorce Petrov-Kicevo (103 km), Bakarno Gumno-Sopotnica (29.4 km), Gradsko-Sivec (16.3 km), Kumanovo-Beljakovci (30.3 km), Veles-Kocani (85.6 km) and Zajas-Tajmiste (6.6 km) are of regional nature, while lines from the Skopje junction (37 km) are of local relevance. The main pressure on only half of the railway network in Macedonia (388 km) is up to 22,5 tons, while the rest are with shaft pressure ranging from 16 to 18 tons.

Out of the total railway network, 231 km (Tabanovce-Skopje-Gevgelia), or close to 33% open lines and 83 km station lines are electrified. Railway network has 68 railway stations (32 regulated by modern SS and TK devices, and the rest regulated by electric and mechanical devices), one shunt station, six depots and 62 standing points. Stations are mainly passengers and goods transport, except Skopje station intended for passenger transport only.

- Air transport

Demand for passengers and goods transport in air transport domain are met through airports in Skopje and Ohrid. Airports are used mainly for international air transport. They are equipped with runway able to receive, under certain conditions

(constraints) all types of aircrafts, including the heaviest ones.

Existing sports airports in Skopje (Stenkovec), Kumanovo (Rezanovce), Bitola (Logovardi), Stip (Susevo) and Prilep (Malo Konjari), satisfy most of current demands. However, certain improvements of runways are required (all of them have grass covered runways), as well as upgrading of airports equipment.

The number of registered agricultural management airport is eight, as follows: Bitola (Logovardi and Dame Gruev), Prilep (Saradinovo), Veles (Karatmanovo), Sveti Nikole (Pesirovo), Stip (Vrsakovo), Negotino (Crveni Bregovi) and Gradsko (Rosoman). Airports are constructed with combined runways, so that part (300 h 20 m) is made of concrete, and other part (500 h 50 m) of grass. It has been assessed that the coverage by this type of airports does not meet the current demands, especially in the regions of Polog, Ohrid-Prespa and vicinities of Kumanovo, Strumica and Gevgelia.

- Waterway transport

The Republic of Macedonia has no access to sea, and its waterway transportation is carried out through the ports of neighbouring countries: Bulgaria, Greece, Albania and Federative Republic of Yugoslavia.

Lake transport includes only passenger transport, mainly in Ohrid Lake. Such transport is carried out by four ships, with a capacity of 150 passenger seats and four smaller boats with 25 passenger seats. By the end of 1995, a total of 2.200 motor boats were registered, with an average capacity of 8-10 passenger seats, out of which 150 perform transport activity (taxi) and 150 are fishing boats.

- Post traffic

By May 2003, the number of registered post units was 316. Number of inhabitants served by one unit is 6.158, or area of 81 km². In the same period, 515 windows were registered or 3.778 inhabitants per window.

Internal traffic is organized, mainly, by transport vehicles, and international traffic to Republic of Albania and Republic of Bulgaria with road transportation means, to Republic of Greece and Federative Republic of Yugoslavia by railway, and to other countries by air transport.

- Telecommunications

Introduction of new digital systems provide for the application of integrated network of services in telephone traffic through the so called ISDN (Integrated Service Digital Network). This network is organized in three hierarchical levels: international, national or transit and primary and local level.

Hierarchical structure of commutation systems is organized in a similar manner. In 2001, telecommunication network used total of 446 telephone exchanges with 538.507 subscribers. Total of 792.036 telephone lines, 800 telegraphic lines, 1835 lines of public pay phones, 22.044 Internet lines, 1498 MAKPAK lines and 170.000 mobile lines have been installed.

With a density of 21.9 installed telephone connections per 100 inhabitants in 1998, Macedonia lags behind European countries (Greece 52.2, Germany 56.9, Sweden 67.4).

The capacity of mobile telephone exchange by the end of 2001 was 265.000 subscribers, and in May 2003, total of 383.811 users were registered. By 2002, total of 210 basic stations and 1.600 transfer units were established, and the mobile telephony signal covered 95% of the territory of the Republic of Macedonia and 98% of the population.

- Radio broadcast system

The basis of radio broadcast system is the Macedonian Radio Television (MRT). The current development level of basic and additional networks acquires the following percentual coverage: I television programme 96.8%; II television programme 93.5% and III television programme 50.5%; I radio programme (HF/FM) 73.5%; II radio

programme (VHF/FM) 73.0%; III radio programme (VHF/FM) 33.0%.

Current radio network enables full day (24 hours) coverage with 99% of the territory of Macedonia with the first radio programme, or 60% over day and 40% over night coverage with the second radio programme. In addition to this, radio programme covers part of the area in border zones in neighbouring countries, as well as over night coverage with the first radio programme of the area of Mediterranean and Western Europe.

For the purpose of connecting the Republic of Macedonia with European countries and performance of Eurovision exchange, MRT has established links with the point "Kitka" in Federative Republic of Yugoslavia, "Vidin" in the Republic of Bulgaria, and the connection "Larisa" in the Republic of Greece. News and events receiving from Eurovision is also conducted through the receiving satellite station, located in Skopje. For the purposes of signals distribution from Macedonia towards Eurovision centre in Brussels, the existing terrestrial connections passing through neighbouring countries are used.

Apart from MRT, two additional televisions (A1 and Sitel) and three commercial radio broadcast companies (Kanal 77, Antena 5 and Radio Ros) were registered at national level in 2003.

According to the data of the Telecommunications Administration, in Macedonia, in 2003, the number of concessionaires holding license for TV programme broadcasting was 45, and for FM radio programme - 68 concessionaires.

Goals

- Development of transportation system that will minimize harmful impacts of the traffic on environment and contribute to an improved quality of living in urban and rural areas of the country;

- Establishment of transport inter-modal centres, as main contact points among different transport types, as a precondition

for developing an efficient, flexible and cost-effective transportation system;

- Reconstruction and development of transportation and communication networks and transportation means provision through application of state of art technology at the levels of preparation, designing, construction, maintenance and use;

- Dynamic implementation of infrastructure, through application of priorities based on transport and economic criteria, in line with strategic determinants of the country when transportation acts as initial factor of the overall development;

- Specific development of tracks passing through or by major urban agglomerations;

- Increase of pass through capacity of the Macedonian transportation system, its connection with neighbouring countries and joint connection to European systems and trends;

- Provision of high level of mobility of the population and products, as well as high level of telecommunication connection of the territory of the Republic of Macedonia;

- Provision of appropriate accessibility throughout the national territory, thus creating conditions for more balanced development in all areas of the Republic of Macedonia;

- Planning of transportation system to support and foster economic development and international integration of the Republic of Macedonia;

- Permanent control for high traffic security and environment protection;

- Maximum utilization of traditional roads when locating the main transportation corridors;

- Adjustment of general tracks positioning to natural relief characteristics;

- Adaptation of transportation network to the main generators of future movements of passengers and goods transport;

- Minimization of transportation time and costs;

- Space protection and reservation for future strategic transport corridors, for which there are no transportation and economic arguments at present;

- Interconnection of the Republic of Macedonia and neighbouring countries, for the purpose of establishing links between MRT and other points.

Planning determinants

- Communication integration

Communication network of the Republic of Macedonia, composed of several communication sub-systems, has been established through the system of transport and communications, upon which national space is organized. Communication systems of the Republic of Macedonia are expected to improve, upgrade and develop towards two directions:

- External connection of the country (strategic corridors);

- Internal connection inside the country (regional and local needs).

External connection of the country will be based on defined communication corridors in line with international conventions and agreements, reflecting our orientation towards European and Balkan commitments towards economic and technological communications.

Owing to its central position in the Balkans, the Republic of Macedonia represents a natural crossroad in the system of European and Balkan communications, through which numerous communication corridors directed north-south (Corridor 10) and east-west (Corridor 8) pass.

The internal connection is based on the need for more balanced development of the Republic of Macedonia, where the following should be respected:

- Spatial distribution of essential resources and their communication accessibility;

- Population and activities localization;

- Existing infrastructure of populated places.

The level of transport system development and its integration into corresponding European systems and trends will determine the directions and communications of people and products, as well as capital and information flows within the country and beyond. Development is expected to include expansion, improvement and modernization of communication sub-systems in the Republic of Macedonia.

- Road transport

Road network planning and development in the Republic of Macedonia are based on the provisions on roads categorization, strategically defined international corridors in the domain of road transport, up to date built European road network -TEM with "E" mark of roads, so far developed national and regional road network, as well as on the goals contained in the long-term development strategy.

Roads network with "E" mark defining international road transport corridors through the Republic of Macedonia include:

- E - 65 overlapping with parts of national roads M-3, M-4 and M-5: (SM-Blace-Skopje-Tetovo-Kicevo-Trebenista-Ohrid-Bitola-Medzitlija-GR) - Road transport north-south corridor;
- E-75 overlapping the national road M-1: (SM -Tabanovce-Kumanovo-Veles-Bogorodica - GR) - Road transport north-south corridor;
- E-850 overlapping part of the national road M-4: (AL-Kjafa San-Struga - Trebenista-E-65) - Part of the road transport west-east corridor;
- E-871 overlapping the national road M-2: (BG - Deve Bair -Kriva Palanka - E-75) - Part of the road transport west-east corridor.

Highway road network of the Republic of Macedonia will consist of:

- Sveti Nikole-Kadrifakovo 11.50 km;
- Strumica-Marvinci 32.00 km;
- Jazince (border with SM)-Tetovo.....29.49 km;
- Blato (border with Republic of Albania)-Debar-Drugovo44.50 km;
- Kicevo-Brod-Prilep-Drenovo-Kavadarci-Negotino 116.00 km;

- M-1 (SM -Tabanovce-Kumanovo-Veles-Bogorodica-GR);
- M-2 (BG-Deve Bair-Kriva Palanka-Kumanovo-M-1);
- M-3 (SM - Blace-Skopje-Petrovec-M-1)
- M-4 (AL-Kjafa San-Struga-Kicevo-Skopje-Miladinovci -M-1);
- M-5 (BG - Delcevo - Kocani - Stip - Veles -Prilep - Bitola - Resen -Ohrid-Trebenista -M-4), (Branch: Bitola-Medzitlija-GR);
- M-6 (BG-Novo Selo-Strumica-Radovis-Stip-M-5); (Branch: Strumica-M-1);
- M-7 (AL-Blato-Debar-Kicevo-Prilep-Kavadarci-Lakavica-M-6).

The main road corridors will continue to follow traditional directions north-south (Corridor 10), and east-west (Corridor 8), crossing in the area between the cities: Skopje, Kumanovo and Veles. Thus, part of national roads in the Republic of Macedonia will form three basic road corridors, that should be constructed so to have technical characteristics compatible with the European motorways system (TEM):

- North-south: M-1 (SM -Kumanovo-Veles-Gevgelia-GR);
- East-west: M-2 and M-4 (BG-Kriva Palanka-Kumanovo-Skopje-Tetovo-Struga-AL and a branch Skopje- SM);
- East-west: M-5 (BG-Delcevo-Stip-Veles-Bitola-Ohrid-AL and a branch Bitola - border with GR).

The motorway and national way network is supplemented by regional roads, which will compose the total road network of the Republic of Macedonia, together with local categorized roads.

For the purpose of completing the national road network, it has been proposed to re-categorize the following regional into national road sections:

– Total:233.49 km.

The dynamics of the network development to provide for full coverage of the Republic of Macedonia will support transportation demand (expected volume of traffic), requirements related to the integration into the European road system, as well as economic capability of the country, and the routes of international and regional roads will pass outside populated areas and there has been a proposal that delevled solutions for cross-sections with remained network are applied.

The road network concept by 2020 envisages construction of around 9.700 km roads, out of which 987 km national roads, 3.100 km regional and over 5.600 km local roads.

Finalized road network will occupy and area of around 40.000 hectares for more than 11.250 km roads constructed,

where 1.250 km national roads, 3.500 km regional and over 6.500 km local roads.

The density of road network will reach 37.7 km roads per 100 km², and with its completion after 2020 it will amount 43.8 km roads per 100 km² of the territory of the Republic of Macedonia.

Railway transport

The concept of railway system development is based on the need for overall railway modernization and extension, as well as connection of the railway network of the Republic of Macedonia with the relevant networks of the Republic of Bulgaria and Republic of Albania.

Within the planning period, the railway network of the Republic of Macedonia should be composed of the following lines:

1. National railway lines of international character:
 - SM- Tabanovce-Skopje-Gevgelia-GR 213.5 km
 - SM - Blace-Skopje 31.7 km
 - SM -Kremenica-Bitola-Veles 145.6 km
 - BG -Kriva Palanka-Kumanovo 84.7 km
 - AL-Struga-Kicevo-Skopje..... 143.0 km
 - Total: 618.5 km
2. Regional lines:
 - Bakarno Gumno-Sopotnica 29.4 km
 - Gradsko-Sivec 16.3 km
 - Veles-Kocani 85.6 km
 - Zajas-Tajmiste 6.6 km
 - Total: 137.9 km
3. Local lines:
 - Skopje junction..... 37.0 km
 - Total: 37.0 km

The following main railway corridors have been envisaged in the Republic of Macedonia:

- North-south direction - existing international railway section Belgrade-Skopje-Athens (Corridor 10);

- East-west direction - international railway section Sofia-Skopje-Tirana, under finalization (Corridor 8).

In addition to existing connections Tabanovce and Blace on north, and Gevgelia and Kremenica on south, appropriate connection will be accomplished towards the Republic of Bulgaria, and towards the Republic of Albania on west, thus providing for full integration of Macedonian railway system with the appropriate systems of neighbouring countries.

Possible secondary connections with the neighbouring countries include:

- Veles-Blagoevgrad, with the construction of the new railway line from Kocani to Blagoevgrad;

- Smokvica-Petric, with the construction of the new railway line over the whole relation. Alternative: construction of railway line Smokvica-Dojran-Dojrani;

- Sopotnica-Radozda, or Bitola-Ohrid-Radozda, as possible alternatives for connection with Tirana.

In order to achieve full coverage of the country with a network of railway lines within the definite concept of the railway system, the following local directions should be included:

- Kumanovo-Ovce Pole;
- Stip-Strumica;
- Kicevo-Sopotnica.

Expectations in the planning period by 2020 include:

- Modernization of North-South Corridor, its technical and technological equipment in order to reach the standards for national roads by UIC;

- Finalization through completion of railway connections Beljakovce-Gjuesevo and Kicevo - Kjafasan;

- Connection of REK "Bitola" with the mine "Zivojno", as alternative solution for coal transportation, taking into account the demands for coal by REK Bitola in the coming period;

- Maintenance of other railway sections in proper condition or modernization thereof if such investments are justified;

- Modernization of alternative section 10A of Corridor 10, or section Veles-Kremenica;

- Development of integrated transport, or technical and technological full equipment of Macedonian railway in order to enable it to perform the tasks and include in international transportation is in line with the strategy for railway transportation development and feasible possibilities of the Republic of Macedonia.

The plan of the railway network by 2020, which is a stage before final implementation, envisages construction of around 120 km new railway lines.

The density of the railway network in the target 2020 should amount 3.18 km per 100 km² of the national territory.

Full implementation of the railway (after 2020) will occupy area of approximately 1.350 ha, required for more than 1.100 km railway lines and coverage of the national territory with around 4.3 km per 100 km² area. The network should be supplemented with around 250 km station railway tracks and around 200 km railway tracks for industrial purposes.

Air transport

The air ways in the Republic of Macedonia constitute an integrated part of European network of air corridors with a width of 10 navigational miles within which flights over the national territory are carried out in a controlled manner.

The current eight air ways over the Republic of Macedonia are expected to be restructured in the coming period into so called one-way routes with clear distinction between upper and lower levels,

through introduction of additional 2 to 3 air roads in the western sector and additional 1 to 2 in East-West corridor. Flights over the territory of the Republic of Macedonia will be performed mainly through one-way air ways, organized and technically and technologically equipped and led by our own area control.

By 2005, the accompanying radio-navigation infrastructure will be finalized and modernized in the context of international developments and trends, through introduction of radar system with primary three-dimensional radar in the area Skopje and replacement of existing VOR/DME with new upgrades of ILS systems in Ohrid and Skopje. In the period 2005 to 2020, the Republic of Macedonia intends to join the global system of satellite navigation of air traffic by appropriate technical and technological support.

Primary airports network in the Republic of Macedonia should be composed of four airports for public air transport, namely in Skopje, Ohrid, Strumica and Bitola. The Airport in Skopje will be upgraded to receive and forwarding intercontinental aircrafts (through extension of the existing runway or through construction of a new airport on another location), the airport in Ohrid will be reconstructed into higher -II category, while new airports envisaged to be erected in Strumica and Bitola will be mainly for cargo transport of goods.

Reconstruction of Skopje airport or identification of new airport location that will be able to serve all types of passenger aircraft without limitation, is a determinant to derive from the development of the Study on airports.

Secondary airport network is proposed to be composed of five reconstructed and technically fully equipped sport airports and 15 airports for commercial navigation, seven of which new. In addition to this, around 20 grounds for further development of navigational sports and tourism development should be developed,

complying with international regulations applicable to these types of airports.

Compared to the current 492 ha, the air transport infrastructure will cover more than 1.000 ha.

- Waterway transport

The only type of waterway transport in the Republic of Macedonia, mainly for passenger transportation, will remain the lake transport in natural and artificial lakes. On international level, waterway transport will include connection Ohrid-Pogradec through Ohrid Lake.

Republic of Macedonia has no access to sea and it will satisfy its demands for marine transportation by sea waterways through sea ports in Serbia and Montenegro, Republic of Albania, Republic of Bulgaria and Republic of Greece.

Under the new social and economic circumstances, including the trends for new markets approaching and establishment of cost-effective connection with the neighbourhood and wider, Republic of Macedonia could, through development of navigable river way Dunav-Morava-Vardar, join the European system of waterways, thus establishing direct link with Northern Sea and Aegean Sea.

Post network, telecommunications and radio broadcast system

By 2020, in order to secure uninterrupted performance of internal and international post traffic, the post network has to incorporate all populated areas in the Republic of Macedonia. To this end, establishment of 108 new postal units has been projected in municipalities with underdeveloped postal network and popplaces lacking postal network, thus reaching the total number of 424 postal units. By this, the density will be 4.589 inhabitants per postal unit or one postal unit will serve a territory of 61 km².

The development of post traffic in the Republic of Macedonia will be oriented

towards new types of services, such as: expansion of "accelerated post", sales by catalogue, electronic mail, service by agreement, bureau fax, mediation type of service in the fields of finance, establishment of Track & Tracke for shipments tracking from receipt through transmission to handling, connection with international information systems: EDI system, IPS, Tulip as postal administrations, etc.

Telecommunications in the Republic of Macedonia note a trend towards full network digitalization, service integration and existing networks convergence into wider telecommunication network. Total of 891.000 digital telephone connections have been projected, thus reaching a density of 43 telephone connections per 100 inhabitants. Connection of digital commutation systems into the new organizational structure at local, transit and international levels will be acquired through digital systems for latest technology transmission, using optical cables as media, and Earth satellite centre would be used for part of international links.

Introduction of optics (optic cable and optic system for subscriber access), as well as WWL wireless subscriber access has been planned in the local network.

Mobile telephony has been projected to cover 98% of the territory and 100% of the population of the Republic of Macedonia, reaching a density of 25 mobile phones per 100 inhabitants.

The Internet, which has achieved notable expansion in a short period, is projected to provide service for 80.000 subscribers, 50% out of which are expected to be subscribers to AD "Makedonski telekomunikacii".

Development of telecommunication network should follow the latest technical and technological trends in the world, in line with the conditions and the needs for their implementation in the

telecommunication network of the Republic of Macedonia.

The fision of the long-term development of Macedonian telecommunications is oriented towards integration into the global information society, by providing palette of multimedia and interactive communications to users.

Radio broadcast system provides transmission, broadcasting and distribution of radio and television programmes and other information substance, intended to provide global reception in the free space and via cable radio and television network on the territory of the Republic of Macedonia. This system is expected to follow global technological development in this domain, in order to enable full and balanced coverage of all municipalities in the country with proper quality radio and television programme.

Radio broadcast system is composed of several telecommunication networks transmitting and broadcasting radio and television programmes, establishing programme, audio and video communication with neighbouring national RTV centres, as well as with the European Broadcast Union (EBU). In certain regions of the country, it provides service and transmission of radio programmes of public local companies.

Radio programmes in the Republic of Macedonia are broadcasted through:

- Middlewave transmitters network;
- Two networks in ultra shortwave area;
- Network of SB and UKB transmitters of local radio stations.

Television programmes in the Republic of Macedonia are broadcasted through:

- VHF and UHF network for first programme;
- VHF and UHF network for second programme;
- UHF network (under construction, for third programme).

Radio and TV programmes are broadcasted through:

- Network of micro-wave programme links for audio and video signals transmission, from studios to source transmitters;
- Micro wave programme links connecting RTV centre in Skopje with neighbouring countries;
- Functional network for reporters and correspondents links and service links;
- Network of programme links at 400 MHz.

Global concept of future radio broadcast system developments based, before all, on the strategic determination for existing radio and television networks finalization in areas where programmes are not received, especially in border areas where radio and television signals of neighbouring countries are dominant.

By 2020, construction of 117 new TV/UKB tutor points has been projected, in order to achieve full coverage of the population in the Republic of Macedonia. Together with the existing 122, the number of such facilities will reach 239. This number of facilities will provide 99% coverage of the population in the Republic of Macedonia with radio and television programmes, with signals level and quality complying with international prescribed technical requirements. Development programme also envisages construction of satellite radio broadcast centre aimed at covering users throughout Europe. The system will enable technical and technological unity and functional connection with radio broadcast systems of other countries in accordance with mutual multilateral agreements.

Integrated transport

Integrated combined transport for fast transfer of goods by modern methods and technologies is expected to develop in relation to the development of supportive goods transportation centres. To this end, synchronization among terminal blocks for

land and air traffic should be established and demands for transit, import-export and internal goods transportation harmonized. For economic and environmental reasons, goods micro and macro distribution should be optimally organized through support goods transportation centres, that should integrate several functions:

- Information and communication;
- Goods transportation via air;
- Goods transportation via railway;
- Goods transportation by road freight vehicles;
- Combined goods transportation;
- Goods storage.

The development of support goods transportation centres will depend, before all, on the overall economic development of the country and individual regions therein, as well as on the economic interest of users. They will be developed close to major urban centres, in order to contribute to both economic and environmental effects.

5. PROTECTION AND IMPROVEMENT OF ENVIRONMENT, NATURAL AND HISTORICAL HERITAGE AND DEVELOPMENT OF TOURISM

5.1. ENVIRONMENT

Current status

The application of the system of environmental protection to support stable and sustainable development, through natural resources and urban development management, relies on the valorization of areas in terms of the overall quality of the environment. The status of the quality of the environment on the area of the Republic of Macedonia has been analyzed through data on the points of appearance of waste streams, the quantity and the quality, the manner of their distribution, evacuation and environment modifications, as part of all activities in the space. Conflicts in the environment are due to the following:

- Use of agricultural land for food production in areas with degraded

environmental quality as a result of human activities and natural contamination. There is no soil quality monitoring.

– Degrading of large soil areas resulting from open mines and excavations and transport of mineral resources, macro-flotation and disposal of tailings, tehnogene waste from smelting and power generation plants, industrial landfills for hazardous waste, municipal solid waste landfills lacking the basic sanitary and technical conditions and recultivation of abandoned open mines and landfilling areas. Final disposal of low and medium radioactive waste has not been settled and its disposal is done as temporary.

– Changed use of high class agricultural land for unproductive use, especially in the vicinity of major populated places and cities, on one side, and abandonment of arable areas on the other, with the ultimate result of productive land loss.

– Degrading of forests close to populated areas, forest cutting within national parks for fuel wood, drying out of certain species due to pests, physiological exhaustion of forests in conditions of disturbed air quality and phenomena of acid rains.

– Stagnation of economy resulting in out of date technologies use, poor quality of energy resources, insufficient utilization of systems for waste gases purification, municipal and industrial waste water treatment, having emissions of pollutants into the air and water above maximum permissible norms and human health threat as consequences. There is no monitoring of trade in, storage, processing, production and transport of hazardous materials as direct hazards for accidents.

– Disturbed quality of surface and ground water resources, resulting from discharges of effluents, penetration and run-off of chemical substances from agricultural areas and their transportation to watercourses through erosion, penetration of leakages from landfills,

storm waste water run-offs from transportation lines, thus preventing their utilization for water supply and irrigation of certain areas.

– The current problems are further deepened through the difficulties in the enforcement of existing legal measures, their partial nature, as well as insufficient coordination among the entities composing the system of protection and control in the relevant institutions.

Through complex analyses, the areas with disturbed quality of the environment have been identified as follows:

1. Highest level and long-term threat to environment and human life have been recorded in the cities and vicinities of: 1-Skopje, 2-Veles, 3-Bitola, 4-Tetovo and 5-Kavadarci.

2. Occasional threat to air quality and permanently unfavorable quality of waste water recipients have been noted in the following cities and their vicinities: 6-Stip, 7-Kumanovo, 8-Prilep, 9-Gostivar, 10-Strumica, 11-Kicevo, 12-Resen, 13-Radovis and 14-Kocani.

3. Permanent deterioration of the quality in some of the watercourses in the basins of the following rivers: 1-Vardar, 2-Crna Reka, 3-Bregalnica, 4-Strumica 5-Pcinja, 6-Crn Drim, 7-Treska, downstream of major settlements, mines, industrial facilities and thermal power plants. The quality of ground water resources has been insufficiently investigated, but incidental measurements have shown disturbed quality of ground waters in the settlement of Dracevo, in the area of the village of Petrovec, near HEK "Jugohrom", wells used for water supply for Veles.

4. Wider areas with potentially disturbed quality include the following valleys: 1-Skopje, 2-Veles river erosion expansion, 3-Bitola fields, 4-Polog, 5-Kumanovo area, 6-Prilep area, 7-Strumica and Radovis, 8-Kicevo, 9-Gevgelia-Valandovo, 10-Prespa, 11-Tikves, 12-Kocani, 13-Demir Hisar, 14-Ohrid-Struga, 15-Ovce Pole, 16-Debar-Reka areas, as a

result from human activity (use of artificial fertilizers, exploitation of mineral resources, air pollution sediments, waste waters from settlements). Natural contamination of soil depends on geo-chemical composition of the ground, leaving behind impacts on the quality of food produced in these areas. There have been no investigations of the relation between toxic and radioactive elements present in the composition of the soil in individual areas and human health.

Goals

- Implementation of activities aimed at recultivation and revitalization of areas with threatened quality of the environment as identified in the National Action Plan, by priorities set therein, through targeted programmes for protection of waters, air, soil, forests, biological diversity, protection against noise and solid waste management;

- Evaluation of the value of the space and ecosystems and their integration in the planning by means of economic and other parameters (e.g.: in the value of the gross domestic product);

- Establishment of programme indicators and monitoring over health status of the population related to environmental quality;

- Establishment of appropriate infrastructure that will integrate comprehensively the polluters, the entities responsible for the control, the supervision and the monitoring, as well as institutions responsible for development planning, in accordance with the law;

- Energy savings in industrial production, agriculture, energy and public works, through co-generation (combined heat and electricity production) from waste gases from smelting and thermal power generation facilities, utilization of landfill and biogas and recycling as forms of raw materials, natural resources and energy saving; water resources saving through comprehensive management of water

management systems: rational use of water from all sources, including surface and ground waters, and securing of minimum flow in water courses in order to maintain favorable capacities in recipients after pollution receipt;

- Determination of ecological capacity of areas and sites, as basis for definition of the level of their utilization, quality and quantity of pressures on the space that can be sustained thereby;

- Environmental management in regions should be based on comprehensive monitoring (ambient and emission), establishment of standards and measures of protection depending on prior defined capacity of individual areas in accordance with the law.

Planning determinants

- Spatial differentiation

Spatial and structural grouping of the national territory into environmental management regions in the frameworks of basins of major rivers has been conducted in order to identify homogenous areas morphological connection of which leads to effects on the quality of the environment from different activities within the specific area. Identification of planning areas is carried out for the purpose of coordinated and integrated management of the quality of environment, where primary carriers of activities, based on mutual interaction and agreement, are the units of the local self-government. Environmental management regions are established by municipalities belonging to the following river basins:

- 1 – Upper course of Vardar, 2 - Pcinja, 3 - r. Treska, 4 - Crna Reka, 5 - Crn Drim and Ohrid-Prespa region, 6 - Bregalnica, 7 - Strumica 8 – Lower course of Vardar and Dojran region, based on the following criteria: basins are homogenous morphological entities; river valleys are situated in areas under greatest burden of human activities; settlements gravitate towards river valleys; rivers are energy resources, but also recipients of waste

waters and transporters of pollutions and erosive deposits; winds, as factors of pollution distribution in air, appear with dominant wind direction along the course of river valleys; river valleys are frequent routes for transportation infrastructure – source of permanent and accidental disturbances of environmental quality.

The river basin of Vardar in its upper course includes the following municipalities: Vrutok, Srbinovo, Dolna Banjica, Gostivar, Cegrane, Vrapciste, Brvnica, Negotino-Polog, Bogovinje, Kamenjane, part of Zelino, Sipkovicica, Tetovo, Dzepeviste, Tearce, Vratnica, Jegunovce, Kondovo, Gjorce Petrov, Cucur-Sandevo, Cair, Suto Orizari, Gazi Baba, Karpos, Studenicani, Kisela Voda, Aracinovo, Ilinden, Petrovec, Zelenikovo and Veles; The river basin of Treska includes the following municipalities: Saraj, Sopiste, Samokov, Zajas, Oslomej, Makedonski Brod, Plasnica, Vranestica, Kicevo and Drugovo; river basin of Crna Reka: Dolneni, Zitose, Krusevo, Krivogastani, Sopotnica, Demir Hisar, Capari, Kukurecani, Bitola, Bistrica, Bec, Novaci, Mogila, Dobrosevo, Topolcani, Prilep, Staravina, Vitoliste, Konopiste, Kavadarci Rosoman; river basin of Pcinja: Lipkovo, Kumanovo, Staro Nagoricane, Klecovce, Rankovce, Kriva Palanka and part of Kratovo; river basin of Bregalnica: Sveti Nikole, Lozovo, part of Kratovo, Probistip, Zletovo, Kocani, Orizari, Makedonska Kamenica, Delcevo, Pehcevo, Berovo, Stip, Konce, Karbenci, Cesinovo, Oblesevo, Zrnovci, Blatec; river basin of Strumica: Novo Selo, Murtino, Kuklis, Strumica, Vasilevo, Bosilovo, Strumica, Podares, Radovis; river basin of Crn Drim: Resen, Kosel, Ohrid, Meseista, Struga, Dolgozdi, Velesta, Vevcani, Labunista, Belcista, Lukovo, Centar Zupa, Debar, Rostusa, Mavrovi Anovi; river basin of the lower course of Vardar and Dojran region: Caska, Bogomila, Izvor, Gradsko, Negotino, Demir Kapija, Miravci,

Valandovo, Bogdanci, Star Dojran and Gevgelia.

Selection of locations for future regional sanitary landfills is based on operational gravitational zones, in accordance with the following criteria: topographical configuration composing a whole; quantity and type of solid waste produced in included urban and rural agglomerations; diameters of transport that may be justified in technical and economic terms. Such zones are: 1) Skopje (Gazi Baba, Gjorce Petrov, Karpos, Kisela Voda, Centar, Cair, Suto Orizari, Cucur-Sandevo, Kondovo, Saraj, Sopiste, Ilinden, Petrovec, Zelenikovo, Studenicani, Aracinovo); 2) Polog-Mavrovo (Tetovo, Dzepeviste, Tearce, Brvenica, Kamenjane, Bogovinje, Sipkovicica, Zelino, Jegunovce, Vratnica, Gostivar, Negotino-Polog, Vrapciste, Cegrane, Dolna Banjica, Srbinovo, Vrutok, Mavrovi Anovi); 3) Debar-Radika (Debar, Centar Zupa, Rostusa); 4) Kicevo-Brod (Kicevo, Drugovo, Oslomej, Vranestica, Zajas, Makedonski Brod, Samokov, Plasnica); 5) Veles-Ovce Pole (Veles, Bogomila, Caska, Izvor, Sv. Nikole, Lozovo); 6) Ohrid-Struga (Ohrid, Belcista, Kosel, Meseista, Struga, Lukovo, Delgozdi, Labunista, Velesta, Vevcani); 7) Prespa (Resen municipality); 8) Pelagonia (Bitola, Bistrica, Novaci, Bac, Staravina, Mogila, Kukurecani, Capari, Dobrosevo, Demir Hisar, Sopotnica, Krusevo, Zitose, Prilep, Dolneni, Topolcani, Krivogastani, Vitoliste); 9) Tikves (Kavadarci, Konopiste, Rosoman, Negotino, Demir Kapija, Gradsko); 10) Gevgelia-Valandovo (Gevgelia, Miravci, Bogdanci, Star Dojran, Valandovo); 11) Strumica-Radovis (Strumica, Novo Selo, Vasilevo, Bosilevo, Kuklis, Murtino, Radovis, Konce, Podares); 12) Stip-Kocani (Stip, Karbenci, Kocani, Cesinovo, Oblesevo, Zarnovci, Orizari, Vinica, Baltec, Probistip, Zletovo); 13) Pcinja-Kriva Reka (Kumanovo, Lipkovo, Orasac, Klecovce, Staro Nagoricane, Kriva Palanka, Rankovce, Kratovo); 14) Malesevo gravitation zone

(Berovo, Pehcevo, Delcevo, Makedonska Kamenica).

Within each zone, the system of collection, selection, pre-treatment, recording and declaration of composition, quantities, transport, handling and disposal of one (and not more than two) sanitary landfills for inert solid and partially hazardous waste will function. Favorable altitude for landfills location is in the range between 300 and 850 m (in order to avoid adverse impacts from temperature inversions in depressions, i.e. low temperatures and heavy precipitation in higher areas); favorable topographic conditions include narrow gorges, economically justified distances from populated places of up to 25 km if the road network is at the level of regional roads and up to 40 km if transport is carried out over highway; location is not allowed in areas with protected natural resources, natural rarities, cultural and historical monuments, within major river basins (in order to avoid protection measures against flooding), within areas reserved for water management energy generation facilities, exploitation of mineral resources, within zones under active seismic hazard; locations should provide areas enabling waste disposal for not less than 20 years, in order to justify investment in the related infrastructure and controlled degradation of occupied area. Hazardous and radioactive wastes will be disposed at central landfill, the location of which will be determined by separate study. It is recommended to identify a micro-location in the area of Krivolak, as suitable space satisfying all above stated criteria.

Concept of protection

Rehabilitation and revitalization of areas (set priorities in the National Action Plan) and prevention should be carried out through specific programmes and plans for protection of waters, air, soils, forests, biological diversity, protection against noise, industrial and technological

accidents, solid waste management. Environmental problems should be settled at the source of their appearance, through the following system of measures: 1- in industry and energy –substitution of energy resources, closure and substitution of technological processes by “clean” ones, application of modern devices for treatment, controlled application, transport and disposal of hazardous and radioactive matters, development, i.e. recultivation of landfills for “technogene” waste; 2 - in mining – controlled soil degradation by open mines, rehabilitation of dams of tailings disposal sites, and rehabilitation of damaged tailings disposal sites; 3 – in transport – leaded petrol phase-out, increased public compared to private transport and optimal urban zoning, technical and biological measures for agricultural land protection along busy roads; 4 – in agriculture – restricted application of chemicals and orientation towards biological agriculture in areas suitable for that; 5 – in forestry –protection of forest stock in the surrounding areas of populated places and protected areas against uncontrolled cutting and increased potential danger of fires, approach of ecosystem in forests protection, application of modern methods in the protection from pests, growing of fast growing varieties for fuel wood, organized and planned collection of forest products and curative herbs.

Determination of environmental capacity (environment’s capability to receive pollutants, without long-term and irreversible damages and acceptable cost for negative effects reduction) should be carried out within planning areas (regions) through their functional and structural hierarchical division into four areas-models of protection at equal or similar type and level of human induced burden, established in accordance with their use. First extent of protection in “natural” zones (strictly protected areas in national parks) as most vulnerable with regard to their

ecosystem and excluded human impacts; Second extent of protection in “managed” zones – forests, tourism, hunting and fishing zones, hilly and mountainous arable areas and pastures through moderate restriction of the level of utilization of endangered areas; Third extent of protection in “cultivated” zones – agricultural areas under intensive agriculture, exploitation of mineral resources, management of power generation facilities and infrastructural corridors and application of rehabilitation, biological, recultivation and technical measures; Fourth extent of protection in “urban and sub-urban” zones – for the purpose of integrated environmental management, requiring huge financial resources investment and application of optimal systematic protection and control measures. Future changes in the relevant areas should be preceded by environmental impact assessment studies, depending on their individual capacity.

In order to achieve the required protection in identified priority areas, it is necessary to:

- Establishment of zones and measures for protection of areas and sites with natural values, rarities and significance for commercial utilization creating basis for development. Preservation of the quality of surface and ground waters is of highest priority when used or to be used for water supply (before all, quality of Treska river, the water of

which will be transferred to water management areas beyond its own river basin), lakes quality management (Ohrid, Prespa, Dojran) where turnover of 65.4% of total overnight stays are expected to be realized, protection of the quality of high trunk forests, agricultural areas under intensive utilization and ecological areas for “biological” food production: Mariovo, valley of Babuna river (Municipality of Bogomila), Porecie.

Implementation of regime of measures aimed at protecting areas and sites that limit development or pose threat to human health due to their status of threat or degradation. This includes management of the quality of air in Skopje, Veles, Tetovo, Bitola and Kicevo, quality of water courses used for irrigation: Vardar in Polog and Middle Vardar from Veles to Demir Kapija, Crna from Bitola to Tikves, Bregalnica from Stip to its entry into Vardar, rehabilitation and revitalization measures in areas degraded from municipal, industrial and technogene waste disposal in Skopje, Tetovo, Bitola, Veles, Probistip, Kavadarci, Oslomej, soil quality monitoring in areas with indications of harmful and hazardous matters, undertaking of appropriate protection measures, etc.

According to the level of significance, i.e. threat, protection measures should be implemented in two phases: in the period by 2010 and period after 2010.

Areas and sites by priority for protection

Table 36

Region		Vardar river - upper course
Remedy and reclamation of degraded areas	Landfills for solid and liquid wastes	<i>By 2010:</i> Reclamation of municipal landfill for Gostivar near Banjica Springs and "Vardariste". Reclamation of the landfills of "Jugohrom", Topilnica "Zletovo" and HIV. Identification of suitable and their development. <i>After 2010:</i> Reclamation of industrial landfills at OHIS, landfills for technogene waste at "Steelworks" and "Refinery". Identification of new suitable and their development.
	Open pits and burrows	<i>After 2010 :</i> Reclamation of temporary burrows in non-metals exploitation in Polog (temporary burrow near the village of Felise, used partially for municipal waste disposal).
Protection of permanently endangered development resources	Zones and measures for arable areas protection	<i>By 2010:</i> Technical and biological measures of protection for: Polog along the road M4. Establishment of monitoring network for continuous monitoring of the soil quality in Polog, Skopje and Veles areas. <i>After 2010:</i> Application of management measures in industry and transport for the purpose of protecting arable areas along northern industrial zone in Gostivar, eastern industrial zone in Tetovo, north-eastern, eastern and south-eastern peri-urban zone in Skopje area along industrial zones and southern industrial zone in Veles.
	Zones and measures for springs and ground water resources protection	Strict observation of protection zones of Rasce, wells Nerezi-Lepenec. <i>By 2010:</i> Establishment of protection zones around wells in Jurumleri, water supply wells in Veles. <i>After 2010:</i> Protection zones around the springs of Vrutok, Banjica Springs, geothermal resources in the area of Skopje (Katlanovo).
	Surface water resources protection	<i>By 2010:</i> Municipal and industrial waste waters treatment in settlements gravitating to Vardar River up to Rasce springs. <i>After 2010:</i> Industrial waste water treatment from western industrial zone through Lepenec River up to its entry in Vardar and industrial waste water pre-treatment when discharged directly into Vardar River. <i>After 2020:</i> Construction of waste water treatment plants for Skopje and Veles.
Preventive protection of potentially endangered areas	Zones for tourism	<i>By 2010:</i> Establishment of zones under highest burden with tourist and recreation streams in the area Tetovo-Popova Sapka-Lesnica. Application of protection measures and solid waste disposal organization.
	Forests	<i>By 2010:</i> Protection of endangered forest species in the areas of the municipalities of Sipkovic, Tearce, Vratnica and Veles. <i>After 2010:</i> Forestation of degraded forests in the municipalities of Jegunovce, Sopiste, Studenicani and Veles
	Ground and surface water resources	<i>After 2010:</i> Waste water collection from settlements gravitating to upper course of the rivers Pena, Babuna and to Topolka River up to the entry into Vardar. Protection zones around Ulivericki and Golemi Izvori (springs).
Region		Treska River
Remedy and reclamation of degraded areas	Landfills for solid and liquid wastes	<i>After 2010:</i> Reclamation of the landfill for technogene waste of TPP Oslomej.
	Open pits and burrows	<i>After 2010:</i> Reclamation of degraded areas resulting from coal exploitation in Oslomej and iron ore in Tajmiste.
Protection of permanently endangered development resources	Zones and measures for arable areas protection	<i>After 2010:</i> Biological measures for Kicevo Pole (fields) protection in the vicinity of coal excavations and landfills at TPP "Oslomej". Biological and technical measures for arable areas protection along the road M ₄ .
	Zones and measures for springs and ground water resources protection	<i>By 2010:</i> Protection zones around Studencica springs.

	Surface water resources protection	<i>By 2010:</i> Waste water treatment from the settlements towards Treska River up to the springs, dam on "Kozjak" accumulation. Prohibition of cage fish breeding. Legally binding obligation for projects environmental impacts assessment (tourist, small businesses, farms), located within the region of Kozjak accumulation.
Preventive protection of potentially endangered areas	Zones for tourism	<i>After 2010:</i> Regulatory measures and establishment of transportation regime in tourist zones in the settlements of Zdunje, Blizansko, Dolna Belica, areas around Knezevo Monastery near Kicevo. Organized solid waste management related to exceptional sensitivity of the karsts in the region.
	Forests	<i>By 2010:</i> Protection of endangered forest species in the municipalities of Samokov and Makedonski Brod.
	Ground and surface water resources	<i>By 2010:</i> Protection zones around the springs of Pitran and Belcica. Restriction of further fish ponds erection on Belica River. <i>After 2010:</i> Waste water collection running towards Baciska River.
Region		Pcinja
Remedy and reclamation of degraded areas	Landfills for solid and liquid wastes	<i>By 2010:</i> Reclamation of abandoned lagoons in pigs farm in Kumanovo <i>After 2010:</i> Reclamation of municipal landfill for Kumanovo.
	Open pits and burrows	<i>By 2010:</i> Completion of the construction of the dam of tailings disposal site in the mine of "Toranica".
Protection of permanently endangered development resources	Zones and measures for arable areas protection	<i>After 2010:</i> Technical and biological protection measures for areas covered by irrigation systems along road sections M ₁ and M ₂ Soil quality monitoring and testing of heavy metals content in Kumanovo Pole (fields).
	Zones and measures for springs and ground water resources protection	<i>By 2010:</i> Establishment of protection zones around geothermal resources in the area of Kumanovo.
	Surface water resources protection	<i>BY 2010:</i> Protection zones along accumulation of "Glaznja" and Lipkovo Lake. <i>After 2010:</i> Treatment of overflow waste water from the tailings disposal site at "Toranica" when it contains metals concentration higher than MPC. Treatment of waste water from pigs farms running towards Konjarska River, from Leather Factory and Factory for seamed tubing to Kumanovska river. <i>After 2020:</i> Waste water treatment in Kumanovo.
Preventive protection of potentially endangered areas	Zones for tourism	<i>After 2010:</i> Regulatory measures for tourist and recreation sites in the areas of Kumanovo and Kriva Palanka and solid waste disposal organization.
	Forests	<i>By 2010:</i> Anti-erosive measures through forestation of areas around Glaznja accumulation, Lipkovo Lake, on the left bank of Kriva Reka (river). <i>After 2010:</i> Forestation of area around future accumulation Vakuf on Kriva Reka.
	Ground and surface water resources	<i>After 2010:</i> Treatment of waste water running towards Kriva Reka. Protection zones around the springs Kalin Kamen and geothermal resources in Staro Negoricane. <i>After 2020:</i> Protection of surface waters of Otljanski Vrbi Slupcane River up to the sites planned for future water intakes.
Region		Bregalnica River
Remedy and reclamation of degraded areas	Landfills for solid and liquid wastes	<i>By 2010:</i> Reclamation of the existing municipal landfill for Stip. <i>After 2010:</i> Reclamation of the municipal landfill for Kocani and lagoons of the Paper Factory in Kocani.
	Open pits and burrows	<i>By 2010:</i> Reclamation of abandoned tailings disposal site of "Zletovo" Mine. Implementation of the project for rehabilitation and reclamation of tailings disposal site of "Sasa" Mine.
Protection of permanently endangered	Zones and measures for arable areas protection	<i>By 2010:</i> Controlled use of chemicals in agriculture and establishment of soil quality monitoring. Monitoring of the contents of heavy metals in north-eastern part of the

development resources		municipality of Sv. Nikole, southern parts of municipalities of Orizari and Stip.
	Zones and measures for springs and ground water resources protection	<i>After 2010:</i> Establishment of protection zones around geothermal resources in Kezovica, Dobrevo, Istibanja.
	Surface water resources protection	<i>By 2010:</i> Waste water recycling from the flotation of "Sasa" mine. Protection of Kiselicka River against waste water from the tailings of "Zletovo" mine. <i>After 2010:</i> Protection of Orizarska River against waste water from paper factory, treatment of municipal and industrial waters from Stip, pre-treatment of waste water from the slaughter house and distillation plant.
Preventive protection of potentially endangered areas	Zones for tourism	<i>After 2010:</i> Regulatory measures in tourist and recreation resorts in the areas of Stip, Berovo, Delcevo, Vinica, Sv. Nikole.
	Forests	<i>By 2010:</i> Forestation of the area around Kalimanci accumulation. Protection against fires in the forests of southern Osogovo mountains in the areas of Delcevo and Berovo. Intensive forestation in the area of Stip, protection of endangered forest species in the area of Malesevo.
	Ground and surface water resources	<i>After 2010:</i> Protection zones around accumulations Ratevo, Mavrovica. Protection of the upper course of Zletovica.
Region		Crna River
Remedy and reclamation of degraded areas	Landfills for solid and liquid wastes	<i>By 2010:</i> Reclamation of ashes and tailings landfill in REK Bitola, industrial landfill of Fenimak. <i>After 2010:</i> Reclamation of existing municipal landfills for Prilep, Bitola and Kavadarci.
	Open pits and burrows	<i>By 2010:</i> Reclamation of tailings sites of the coal mine at REK Bitola.
Protection of permanently endangered development resources	Zones and measures for arable areas protection	<i>By 2010:</i> Controlled use of chemicals in agriculture and establishment of soil quality monitoring and monitoring of the contents of heavy metals in the southern part of the municipality of Demir Hisar and Kavadarci area.
	Zones and measures for springs and ground water resources protection	<i>By 2010:</i> Protection zones around the springs Lukar and Kosmatec. Protection of ground waters used for water supply for the area "Golema Livada".
	Surface water resources protection	<i>By 2010:</i> Treatment of waste water discharged in the river of Dragor from the settlements and Bitola and pre-treatment of industrial waste water. <i>After 2010:</i> Treatment of waste water from Prilep, waste water from "Fenimak".
Preventive protection of potentially endangered areas	Zones for tourism	<i>By 2010:</i> Regulatory measures in tourist zones Krusevo, Pelister. <i>After 2010:</i> In Demir Hisar, Prilep area, Mariovo.
	Forests	<i>By 2010:</i> Intensive forestation in the areas of Prilep, Bitola, municipality of Vitoliste (Mariovo), municipality of Bac (Kajmakalan), Kavadarci, Demir Hisar areas.
	Ground and surface water resources	<i>Po 2010:</i> Zaštita na ak. Stre'ev o i na nejzinata pritoka Lera, slivovite na r. Stara i r. Do{nica.
Region		Crn Drim, Ohrid-Prespa
Remedy and reclamation of degraded areas	Landfills for solid and liquid wastes	<i>By 2010:</i> Reclamation of municipal landfills in Ohrid, Struga and National Park Mavrovo.
	Open pits and burrows	<i>After 2010:</i> Regulation of the tailings disposal site of the coal mine "Piskupstina".
Protection of permanently endangered development resources	Zones and measures for arable areas protection	<i>By 2010:</i> Controlled use of chemicals in agriculture in eastern parts of the municipality of Meseista. Establishment of soil quality monitoring and heavy metals concentrations monitoring.
Protection of permanently	Zones and measures for springs and ground	<i>By 2010:</i> Establishment of protection zones around Biljanini Izvori (springs), Radolista, Radozda, Vraniste, springs Sum, Vevcani springs.

endangered development resources	water resources protection	<i>By 2010:</i> Establishment of protection zones around geothermal resources in Debar area and springs Rosoki and Studena Voda.
	Surface water resources protection	<i>By 2010:</i> Completion of the waste water collector for Ohrid Lake and connection of surrounding settlements to it. Reversion of Sateska river in its former bed and application of anti-erosion measures. Reconstruction of waste water treatment plant for Resen. <i>By 2010:</i> Treatment of industrial waste water running towards Grasnica river.
Preventive protection of potentially endangered areas	Zones for tourism	<i>By 2010:</i> Till the completion of waste water collection system for Ohrid and Prespa Lakes, aimed at full connection of tourist facilities, continuous water quality monitoring and interventions in case of exceeded MPC. Establishment of seasonal regimes of transport in tourist zones and measures for more intensive use of public transportation. Regulatory measures in tourist zone of Mavrovo and treatment of waste waters from settlements.
	Forests	<i>By 2010:</i> Intensive forestation in the municipalities of Delogozdi, Meseista, Kosel, northern part of Resen, north and south of Debar Lake. Measures for protection of endangered forest species in Struga, northern parts of Galicica, municipality of Rostuse.
	Ground and surface water resources	<i>After 2010:</i> Protection of lower course of Radika.
Region		Strumica River
Remedy and reclamation of degraded areas	Landfills for solid and liquid wastes	<i>After 2010:</i> Reclamation of existing municipal landfills for Strumica and Radovis.
	Open pits and burrows	<i>By 2010:</i> Reclamation of open mines, rehabilitation measures at the tailings disposal dam in Bucim-Radovis.
Protection of permanently endangered development resources	Zones and measures for arable areas protection	<i>By 2010:</i> Controlled use of chemicals in agriculture in the municipalities of Vasilevo and Strumica. Soil quality and heavy metals content monitoring.
	Zones and measures for springs and ground water resources protection	<i>By 2010:</i> Protection zones around the springs of Glad.
	Surface water resources protection	<i>By 2010:</i> Controlled quantities of chemical agents in ore flotation. Overflow water quality monitoring in Topolnica river in relation to tailings disposal site at "Bucim". <i>After 2010:</i> Treatment of waste water from Radovis and Strumica.
Preventive protection of potentially endangered areas	Zones for tourism	<i>After 2010:</i> Regulatory measures in tourism zones in Bansko, Turija-Ograzden, Mantovo.
	Forests	<i>By 2010:</i> Forestation of the municipality of Novo Selo.
	Ground and surface water resources	<i>After 2010:</i> Protection of accumulation of Mantovo, Turija, Plavaja, Vodoca rivers.
Region		Vardar - lower course and Dojran Lake
Remedy and reclamation of degraded areas	Landfills for solid and liquid wastes	<i>After 2010:</i> Reclamation of existing municipal landfills for Negotino, Gevgelia, Valandovo and Star Dojran.
	Open pits and burrows	<i>After 2010:</i> Revitalization of open mine and tailings disposal sites at the coal mine in Negotino.
Protection of permanently endangered development resources	Zones and measures for arable areas protection	<i>By 2010:</i> Prohibition for surface water use from Vardar river for irrigation of agricultural lands (from Gradsko to Negotino). Restriction of chemicals use and soil quality monitoring in Tikves and Gevgelia-Valandovo valleys and heavy metals concentration measurements.
	Zones and measures for springs and ground water resources protection	<i>By 2010:</i> Establishment of protection zones for geothermal resources in Negorci, for the springs of "Moin".

	Surface water resources protection	<p><i>By 2010:</i> Reconstruction of waste water treatment plant for Dojran, finalization of waste water collection system and connection of surrounding settlements thereto.</p> <p>Undertaking of measures for transboundary agreements conclusion related to the use of water from Dojran Lake for irrigation.</p>
Preventive protection of potentially endangered areas	Zones for tourism	<p><i>By 2010:</i> Regulatory measures in Dojran tourist zone.</p> <p><i>After 2010:</i> Regulatory measures in tourist zone in the area of Gevgelia.</p>
	Forests	<p><i>By 2010:</i> Intensive forestation in the areas of Valandovo, Gevgelia, Dojran, and Demir Kapija.</p> <p>Protection measures against forests in the areas of Demir Kapija and Gevgelia.</p>
	Ground and surface water resources	<p><i>After 2010:</i> Protection of Konjska River.</p>

At national level, areas under highest burden include the basins of 1-Vardar-upper course and 2-Crna. On the other side, the most significant natural values and resources are present in the areas of the basins of 3- Treska, 4-Crn Drim and Ohrid-Prespa region. In the first phase, programmes for priority issues addressing should be developed in terms of these

regions protection, while in the second phase – for the remained four regions.

The assessment and the estimates of types and quantities of solid waste in the period by 2010 and from 2010 to 2020, within operational gravitation zones, represent basis for determination of sanitary landfills capacity, in close correlation with the determination of their favorable micro-location.

Projection of solid waste quantities by gravitation zones

Table 37

No.	Gravitation zones	Municipal solid waste in tons			
		Daily quantities	Per annum	Estimates by 2010	Estimates from 2010 to 2020
1.	Skopje grav. zone	670-704	244 390	3 112 030	5 725 080
2.	Polog-Mavrovo grav. zone	243-260	88 590	1 188 980	2 109 520
3.	Kicevo-Brod grav. zone	62-70	22 730	298 810	537 330
4.	Debar-Radika grav. zone	34-38	12 480	161 940	293 520
5.	Ohrid-Struga grav. zone	123-133	45 230	654 340	1 124 850
6.	Prespa grav. zone	18-20	6 770	97 030	168 970
7.	Pelagonia grav. zone	256-270	93 560	1 206 460	2 170 450
8.	Tikves grav. zone	69-72	25 090	330 800	589 040
9.	Gevgelia-Valandovo grav. zone	33-35	12 060	175 180	300 690
10.	Strumica-Radovis grav. zone	114-121	41 730	565 960	986 990
11.	Malesevo grav. zone	46-50	16 630	217 900	392 470
12.	Stip-Kocani grav. zone	151-158	55 160	713 390	1 279 300
13.	Veles-Ovce Pole grav. zone	96-100	35 270	455 390	816 260
14.	Pcinja-Kriva Reka grav. zone	173-184	63 240	823 370	1 427 410
Total:		2 088-2 215	762 930-808 870	10 001 580 12 501 975 m ³	17 971 880 22 464 850 m ³

1. In the area of the Skopje gravitation zone, the waste will continue to be disposed on the regional sanitary landfill "Drisla".

2. In the area of Polog-Mavrovo gravitation zone, wider zone of 2-10km² will be established on the territory of Vrapciste Municipality, along regional road 402.

3. For Debar-Radika gravitation zone, the area of the Municipality Centar Zupa, towards south outside basin area gravitating towards Debar Lake, along regional road to Lukovo is appropriate.

4. For Kicevo-Brod gravitation zone, micro-location for regional sanitary landfill should be determined, close to the existing municipal waste dump site in Oslomej, and abandoned location should be reclaimed.

5. Within Ohrid-Struga operational gravitation zone, wider zone at the border between Municipalities of Struga and Velesta, along the road R-418 will be established. Sludge transportation from the waste water treatment plant in "Vraniste" and its disposal at the regional sanitary landfill should be established. At the same time, undeveloped concentrated dump sites in the area of Bukovo and Struga dump site at 3 km west of the city exposed at strong winds should be reclaimed.

6. With regard to Prespa gravitation zone, the existing undeveloped concentrated dump site meets the criteria for suitable natural and location conditions. It is necessary to reclaim this site due to its filled in capacity and organize properly developed location for sanitary waste disposal at the site of "Ezerani" (between Resen and village of Zlatari).

7. For Pelagonia gravitation zone, the new identified location in the area of Stavica is suitable to be organized into sanitary landfill, where facilities and access roads construction should be in compliance with the protection zones of the near by site possessing cultural and historical values. At the same time, reclamation of the dump site currently used

for waste disposal for the city of Bitola, in burrow established by the excavations of the mine of "Suvodol".

8. For Tikves gravitation zone, compulsory reclamation of existing dump sites for municipal and industrial waste should be undertaken, due to their position towards arable land areas under irrigation system. Micro-location for sanitary landfill should be identified within the gravitation zone between municipalities of Kavadarci and Rosoman, along the regional road 108.

9. for Gevgelia gravitation zone, the location for regional sanitary landfill has been identified.

10. With regard to Strumica-Radovis gravitation zone, the existing dump site for Strumica on the right bank of Turija river is situated in a suitable geological environment. The site requires appropriate rehabilitation, reconstruction and development, in order to be used as regional sanitary landfill. Considering the fact that the public utility uses other sites as well (in the very bed of Trkanja river and in the bed of the low activity precipice at 2 km north-west of the city), their reclamation is compulsory.

11. In Malesevo zone, regional sanitary waste disposal requires identification of location at the crossing point of regional roads 503 and 527.

12. For Stip-Kocani zone, location for regional sanitary landfill has been determined at 4 km south-west of Stip.

13. For Veles-Ovce Pole zone, the area between national road section M-5, regional road towards Lozovo and railway line is considered suitable.

14. For Pcinja-Kriva Reka zone, the wider area around regional road 209, between national road section M-2 and railway line, is considered suitable.

Additional field investigations are necessary in the determined wider areas in order to identify final micro-locations for regional sanitary landfills.

During the first phase, regional landfills will be implemented for the

following operational gravitation zones: Stip-Kocani, Strumica-Radovis, Gevgelia, Polog-Mavrovo, Ohrid-Struga, Prespa, Pelagonia and Kicevo-Brod; in the course of the second phase, remaining sanitary regional landfills will be implemented in the relevant gravitation zones.

Construction waste will be disposed in an organized manner, in line of prior developed programme, independently from the system of sanitary waste disposal.

Further disposal of technological waste generated by industry, energy and mining will remain in the domain of entities that generate it. For the purpose of reducing the quantities of technological waste and land areas occupied by waste disposal, recultivation of these areas and maximum possible re-use of huge quantities of ashes, smelting slag, mining tailings, hydrocarbon deposits from Refinery and other points in industry and construction, will be defined in a thematic integrated study as a strategy for technological waste management, as one of the priorities within the environmental management regions.

Hazardous waste currently disposed at undeveloped internal industrial and municipal waste dump sites will be transported to the central landfill. Medium and low active radioactive waste currently disposed temporarily will be transported for final disposal to the central landfill. Infective waste from hospitals will be disposed at central landfill or be subject to incineration in case such facility is developed in Oslomej.

Harmful wastes from slaughterhouses and livestock farms will be disposed at specific, properly developed zones of regional sanitary landfills, while bacteriologically harmful wastes will be disposed at the central landfill for hazardous waste or be subject to incineration, as infective waste.

The period by 2010 has been adopted as transitional until all investigations are completed, as well as documentation and necessary supporting facilities for waste

reception, treatment and final disposal are finalized.

Under the regional landfilling, apart from the completion of landfills with all necessary supporting facilities, it is necessary to establish a system of waste collection and transport at a level of region, municipality and populated place, as regulated by law. At municipal level, waste transfer stations will be established, from where waste will be transported at certain intervals to the relevant regional landfills. Spatial and urban plans of municipalities that are or will be adopted, will determine locations for waste transfer stations in accordance with pre-defined criteria, and these will have a character of temporary waste disposal sites, till the completion of the regional sanitary landfills. However, they will have to apply protection measures in accordance with the law.

Waste separation should be practiced in all areas where waste is generated (paper, glass, plastics, rubber, aluminum, copper, textile, slag from boilers, construction waste, etc.), including the necessary pre-treatment of specific waste types at the sites of their generation for the purpose of improving the performance of the process of waste disposal at regional sanitary landfills. Recycling activities are envisaged at "Drisla" for the whole country, while incineration could be organized at the regional landfill in Oslomej. In the course of the second planning period, (from 2010 to 2020), when all conditions for proper operation of the solid waste management system will be in place, and linkage will be made in a chain from the point of waste generation to secondary materials re-use, significant improvement of the quality of the environment is expected as a result from acquired energy and raw materials savings, revitalized areas and abandoned dump sites, concentrated and controlled degradation of limited areas occupied by waste landfilling.

In the period 1998-2003, feasibility studies, plans and projects were developed, incorporating concepts and proposals of solutions for solid waste management in individual regions of the Republic of Macedonia.

- The "Kruger" Study developed in 1998, which was not adopted by the Ministry of Environment and Physical Planning, analysis the whole area of the Republic of Macedonia. It determines operational gravitation zones for future regional sanitary landfills location, taking economic pre-conditions as basis. The criterion for a region was the limit of 300.000 inhabitants.

- In 2000, the „Feasibility Study for Sanitary Landfill in Gevgelia" was developed by expert team engaged by the local self-government.

The Study proposes a concept of waste disposal upon waste undertaking from five municipalities, namely: Gevgelia, Bogdanci, Valandovo, Miravci and Dojran.

Based on this Study, Spanish Government intends to approve a credit to be used for procurement of equipment for waste compacting and packaging in order to rationalize its transport and save area occupied by sanitary landfill.

-In 2002, under the project "Protection of Radika River", along with the proposed system of municipal waste water treatment, sanitary landfill is envisaged in the village of Rostuse. There has been an Italian grant supporting the development of the sanitary landfill. The process of projects development has been initiated. This project includes the municipalities of Centar Zupa and Rostuse.

- "The concept and feasibility study for solid waste management in south-western part of Macedonia " was elaborated in the period from March 2002, and adopted in May 2003, financed by the German Bank for Rehabilitation and Development (KfW).

The area under the scope of this Study extends over around 8000 km², where

major cities are at a distance of around 100 km and it is populated by 420.000 inhabitants. According to socio-economic structure of the population, 70% is urban (or semi –urban population), and 30% is rural population.

For the purpose of establishing economically sustainable concept of household waste management, the projects covers 35 municipalities divided into four service regions on the basis of topographic conditions and parameters obtained on the quantities of generated waste.

Service region Bitola: two predominantly urban municipalities (Bitola, Resen); nine rural municipalities (Bistrica, Capari, Novaci, Bac, Staravina, Kukurecani, Topolcani, Mogila, Sopotnica);

Service region Prilep: two predominantly urban municipalities (Prilep, Krusevo); six rural municipalities (Krivogastani, Dolneni, Zitose, Demir Hisar, Vitoliste, Dobrusevo);

Service region Kicevo: two predominantly urban municipalities (Kicevo, Makedonski Brod); five rural municipalities (Zajas, Oslomej, Plasnica, Drugovo, Vranestica);

Service region Ohrid Lake: two predominantly urban municipalities (Struga, Ohrid); three municipalities with partially urban, partially rural nature (Labunista, Velesta, Vevcani); four predominantly rural municipalities (Belcista, Delogozdi, Kosel, Meseista);

Construction of new sanitary landfill has been envisaged in the vicinity of Veselcani – Alinci, close to the current landfill of the city of Prilep. This topic is described in the report titled "Study on Locations Exploration ". The volume of the landfill is set at the capacity of 2.650.000m³ and dimensioned for a period of 20 years. In order to reduce waste transport distances, three waste transfer stations have been envisaged, to accept, together with the sanitary regional landfill, the entire quantity of waste generated in

the five major cities in the project region (Bitola, Prilep, Struga, Ohrid and Kicevo).

In the course of the autumn 2003, a feasibility study on the eastern part of the Republic of Macedonia will be developed including the following regions: Malesevo with the municipalities of Berovo, Delcevo, Pehcevo, Makedonska Kamenica; Kumanovo-Kratovo with the municipalities of Kriva Palanka, Kratovo; Pcinja-Kriva Reka, with the municipalities of Staro Nagoricani, Kumanovo, Lipkovo, Orasac, Rankovci; Stip-Kocani with the municipalities of Stip, Kocani, Vinica, Oblesevo, Sveti Nikole, Probistip, Karvinci, Lozovo.

There has been an interest demonstrated by foreign investors and non-governmental organizations in the domain of solid waste management and investment improvement is expected to result in ongoing projects completion.

The future of waste recycling has been initiated at local level and in private sector. An association titled „Group for Trade in Secondary materials” has been established under the Chamber of Commerce. It is active in the field of recycling, using mainly scrap metal, certain quantity of waste plastics, batteries, glass.

The new Law on Waste Management is under development and will be approximated with the relevant Directives of the European Union. It should be adopted by the end of this year.

As of September 2003, the development of the National Solid Waste Management Plan will be initiated with the financial support from the European Agency for Reconstruction, which will represent a solid waste management strategy of the Republic of Macedonia and basis for confirmation of concepts proposed under the Spatial Plan.

5.2. NATURAL HERITAGE

Current status

Natural conditions in the Republic of Macedonia (geological structure, relief structure, climate, hydrography, pedological composition), enroll it among rare European countries with rich diversity of flora and fauna habitats.

Natural heritage protection in the Republic of Macedonia is regulated by the Law on Natural rarities Protection, Law on Ohrid, Prespa and Dojran Lakes Protection and Law on National Parks Protection, as well as by other laws and regulations covering this area. According to the mentioned laws, protection groups with the respective protection regime have been determined, as follows:

- General natural reserves - national parks (NP), strictly protected natural reserves (SPNR), scientific and research natural reserves (SRNR), areas with special natural properties (ASNP), specific landscapes (SL);
- Specific natural reserves (SNR);
- Individual flora and fauna species outside natural reserves (IFFS);
- Monuments of nature (MN).

Protection network covers 74 items of nature, with an area of 187.770 ha, or 7.11% of the total surface area of the country: national parks cover an area of 108.338 ha, or 4.2 % - Pelister, Mavrovo and Galicica; strictly protected natural reserves cover 12.730 ha or 0.47% - Ezerani and Tikves Lake; areas with special natural properties cover 2.338 ha or 0.09 % - Leskodol, Vodno and Kozle; the category of individual flora and fauna species outside natural reserves includes total of 14, or 2.709 ha, or 0.11% - Garska Reka (river), Drnacka Reka (river), Suvi Dol, Iberliska Reka (river), Menkova Livada, Tumba, Golem Kozjak, Katlanovsko Blato, Popova Sapka, Rupa, Neprtka, Kalozjana, Cam Ciflik and Ruzica; the category of monuments of nature covers 61.655 ha or 2.4 %, - Krusje Cave, Slatina Cave, Ohrid Lake, Kalnica,

Prevalec, Demir Kapija, Manastir, Mlecnik Cave, Trubarevo, Karsi Bavci, Markovi Kuli, Ubavica Cave, Dojran Lake, Ostrovo, Duvalo, Karaslari, Kale Banjicko (tower), Kolesino Waterfalls, Zvegor, Konopiste, Murite, Konjska Reka (river), Smolare Waterfall, Belesnicka Reka (river), Orlovo Brdo, Majdan, Skopje Fortress, Prespa Lake, Vevcani Springs, Mokrino, Mokriovo, Katlanovo Landscape and Matka Canyon.

The status of protection in this sphere does not comply with the legal requirements and provisions, resulting from disparity in the required level of protection and its practical enforcement, accompanied by non-observation of the obligations specified for individual protection regimes stipulated in the relevant legislation. There have been notable disturbances in natural processes of ecosystems, damages and destructions within protected areas and items, owing to the fact that other activities have been favorized, oriented towards natural resources exploitation, aimed at acquiring instant material benefits, without long-term analysis of the consequences from such approach.

Goals

– Preservation of protected areas of exceptional and unique values of relevance to scientific, cultural, educational, training, recreation and other functions;

– Preservation, protection and promotion of all specific representatives of individual ecosystems and outstanding biogeographical areas, especially representatives of individual types and landscapes;

– Among natural goods of similar natural values, priority to be given to the protection and promotion of those that are used with higher intensity (near populated places, transportation corridors, tourist resorts, etc.);

– For the purpose of preserving ambient, aesthetic and recreational resources of the space, focus should be

placed on protection, promotion and adequate use of major natural entirities;

– Full protection of flora and fauna through protection of major spatial units and guided use of natural resources in accordance with environmental conditions;

– Preservation of genetic and ecosystem biological diversity, based on geological stock investigation, inventory and database creation and categorization of elements and components of biological diversity;

– Provision of natural landscapes protection, ambient and areas surrounding cultural and historical monuments, in the framework of the comprehensive protection of those entirities;

– Establishment of eco-network of protected natural goods as areas of specific purpose and green corridors in order to protect the quality of the environment;

– Establishment of conditions for interconnection of areas and zones with the same or similar purpose and protection regime with those in the neighbouring areas of the Republic of Macedonia;

– Definition of management entities to take care of the natural goods protection, especially with regard to representative items.

Planning determinants

According to the level of study and acquired scientific and expert knowledge, 265 sites have been registered in the country intended for placement under appropriate protection regime by their features and natural values.

By 2020, different levels of protection should be provided for the following categories of items: 5 national parks covering a total area of 188.196 ha, 8 strictly protected natural reserves with an area of 13.682 ha, 38 scientific and research natural reserves 11.836 ha, 6 areas with special natural properties - 13.966 ha, 1 specific landscape of 200 ha, 26 specific natural reserves - 5.155 ha, 14 individual flora and fauna species - 2645 ha and 167

monuments of nature covering an area of 62.886 ha.

Overview of areas and items by protection groups

Table 38

Group	Title of the item	Municipality	Protection status
NP	Mavrovo	Mavrovi Anovi, Rostuse	protected
NP	Pelister	Bitola, Capari	protected
NP	Galicica	Ohrid, Resen	protected
NP	Jakupica	Sopiste, Studenicani, Zelenikovo, Bogomila, Caska, Veles, Samokov, Zelino, Brvenica	proposal
NP	Sar Planina	Vratnica, Tearce, Tetovo, Golema Recica, Sipkovic, Kamenjane, Gostivar, Vrutok, Mavrovi Anovi	proposal
SPNR	Begovo Pole	Kisela Voda	proposal
SPNR	Belcisko Blato	Belciste	proposal
SPNR	Ezerani	Resen	protected
SPNR	Lokvi	Prilep	proposal
SPNR	Pesti	Veles	proposal
SPNR	Ploce-Litotelmi	Stracin	proposal
SPNR	Tri Bari	Mavrovi Anovi	proposal
SPNR	Tikves Lake	Kavadarci	protected
SRNR	Pesocanska Reka (river)	Belcista	proposal
SRNR	Pelister I	Bitola	proposal
SRNR	Pelister II	Bitola	proposal
SRNR	Pelister III	Bitola	proposal
SRNR	Pelister IV	Bitola	proposal
SRNR	Topolka River basin	Veles	proposal
SRNR	Kartal	Vinica	proposal
SRNR	Ljuboten	Vratnica	proposal
SRNR	Kovanska Reka (river)	Gevgelia	proposal
SRNR	Negorska Banja	Gevgelia	proposal
SRNR	Sermeninska Reka (river)	Gevgelia	proposal
SRNR	Klisurska Reka (river)	Demir Kapija	proposal
SRNR	Studena Glava-Rid Trnik	Demir Kapija	proposal
SRNR	Kadina Klisura (gorge)	Zelenikovo, Studenicani	proposal
SRNR	Taorska Klisura (gorge)	Zelenikovo	proposal
SRNR	Zletovska Reka (river)	Zletovo	proposal
SRNR	Zrnovska Reka (river)	Zrnovci	proposal
SRNR	Mesnik	Kavadarci	proposal
SRNR	Straza	Kicevo	proposal
SRNR	Salakovski Ezera (lakes)	Kisela Voda	proposal
SRNR	Adzina Reka (river)	Mavrovi Anovi	proposal
SRNR	Borce	Mavrovi Anovi	proposal
SRNR	Volkovija	Mavrovi Anovi	proposal
SRNR	Dlaboka Reka (river)	Mavrovi Anovi	proposal
SRNR	Rostuse	Rostuse	proposal
SRNR	Sveti Jovan Bigorski	Mavrovi Anovi	proposal
SRNR	Strezimir	Mavrovi Anovi	proposal
SRNR	Trebiska Rupa	Mavrovi Anovi	proposal
SRNR	Crvena Reka (red river)	Vinica	proposal
SRNR	Senkoi orei	Murtino	proposal
SRNR	Osoj	Ohrid	proposal
SRNR	Trojaci-Kozjak	Prilep	proposal
SRNR	Golem Kotel	Resen	proposal
SRNR	Kula	Resen	proposal
SRNR	Golem Grad Island	Resen	proposal
SRNR	Ljubas	Rosoman	proposal
SRNR	Solunska Glava	Studenicani	proposal
SRNR	Skopska Crna Gora	Cucer	proposal
ASNP	Linak	Berovo	proposal
ASNP	Males	Berovo, Pehcevo	proposal
ASNP	Kozle	Petrovec	protected

ASNP	Korija	Krusevo	proposal
ASNP	Dojran	Star Dojran	proposal
ASNP	Vodno	Skopje, Sopiste, Saraj	protected
SL	Krusino	Kicevo	proposal
SNR	Baba-Sac	Vranesnica	proposal
SNR	Belasica	Novo Selo	proposal
SNR	Belo Grotlo	Staravina	proposal
SNR	Vaksinci	Lipkovo	proposal
SNR	Gornjani	Cucer	proposal
SNR	Goten	Berovo	proposal
SNR	Daboski Andak	Berovo	proposal
SNR	Drevenik	Demir Hisar	proposal
SNR	Enesevo	Sveti Nikole	proposal
SNR	Zajaska Reka (river)	Kicevo	proposal
SNR	Judovi Livadi	Pehcevo	proposal
SNR	Konjska Reka (river)	Gevgelia	proposal
SNR	Lisec	Zelenikovo	proposal
SNR	Lukar	Konopiste	proposal
SNR	Lukovo	Lukovo	proposal
SNR	Ploca	Jegunovce	proposal
SNR	Ramna Reka 9river)	Pehcevo	proposal
SNR	Reder	Staravina	proposal
SNR	Rezerve of cultivated hazelnut trees	Tearce	proposal
SNR	Vodenisnica	Murtino	proposal
SNR	Reka Ulomija (river)	Zrnovci	proposal
SNR	Salandzak	Valandovo	proposal
SNR	Sobri	Valandovo	proposal
SNR	Studencica	Drugovo	proposal
SNR	Studencista	Ohrid	proposal
SNR	Temniot Andak	Berovo	proposal
IFFS	Tumba	Kavadarci	protected
IFFS	Golem Kozjak	Kavadarci	protected
IFFS	Iberliska Reka (river)	Demir Kapija	protected
IFFS	Suvi Dol	Drugovo	protected
IFFS	Drenacka Reka (river)	Lukovo	protected
IFFS	Garska Reka (river)	Mavrovi Anovi	protected
IFFS	Katlanovsko Blato	Petrovec	protected
IFFS	Kalojzana	Resen	protected
IFFS	Menkova Livada	Kavadarci	protected
IFFS	Neprtka	Resen	protected
IFFS	Popova Sapka	Tetovo	protected
IFFS	Rupa	Resen	protected
IFFS	Rucica	Studenicani	protected
IFFS	Cam Ciflik	Strumica	protected
MN	Alilica	Rostuse	proposal
MN	Alipasica	Lukovo	proposal
MN	Alsar	Konopiste	proposal
MN	Aramiska Pestera	Kavadarci	proposal
MN	Arboretum	Gazi Baba	protected
MN	Babin Srt	Zupa	proposal
MN	Belesnicka Reka	Samokov	protected
MN	Beloviste	Gostivar	proposal
MN	Besiste	Vitoliste	proposal
MN	Bogovinje Lake	Sipkovic	proposal
MN	Bor	Kratovo	protected
MN	Brest	Gevgelia	proposal
MN	Bucin	Krusevo	proposal
MN	Vevcani Springs	Vevcani	protected
MN	Vevcani Lake	Vevcani	proposal
MN	Waterfall on Babauna	Bogomila	proposal
MN	Waterfall Dolna Skala	Vratnica	proposal
MN	Galiska Pestera (cave)	Kavadarci	proposal
MN	Gladnica	Gevgelia	proposal

MN	Gipsana Pestera Alcija (cave)	Debar	proposal
MN	Golubarnik	Samokov	proposal
MN	Gorna Slatinska Pestera (cave)	Makedonski Brod	protected
MN	Gol Covek	Gevgelia	protected
MN	Oak	Krivogastani	proposal
MN	Oak	Kocani	protected
MN	Oak	Rankovce	proposal
MN	Oak	Krivogastiani	proposal
MN	Oak	Orasac	protected
MN	Oak trunk	Sopotnica	proposal
MN	Oak	Zitose	proposal
MN	Oak	Dolneni	proposal
MN	Oak	Plasnica	proposal
MN	Oak trunk	Makedonski Brod	proposal
MN	Oak trunk	Lukovo	proposal
MN	Oak trunk	Delgozdi	proposal
MN	Oak trunk	Struga	proposal
MN	Oaks	Sveti Nikole	proposal
MN	Demir Kapija	Demir Kapija	protected
MN	Decki Kamen	Gjorce Petrov	proposal
MN	Div Prnar	Gevgelia	protected
MN	Dobovjani	Velesta	proposal
MN	Dojran Lake	Dojran	protected
MN	Dosnica	Konopiste, Demir Kapija	proposal
MN	Drenocka Klisura (gorge)	Kavadarci	protected
MN	Duvalo	Kosel	protected
MN	Fir	Vevcani	proposal
MN	Zvegor	Delcevo	protected
MN	Zmejovica	Makedonski Brod	proposal
MN	Zmijarnik	Lozovo	proposal
MN	Zrze	Dolneni	protected
MN	Poplar	Jegunovce	protected
MN	Springs Popolzani	Sopotnica	proposal
MN	Kale Banjicko (tower)	Caska	protected
MN	Kale (tower)	Centar	proposal
MN	Kalnica	Kavadarci	protected
MN	Karaslari	Veles	protected
MN	Katlanovski Predel (landscape)	Petrovec	protected
MN	Canyon Matka	Saraj	protected
MN	Karanikolic Lake	Sipkovic	proposal
MN	Karsi Bavei	Kratovo	protected
MN	Canyon on Gradeska Reka	Staravina	proposal
MN	Kolesino Waterfall	Novo Selo	protected
MN	Konopiste	Konopiste	protected
MN	Konce	Konce	protected
MN	Korica	Veles	proposal
MN	Hazelnut	Struga	proposal
MN	Krapa	Makedonski Brod	proposal
MN	Krastovec	Demir Kapija	proposal
MN	Kuklica	Kratovo	proposal
MN	Leska (hazelnut tree)	Resen	proposal
MN	Leska (hazelnut tree)	Novo Selo	proposal
MN	Leskovec Cave	Resen	proposal
MN	Majdan	Konopiste	protected
MN	Manastir	Vitoliste	protected
MN	Makedonski Dab	Ohrid	protected
MN	Markovi Kuli (King Marko's Tower)	Prilep	protected
MN	Macevo	Berovo	proposal
MN	Milkina Cesma	Gevgelia	proposal
MN	Mlado Nagoricane	Kumanovo	proposal
MN	Monospitovo Blato	Murtino	protected
MN	Morodvis	Zrnovci	protected
MN	Mocarnik	Radovis	proposal

MN	Mramor	Staro Nagoricane	proposal
MN	Mrenoga	Sopotnica	proposal
MN	Murite	Berovo	protected
MN	Nemanjinci	Sveti Nikole	proposal
MN	Orasac	Orasac	protected
MN	Orlovo Brdo	Negotino	protected
MN	Oreoc	Makedonski Brod	proposal
MN	Ostrovo (island)	Aracinovo	protected
MN	Ostrovo (island)	Ohrid	proposal
MN	Ohrid Lake	Ohrid, Struga	protected
MN	Pasin Most	Veles	proposal
MN	Pesna	Makedonski Brod	proposal
MN	Pestera Alena (cave)	Studenicani	proposal
MN	Pestera Bela Voda (cave)	Demir Kapija	proposal
MN	Pestera Goren Zmejovec (cave)	Demir Kapija	proposal
MN	Pestera Dona Duka (cave)	Saraj	proposal
MN	Pestera Mlecnik (cave)	Labunista	protected
MN	Pestera Konjska Dupka (cave)	Delcevo	proposal
MN	Pestera Krstalna (cave)	Saraj	proposal
MN	Pestera Ubavica (cave)	Dolna Banjica	protected
MN	Pestera Makarovec (cave)	Veles	proposal
MN	Pestera Nad Vrelo (cave)	Skopje	proposal
MN	Pestera Jaorec (cave)	Belcista	proposal
MN	Pestera Kalina Dupka (cave)	Rostuse	proposal
MN	Pestera Dracevska (cave)	Studenicani	proposal
MN	Pestera Simka (cave)	Mavrovi Anovi	proposal
MN	Pestera Momicek (cave)	Samokov	proposal
MN	Pestera Damjanica (cave)	Bogomila	proposal
MN	Pestera Cetiri Vрати (cave)	Veles	proposal
MN	Pestera Samoska Dupka (cave)	Ohrid	proposal
MN	Pestera Hristijanova (cave)	Sopiste	proposal
MN	Pestera Vrelo (cave)	Skopje	proposal
MN	Pestera Crkvice (cave)	Kavadarci	proposal
MN	Pesterna Crkva Sv. Marko (cave church)	Kavadarci	proposal
MN	Pestera Jaorec (cave)	Ohrid	proposal
MN	Pestera Izvor na Reka Babuna (cave)	Bogomila	proposal
MN	Pestera Kamenolom (cave)	Kicevo	proposal
MN	Pestera Utova Dupka (cave)	Drugovo	proposal
MN	Pestera Kalina Dupka (cave)	Drugovo	proposal
MN	Pestera Ginceica (cave)	Drugovo	proposal
MN	Pestera Orle (cave)	Samokov	proposal
MN	Pitran	Plasnica	proposal
MN	Propast Solunka	Bogomila	proposal
MN	Propast Lednik	Bogomila	proposal
MN	Plane tree	Bitola	proposal
MN	Plane tree	Struga	proposal
MN	Plane tree	Bogdanci	proposal
MN	Plane tree	Vevcani	proposal
MN	Plane tree	Valandovo	proposal
MN	Plane tree	Valandovo	proposal
MN	Plane trees	Valandovo	proposal
MN	Plane tree	Velesta	proposal
MN	Plane tree	Gevgelia	proposal
MN	Plane tree	Novo Selo	protected
MN	Plane tree	Novo Selo	protected
MN	Plane tree -Cinar	Ohrid	protected
MN	Plane tree	Radovis	proposal
MN	Plane tree	Struga	protected
MN	Plane tree	Bitola	proposal
MN	Plane tree	Tetovo	protected
MN	Podgorec Lake	Vevcani	proposal
MN	Prevalec	Veles	protected

MN	Prespa Lake	Resen	protected
MN	Prilepec	Prilep	proposal
MN	Parkac	Berovo	proposal
MN	Projfelski Vodopad (waterfall)	Mavrovi Anovi	proposal
MN	Pilou Lavi Gradec	Miravci	proposal
MN	Region Mariovo	Vitoliste	proposal
MN	Reka Babuna (river)	Bogomila	proposal
MN	Reka Javorica (river)	Demir Hisar	proposal
MN	Reka Pena (river)	Sipkovicica	proposal
MN	Recica	Tetovo	protected
MN	Rog-Belasica	Novo Selo	proposal
MN	Svetla Pesterica (cave)	Sopiste	proposal
MN	Slansko	Makedonski Brod	proposal
MN	Skopska Tvrđina (Skopje Fortress)	Centar	protected
MN	Smolarski Vodopad (waterfall)	Novo Selo	protected
MN	Plane tree stand	Novo Selo	proposal
MN	Plane tree trunks	Star Dojran	protected
MN	Tajmiste	Zajas, Kicevo	proposal
MN	Tonivoda	Rostuse	proposal
MN	Trabotiviste	Delcevo	proposal
MN	Ulanci	Gradsko	proposal
MN	Crna topola (black poplar)	Berovo	protected
MN	Crna dudinka (black mulberry)	Zletovo	protected
MN	Crni orevi (black walnut)	Demir Kapija	protected
MN	Crno Ezero	Sipkovicica	proposal
MN	Spela Bozguni	Sopiste	proposal
MN	Studer	Demir Kapija	proposal

The total area covered by the above stated areas and items is 298.566 ha km² or 11.6% of the national territory or increase by 4.4% compared to the current status.

Among the areas and items proposed for protection, particular attention is devoted to national parks, especially those proposed for declaration - Sar Planina and Jakupica, due to outstanding natural values and importance they have for the regions within which they are situated. In 2020, the total area under national parks will reach 188.196 ha, or increase from the current 108.338 ha for 79.858 ha new area.

The area of the National Park "Sar Planina" spreads over the territories of the following municipalities: Vratnica, Tearce, Tetovo, Golema Recica, Sipkovicica, Kamenjane, Gostivar, Vrutok and Mavrovi Anovi. Its specific values are characterized by: interesting relief forms, the most outstanding being the glacial, fluvial, karstic, denudation and nivelational geomorphological forms, exceptional diversity of flora and fauna. The total area to be covered by the National Park "Sar Planina" will amount 51.858 ha. Protection

of the national parks "Sar Planina" and "Mavrovo" requires cooperation with the neighbouring countries.

National Park "Jakupica" spreads over the territories of the following municipalities: Sopiste, Studenicani, Zelenikovo, Veles, Caska, Bogomila and Samokov. The most outstanding values include: geomorphological forms and processes, flora and vegetation features, abundance of fauna, hydrological resources and landscapes. The total area of the Park is 28.000 ha.

Natural reserves (strictly protected natural reserves, scientific and research natural reserves, areas with specific natural properties, specific landscapes and specific natural reserves), by their significance and area covered compose the next category of natural items of particular interest in the protection of specific natural phenomena, processes and articles. Total of 106 sites have been proposed for placement under protection, out of which 30 have been protected so far, and two are declared strictly protected natural reserves (Ezerani with an area of 2080 ha and Tikves Lake with an area of 10.000 ha).

Monuments of nature constitute the most numerous group with 163 items to be placed under protection by 2020. This number includes several subgroups of monuments, such as: geological-paleontological or mineralogical-petrographic, geomorphological, hydrological, botanical, dendrological and zoological. Till present, 44 items have been protected as monuments of nature. They are distributed all over the national territory.

While protecting natural rarities, particular attention should be paid to the manner, type and scale of construction within protected areas, in order to avoid or overcome conflicts and collisions with incompatible functions. To that end, the following principles have to be observed:

- Preservation of dominant characteristics in the existing natural condition;
- Optimal protection of areas with outstanding natural values;
- Promotion of natural heritage values;
- Minimal development and construction of infrastructure within areas containing natural values;
- Rationale construction of recreational infrastructure;
- Location of risk posing functions and properties outside sensitive ecosystems.
- Specific task remaining for completion in the coming period is the continuation of inventory and study of protected and threatened species of flora and fauna in the framework of a programme for genetic stock protection and work on the Red Book of Macedonia. The planned national information system development should include development of information system on nature protection as its segment.

5.3. CULTURAL AND HISTORICAL HERITAGE

Current status

Republic of Macedonia is rich in immovable cultural heritage of exceptional cultural, historical and artistic values, confirming the existence, the continuity and the identity of Macedonian people, as well as

those of citizens living within its borders as parts of Albanian, Turkish, Vlach, Serbian, Rhoman, Bosniak and other peoples through past millenniums.

According to official records kept in the national organization responsible for cultural heritage conservation and its local units, there are 11.200 immovable monuments of culture registered in the Republic of Macedonia.

Among the immovable cultural heritage discovered so far, the most prominent place belongs to archeological sites - 4.260, out of which 88 sites of scientific interest are under excavation.

The number of recorded and registered churches and monasteries is 1.726, with more than 150.000 m² frescos, 1.213 structures of old urban and rural architecture, 47 towers, fortresses and bridges, 1.026 monuments and memorial points, 126 structures of Islamic architecture, 24 old bazaars and other historical, urban and architectural entireties, 32 commercial buildings and several other types of buildings and immovables.

The immovable cultural heritage is distributed throughout the territory of the Republic of Macedonia, but the following can be pointed as most prominent areas: Ohrid-Struga area with highest concentration of monuments of culture; Pelagonia region with abundant wealth of all types of cultural heritage; Skopje monumental area, with numerous monasteries, churches, mosques, baths, inns, old bazaars and fortresses and other monuments from Middle Ages, and Vardar River valley accommodating highest number of archeological sites. Significant portion of immovable cultural heritage is situated in rural settlements and hilly-mountainous areas that are completely or partially abandoned, thus making their protection and use rather complex.

The Inventory of registered immovable monuments of culture has been established on the basis of data from the central register, municipal registers and individual decisions for proclamation, i.e. recognition of the attribute of monument of culture.

In the central register, by August 1997, the number of enrolled immovable monuments of culture was 1.088, located in the vicinity of 202 populated places in 83 municipalities in the country.

Highest number of registered monuments is found in the following municipalities: Bitola (72), Kratovo (29), Krusevo (34), Ohrid (69), Rostuse (49), Centar-Skopje (52), Struga (30), Strumica (49) and Stip (41).

The Inventory of registered immovable monuments of culture contains more than 5.000 (5.328) immovable goods located in all municipalities throughout the country, under well founded assumption of having monumental features. Highest number of monuments has been registered in the following municipalities: Berovo, Bitola, Veles, Vinica, Vitoliste, Delcevo, Demir Kapija, Demir Hisar, Dolneni, Kavadarci, Konopiste, Kumanovo, Makedonski Brod, Negotino, Ohrid, Prilep, Radovis, Resen, Samokov, Sv. Nikole, Sopotnica, Struga and Stip.

In the period between 1998 and 2003, the National Institute for Monuments of Culture Conservation of Skopje did not update the state of immovable cultural heritage. However, partial data gathered in field and possessed thereby lead to the conclusion that cultural heritage suffers physical destructions, especially old urban architecture.

According to the recommendation of the European Council for European inventory of cultural heritage, taking into account specific identity of the cultural heritage of the Republic of Macedonia, the immovable cultural heritage has been classified in two essential groups: monumental areas and individual monuments.

Memorial area is historical and memorial area, settlement or part of a settlement, complex or group of historical structures as monumental entireties, area of scientific interest and area of mixed values. This group of cultural heritage includes:

– Ohrid natural, cultural and historical area with the old part of the City of Ohrid,

protected Ohrid Lake and "Galicica" National park, as area of mixed value, of exceptional natural, historical, cultural and artistic values created by man through centuries;

– Areas of scientific interest (archeological sites) with traces of man's presence through centuries, from prehistory till present, including 88 most significant sites in the Republic of Macedonia, where archeological excavations have been or are still carried out;

– Historical and memorial areas with structures and features related to distinguished historical persons or events, mainly from 20th century and Second World War, with 70 sites of monuments, memorial chanel houses, memorial mausoleums, memorial museums and exhibitions, memorial houses and other historical and memorial areas.

– Monumental (building) entireties include 69 areas, settlements and archeological complexes, mainly from Middle and new ages, and they are of exceptional historical and cultural importance. These are: old part of the City of Ohrid, old urban core of Bitola, monumental complex "Varos"- Prilep; Skopje old bazaar, Bitola old bazaar, Ajduks' old bazaar in Kratovo; villages: Galicnik, Konjsko, Novo Selo (near Stip); fortresses: Samoil's Fortress in Ohrid, Kale in Skopje, Baltepe in Tetovo, Isar in Stip, Czar's Towers in Strumica, King Marko's Towers in Prilep and fortress in Radovis; residential complex in the old part of the Municipality of Centar-Skopje; Avzi Pasha inns in Bardovci; monasteries in: Rajcica, Begniste, Velusina, Kuckovo, Matka, Gorno Cicevo, Kuceviste, Zitose, Zurce, Banjane, Dabnica, Veljusa, Pobožje, Matejce, Slivnica, Glumovo, Lesok, Besiste, Veles, Markova Susica, Lesnovo, Krstoar, Banjane, Varoviste, Rostuse, Slepce, Vodoca, Ljubanista, Gornjane, Zvan, Slepce, Oreovec, Sisevo, Ljubanci, Manastir, Gorno Nerezi, Capari, Zrze, Konce, Kalista and Orah; church complexes in: Oktisi, Novo Selo near Stip and Sv.Spas (Holly Savior) in

Skopje; tekke* in the old part of Centar-Skopje and in Ohrid and tekkes in Tetovo and Struga.

Individual monuments are individual buildings with specific civilian, military, commercial, religious or tomb architecture of special cultural significance.

This group includes 500 individual architectural works, out of which more than 261 houses, 112 churches, 20 mosques, 20 buildings, 9 bridges, 9 clock towers, 8 towers, 7 baths; many inns, shelters, steam baths, fabric rolling mills and other individual monuments.

It has been assessed that the measures undertaken for the purpose of immovable cultural heritage protection, especially concerning their physical condition (construction works aimed at their restoration into their original condition and conservation), have not been sufficient, resulting in many negative consequences.

Goals

– Mandatory treatment of immovable cultural heritage in the process of spatial plans elaboration at lower levels, such as: spatial plans of regions, municipalities and the City of Skopje, as well as urban plans for the purpose of providing planning conditions for their proper protection, exercise of their cultural function, spatial integration and active use of monuments of culture for the relevant purpose in tourist industry, small-scale business and services, and in the overall economic development of the country;

– Harmonization of methodology, criteria and procedure for immovable cultural heritage valorization among bodies and organizations holding responsibility for their protection, for the purposes of classification, categorization and placement under specific regime of protection for the most significant registered and recorded monuments;

– Planning of the reconstruction, revitalization and conservation of the most significant monumental complexes and buildings, and organization and development

of contact, surrounding monumental area, for the purpose of preserving their cultural and historical dimensions and appropriate presentation;

– Amendment and supplementing existing spatial and urban plans for the purpose of their adjustment to immovable cultural heritage protection requirements.

Within the above proposed efforts, one of the main goals should be to harmonize and adopt unique methodology, criteria and procedure for immovable cultural heritage valorization.

Planning determinants

Planning of the protection of immovable cultural heritage is indivisible part of the planning of economic, social and spatial development of individual areas, as well as of the country as a whole, and within such frames, part of spatial and urban planning.

Through immovable cultural heritage protection planning, spatial and urban plans formulate the long-term policy of the spatial development of the country and local self-government in this area.

According to the Law on Spatial and Urban Planning, urban plans stipulate planning measures for building heritage protection.

Planning of the space organization, development and use, cities and populated places development, and development of other areas intended for residential and other complex building, which is the main function of spatial and urban plans, should incorporate the aspect of immovable cultural heritage protection.

This means that the immovable cultural heritage, whether building complex or individual building, as common global cultural wealth, should be treated in spatial and urban plans in a manner that will provide for its successful integration in the spatial and organizational tissue of cities and populated places and wider areas, and stressing its building, shape related and aesthetic values.

The Law on Spatial and Urban Planning and the Rulebook on the content and manner

* Moslem religious building

of graphical processing of plans and the procedure for spatial and urban plans adoption (official Gazette of the Republic of Macedonia No. 4/96, 8/96 and 18/97) stipulate the obligation for all types of spatial and urban plans to contain planning measures for the building heritage (monuments of culture) protection, while detailed urban plans bear the obligation of stipulating appropriate treatment of the monuments of culture as part of the building heritage.

The above implies that information and documentation basis of the plans should include analysis and documentation of immovable cultural heritage current status and valorization within the planning scope, as basis for its classification, categorization and determination of the relevant protection regime.

Documentation of immovable cultural heritage should contain in particular:

- Inventory of immovable cultural goods;
- Cultural heritage classification;
- Cultural heritage categorization;
- Status of threats against cultural goods and reasons thereof;
- Guidelines for determination of protection regime, with specific conditions, in accordance with the Convention on Cultural Goods Protection in Case of Armed Conflict;
- Guidelines for planning treatment and measures for cultural goods protection.

Data on the status, inventory with classification, valorization with categorization and guidelines for protection regime determination for the immovable cultural heritage, are provided by the competent expert organizations in the domain of protection, in accordance with the criteria applicable in valorization, as stipulated by regulation. If such criteria have not been stipulated, generally accepted scientific criteria will apply (scientific valorization).

Documentation on immovable cultural heritage also contains socio-economic and cultural and historical conditions for the development of the area on which the plan is

developed; census of cultural goods, indicating in particular the determined categorization and protection regime of proclaimed and proposed for proclamation cultural goods (monuments of culture); extent of threat against cultural goods and reasons thereof.

The regime of monuments of culture protection, and of the immovable cultural heritage within that frame, is based on the Law on Monuments of Culture Protection, according to which the competent state body or organization prescribes the protection regime and measures, by means of decision for determination of the status of monument of culture.

In the field of cultural heritage protection in the Republic of Macedonia, several ratified international conventions apply, such as: Convention on Cultural Goods Protection in Case of Armed Conflict (1954 Hague Convention), Conventions on Measures for Prohibition and Prevention of Illegal Import, Export and Ownership Transfer of Cultural Goods (1970), Convention on the World Cultural and Natural heritage Protection (1972), European Convention on Archeological Heritage Protection (1969) and Convention on Architectural Heritage of Europe Protection (1985).

According to the said laws and conventions, protection regime and measures for immovable cultural and historical heritage are prescribed in accordance with the methodology of spatial and urban planning, implying cooperation among bodies and organizations competent for cultural heritage protection at the level of their drafting.

One of the main goals of the above process is to harmonize and formulate unique methodology, criteria and procedure for immovable cultural heritage classification, valorization and categorization.

The concept of organization of spatial or urban agglomeration, incorporated in the draft and the proposal of the spatial or the urban plan, should in terms of immovable

cultural heritage protection determine and specify:

- Protection zones of monumental complexes and individual monuments, with differentiated protection regime;

- Contact zones (critical perimeter) for individual monuments, defining the relationship between old and new contents, through specific building conditions in certain sub-zones;

- Proposal for revitalization of the most prominent monumental complexes and monumental buildings, by proposals for their use and integration into the spatial organization;

- Zones reserved for future archeological investigations.

On the basis of the relevant documentation on immovable cultural heritage, spatial and urban plans have the obligation to specify: planning measures for their protection, as well as guidelines for defining the regime of protection for individual cultural goods and their complexes.

The guidelines on protection, contained in spatial and urban plans, apart from planning measures for the immovable cultural heritage protection, may also indicate the need for adoption of lower level plans with regard to certain parts with exceptional cultural values, such as detailed urban plans or urban designs, as well as designs development for the purposes of restoration and remedy.

5.4. TOURISM DEVELOPMENT AND TOURIST AREAS ORGANIZATION

Current status

Taking into account the available natural, spatial, market, communication and other conditions, we may state that the development of tourism in the Republic of Macedonia in the past decade has not been satisfactory and levels achieved in all types of tourist possibilities lag behind real absorption capacities and potential tourist demand. In the course of the last five years, as a result from political and economic

circumstances in the region of the Balkans, we have experienced a stagnation, and even decrease in tourist trade, especially in the segment of foreign tourism. This has further accelerated the formerly existing decreasing trend in tourist industry growth in the country. Thus, instead of rapid growth of tourist industry projected for the period 1985 - 2000 (increased number of beds for five times and increased number of overnight stays for seven times), there was stagnation posing threat to tourist industry that it might be positioned at the margins of the economic development of the country.

The above mentioned trends reflect in the number and structure of beds in accommodation facilities, which was 74.130 beds in 2001.

The existing state may be described as follows:

- The current structure of accommodation facilities is unfavorable. The share of primary in the total accommodation facilities is 40%, while complementary accommodation facilities participate with 60%.

- Facilities for tourist accommodation and food provision may be assessed as satisfactory, bearing in mind the scale of the current effective tourist demand, and its seasonal nature. However, the structure of facilities is not satisfactory in terms of the level of equipment, structure of offer and quality of service.

- According to facilities distribution, lake areas are dominant, where 80.5% of all facilities are located, followed by the City of Skopje with 6.3%, mountainous resorts with 4.7%, spas with 2.7% and other – 5.9%.

- Observed by municipality, the dominant position belongs to the former Municipality of Ohrid with 35.9%, then Struga with 20.8%, Resen 11.9%, Gevgelia 10.0%, Skopje-Centar 4.7%, Gostivar 3.1%, Bitola 1.9%, Gazi Baba-Skopje 1.8% and Tetovo 1.6%, while other former municipalities participate with 18.2% in the total accommodation facilities.

– Among hotel facilities, lower classes and several bedrooms accommodation is predominant, and there is no single extra class hotel in the country.

Goals

– Comprehensive valorization of natural and man-made potentials for tourist offer, both for foreign and domestic tourism, differentiated by tourist values and contents, in line with the trends of international and domestic tourist demand;

– Definition of tourism types to be developed in specific areas, depending on spatial and other development factors, by achieving optimum in tourist offer specialization;

– Definition of relationships and interdependence among individual tourist spatial entities and other areas and spatial units, within the national territory and beyond;

– Determination of the main directions of development and areas that need to be protected for the purposes of tourism, and definition of the infrastructure required for their development;

– Through tourism re-organization, identification of areas with priority importance for tourism growth, and determination of the principles of building in this context;

– In relation to tourist demand, mobilization of new areas with outstanding natural or man-made tourist values, representing at the same time guiding development factors, especially in underdeveloped areas;

– Identification of possible collisions between tourism and other economic activities in certain areas, balancing of their mutual impacts and definition of priorities of development and facilities allocation;

– Protection and re-valorization of areas suitable for tourism development, their planning in terms of tourism and urban development and integration of facilities in the natural or historical ambient, through full application of criteria and standards for the

protection of environment, natural and cultural heritage;

– Through spatial organization of tourism, besides its basic economic function, stimulation of social health, cultural and educational functions, as well as promotion of conditions for daily, week-end and holiday recreation of the local population;

– While projecting accommodation facilities, the principle of complexity of offer should be observed, its territorial and time adjustment to the demand, as well as acquisition of greater economic effects through lower investments.

Planning determinants

On the basis of comprehensive analysis of existing natural and man-made conditions and resources, the following types of tourist resources may be distinguished by scale, quality, distribution or uniqueness, functionality, attractiveness and extent of attractiveness on the national territory: water resources, mountains, spas, areas and goods possessing natural and cultural heritage, tourist transit routes, urban settlements, hunting sites and villages.

Considering the above resources and defined tourist sites therein, there are favorable conditions for development of the following types of tourism: bathing (lakes); mountain – winter sports; mountain – climate curative; spas; hunting; transit.

On the basis of the main long-term goals, concept and criteria for tourist offer development and organization, 10 tourist regions have been identified in the country, with 54 tourist zones, namely: 1. Skopje-Kumanovo with 8 zones, 2. Sara-Polog with 4 zones, 3. Kicevo-Brod with 2 zones, Mavrovo-Debar with 4 zones, 5. Ohrid-Prespa with 7 zones, 6. Pelagonia with 8 zones, 7. Middle Vardar with 6 zones, 8. Strumica-Radovis with 4 zones, 9. Bregalnica area with 8 zones and 10. Kratovo-Kriva Palanka region with 3 tourist zones. Within the said regions and zones, there are 200 tourist sites, among which 34 are defined for activities on snow, 47 for water related activities, 80 in natural and

historical surroundings, 9 – spas, 29 urban links.
 tourist resorts and 4 – main transboundary

Regionalization of tourist areas – 2020

Table 39

<i>Tourist region</i>	<i>Tourist zone</i>	<i>Tourist resorts</i>
Skopje-Kumanovo region	Urban tourist resort	Skopje
	Vodno-Matka	Vodno
		Matka
		Kozjak
	Kitka-Karadzica	Patiska reka (river)
		Karadzica
		Kitka
	Oresani-Zelenikovo	Zelenikovo
	Skopska Crna Gora	Ljubanci
		Brodec
	Katlanovo-Badar	Katlanovo Spa
	Pcinja river zone	Kumanovo
		Kumanovo Spa
		Tabanovce
		Pelince
Matejce-Lipkovo	Lipkovo	
	Matejce	
Sara-Polog region		
	Ljuboten-Tri vodi	Vratnica
		Ljuboten
		Pribeg
		Tri Vodi
	Tetovo-Popova Sapka-Lesnica	Tetovo
		Popova Sapka
		Crn Vrv
		Lesnica
	Gostivar-Vraca-Nicpurska planina	Gostivar
		Bristovec
		Bogovinje Lake
		Rudoka
		Mazdraca
		Nicpurska pl.
Mavrovo-Debar region	Mavrovo zone	Mavrovi Anovi
		Mavrovo
		Bunec
		Leunovo
		Nikiforovo
		Straza
	Radika-Debar zone	Trnica
		Galicnik
		Silo Verte
		Sv. Jovan Bigorski
		Lazaropole
	Kosovrasti-Debar Lake-Banjiste	Debar
		Kosovrasti Spa
		Banjiste
		Debar Lake
Gari-Golem Rid	Stogovo-Golem Rid	
Kicevo-Brod region	Kicevo zone	Kicevo
		Krusino
		Sv. Precista
		Lopusnik
		Izvor
	Brod zone	M. Brod

		Pesna	
		Buseva cesma	
		Belica	
		Samokov	
Ohrid-Prespa region	Jablanica zone	Globocica Lake	
		Tasmarunista	
		Labuniski Bacila	
		Jablanica	
		Gorna Belica	
		Vevcani	
	Struga zone	Struga	
		Radozda	
		Livadiste	
		Elen Kamen	
		Kalista	
		Evrotel	
		Struga west	
		Kjafasan	
	Debarca zone	Slatino	
	Ohrid zone	Ohrid	
		Andon Dukov	
		Gorica	
		Velesovo	
		Sv. Stefan	
		Lagadin	
		Konsko (Belvi)	
		Elesec	
		Pestani	
		Gradiste	
		Trpejca	
		Ljubanista	
		Sv. Naum	
		Galicica	Magaro-Galicica
			Stara Galicica
	Resen-Otesevo-Konsko	Resen	
		Konsko	
		Stenje	
		Otesevo	
		Carina	
		Sir Han	
	Resen-Krani-Dolno Dupeni	Asamati-Pretor	
		Krani	
		Strbovo	
		Nakolec	
		Dolno Dupeni	
Pelagonia region	Bitola-Pelister zone	Bitola	
		Marusica	
	Kopanki-Siroka	Begova -Kopanki	
		Livada	
		Siroka	
	Nize Pole-Neolica	Nize Pole	
		Neolica	
	Strezevo zone	Strezevo	
	Mariovo zone	Kajmakalan	
		Staravina	
	Demir Hisar zone	Demir Hisar	
		Smilevo	
		Gorno Ilino	
		Prilep	
	King Marko's Towers -Zlatovrv-Pletvar	Varos- King Marko's Towers	
		Zlatovrv	

		Mukos
		Zrze
		Pletvar-Livada
	Mariovo zone	Vitoliste
	Krusevo zone	Krusevo
		Krusevo-ski-centre
		Buseva Planina
		Sv. Spas
		Meckin Kamen
Middle-Vardar region	Veles zone	Veles
		Mladost Lake
		Gradsko
		Klisura Pesti
	Golesnica-Jakupica zone	Breza
		Gorno Jabolciste
		Ceples (Nezilovo)
	Tikves	Negotino
		Stobi
		Demir Kapija
		Kavadarci
	Tikves Lake.-Vitacevo-Kozuf	Tikves Lake
		Mihailovo
	Gevgelia zone	Gevgelia
		Negorci Spa
		Smrdлива Voda
		Vardarski rid
		Bogorodica
	Valandovo -Dojran	Valandovo
		Nikolic
		Acikot
		Nov Dojran
		Star Dojran
		Mrdaja
Strumica-Radovis region	Strumica zone	Strumica
		Vodoca
		Bansko
		Smolari
	Turija-Ograzden	Turija Lake
		Asebalica
		Varvarica
	Mantovo zone	Mantovo
	Western-Plackovica zone	Kozbunar
		Sipkovica
		Children's rest home
		Radovis
Bregalnica region	Plackovica zone 1	Mountain house
		Turtel
	Stip-Kezovica-Kr. Lakavica	Stip
		Kezovica
		Kr. Lakavica
	Plackovica zone 2	Vinica
		Blatec
		Lisec
		Goten
	Malesevo	Berovo
		Pehcevo
		Berovo Lake
		Ablanica
		Breza
		Suvi Laki
	Pijanec	Delcevo
		Kalimanci Lake

		Golak
	South Osogovo zone	Kocani
		Banja
		Gradce Lake
		Pantelej
		Ponikva
	Plackovica zone 3	Zrnovci
	Probistip zone	Probistip
		Lesново
	Sveti Nikole zone	Sv. Nikole
		Guriste
		Bogoslovec
Kratovo-Kr.Palanka region	North Osogovo zone	Kr. Palanka
		Sv. J. Osogovski
		Kalin Kamen
		Deve Bair
	West Osogovo zone	Kratovo
		Lisec
		Bukovec

On the basis of explorations conducted so far, existing material resources and results acquired in the past period, and taking into account the projected tourist turnover and expected foreign exchange income, while observing the relevant indicators of overall tourist values and other comparative advantages, it would be realistic to expect that the Republic of Macedonia reaches the end of the planning period (2020) with total of 110.000 beds, available in all types of accommodation facilities, which means 48% growth compared to 2001 (74.130 beds).

The number of overnight stays in 2020 will reach 7.500.000, out of which 5.250.000 domestic and 2.250.000 foreign tourists. Compared to the average in 1984-85, total overnight stays will rise for 2.4 times, where domestic tourists will increase for 1.9 and foreign for 5.5 times.

On the basis of the projected number of foreign tourists and expected over-night stays thereby, Republic of Macedonia expects to acquire a foreign exchange income of US\$ 350 million, by the end of the planning period (2020).

Projected allocation of accommodation facilities is presented in the table bellow.

Projected facilities (beds) and their spatial allocation by tourist regions and areas in 2020
 Table 40

Tourist region/area	Projected facilities 2020	
	beds	%
1. Skopje-Kumanovo	11.000	10.00
1.1. Skopje	10.000	9.09
1.2. Kumanovo	1.000	0.91
2. Sara-Polog	2.100	1.91
2.1. Tetovo	2.100	1.91
3. Mavrovo-Debar area	5.000	4.55
3.1. Gostivar	4.000	3.64
3.2. Debar	1.000	0.91
4. Kicevsko-Brod area	370	0.34
4.1. Kicevo	250	0.23
4.2. Brod	120	0.11
5. Ohrid – Prespa	71.000	64.55
5.1. Struga	21.000	19.09
5.2. Ohrid	37.000	33.64
5.3. Resen	13.000	11.82
6. Pelagonia	4.100	3.73
6.1. Bitola	2.500	2.27
6.2. Demir Hisar	100	0.09
6.3. Prilep	400	0.37
6.4. Krusevo	1.100	1.00
7. Middle Vardar area	13.280	12.07
7.1. Veles	1.100	1.00
7.2. Negotino	800	0.73
7.3. Kavadarci	300	0.27
7.4. Gevgelia	11.000	10.00
7.5. Valandovo	80	0.07
8. Strumica – Radovis area	1.020	0.93
8.1. Strumica	820	0.75
8.2. Radovis	200	0.18
9. Bregalnica	1.750	1.59
9.1. Stip	350	0.32
9.2. Vinica	120	0.11
9.3. Berovo	200	0.18
9.4. Delcevo	400	0.36
9.5. Kocani	450	0.41
9.6. Probistip	120	0.11
9.7. Sveti Nikole	110	0.10
10. Kratovo – Palanka area	380	0.35
10.1. Kratovo	180	0.177
10.2. Kriva Palanka	200	0.18
Republic of Macedonia - total:	110.000	100.00

ploughland and gardens of 6, 7 and 8 class, with relatively notable erosion, into forest land area.

6. BALANCE OF LAND AREAS PURPOSE

Changes in land use balance result, before all, from change in the structure of productive land areas, in order to adjust the land use with natural conditions, to protect pedological ground from intensive erosion and to prevent space devastation. Primary transformation planned by 2020 includes change in land use over 96.000 ha agricultural land, which are currently uncultivated land areas and abandoned

The Plan by 2020 envisages that areas under productive use (utilized by primary sector) to amount 2.335.000 ha, or increase by 94.000 ha, (4%) compared to current areas. In the framework of productive land use, the largest area will be used as agricultural land with 1.196.000 ha, or 46.5% of the total territory of the Republic of Macedonia, or 51.2% of the productive land area, while forests and forest land will

occupy 1.140.000 ha, or 48,8% of the total productive area.

Areas under forest and forest land will increase from current 997.000 ha to 1.140.000 ha or the increase will be by 14%, thus reaching a share of 44.3% in the total national area. In the context of increase in areas under forest by 2010, forestation has been planned over 79.220 ha, and by 2020, over 70.780 ha, or total forests expansion with 150.000 ha new afforested areas. In addition, the total area under forest and forest

land will include abandoned agricultural land, which are by their natural characteristics suitable for future reforestation by way of natural succession or artificial forestation. Intensity of forests erection will depend on financial ability of the country, thus full completion may be transferred in the post-planning period as well. The total forest land under forest in 2020 will amount 1.039.560 ha, or forest share of 40.4%, or increase of 4% compared to the status in 2001.

Balance of land areas by land categories and crops in 2020

Table 41

	Year	000ha	%	%	%	%
Total area	2001	2571	100			
Unproductive land area	2001	330	12.8			
	2020	236	9.2			
Productive land area	2001	2241	87.2	100.0		
	2020	2335	90.8	100.0		
Forests and forest land area	2001	997	38.8	44.5		
	2020	1140	44.3	48.8		
Agricultural land area	2001	1244	48.5	55.5	100.0	
	2020	1196	46.5	51.2	100.0	
Pastures	2001	630	24.5	28.1	50.6	
	2020	625	24.3	26.8	52.2	
Swamps, caned areas and fish ponds	2001	2	0.1	0.1	0.2	
	2020	1	0.0	0.0	0.1	
Arable land areas	2001	612	23.8	27.3	49.2	100.0
	2020	570	22.2	24.4	47.7	100.0
Ploughlands and gardens	2001	512	19.9	22.8	41.2	83.7
	2020	440	17.1	18.8	36.8	77.2
Orchards	2001	17	0.7	0.8	1.4	2.8
	2020	30	1,2	1,3	2,5	5,3
Vineyards	2001	28	1,1	1,3	2,3	4,5
	2020	40	1,6	1,7	3,3	7,0
Meadows	2001	55	2,1	2,5	4,4	9,0
	2020	60	2,3	2,6	5,0	10,5

The planned decrease in agricultural land area from the current 1.244.000ha to 1.195.000 ha in 2020 derives from the above mentioned change in the use of part of the areas under fallows and uncultivated land of low production quality (low rating value, unsuitability for mechanization use and advanced erosion processes) into forest land areas. However, changes in land use are conditioned by prior definition and division of areas throughout the country, through specific programme developed by the competent state institutions. The said areas

will continue to be used as agricultural areas, mostly as pastures and low-productive meadows, with planned determination to transform them into forests in future. Therefore, such areas have been excluded from the balance of agricultural land, although previously analyzed under agricultural land use.

Qualitative changes have been envisaged in the structure of arable land use. Areas under pastures, with minor reduction by 5.000 ha, will remain at 625.000 ha, thus holding a share of 24.3% in the total national

area, and 52.3% in the total agricultural land area (1.195.000 ha). Arable land areas will decrease from 612.000 ha in 2001 to 570.000 ha in 2020 or by 42.000 ha. Except with ploughland and gardens, other crops have been envisaged for growing over increased areas by 2020, namely with orchards by 76%, with vineyards by 30% and with meadows by 10%. In fact, there will be no real decrease in the areas under ploughland and gardens, as 35% of those areas have not been planted (for different reasons). In the structure of ploughland areas, grains will remain dominant in share (53%), with minor increase of 11.000 ha, areas under industrial crops will increase from 38.000 ha to 70.000 ha, areas under vegetables from 61.000 ha to 70.000 ha and forage crops will increase from 37.000 ha to 65.000 ha. The use and the purpose of arable land areas defined in the above manner, and the use of ploughland areas and gardens in that context, represents an optimal adjustment of agricultural production with natural advantages of the space, where areas under intensive crops will increase from the current 110.000 ha to 185.000 ha.

Out of the gross area suitable for irrigation (370.850 ha), irrigation systems by the end of the planning period will cover 267.762 ha, or 47% of the arable land areas (570.000 ha), through existing systems reclamation and rehabilitation, their extension to cover 33.368 ha and new systems development for an area of 106.342 ha.

In the period by 2020, development of drainage systems for 3.500 ha additional areas has been planned (Polog-300 ha; Kicevo-600 ha; Pcinja-900 ha; Middle Vardar-300 ha; Lower Vardar- 800 ha and Struga fields -600 ha).

Protected areas as natural rarities or parts of nature hold specific position under the land use. In 2020, such areas will occupy 298.566 ha, or 11.6% of the national territory, including the five national parks (Pelister, Galicica, Mavrovo, Jakupica and Sar Planina).

The total area under unproductive land in 2020 is projected to reach 236.000 ha, or 9.2% of the territory of the Republic of Macedonia.

Balance and structure of unproductive land purpose- 2020

Table 42

Year	ha	%
Waters and water courses	55.000	23.3
Natural lakes	43.410	18.4
Religious buildings	1.300	0.6
Roads and railways	38.000	16.1
Settlements	65.000	27.5
Other barren land	33.290	14.1
Total:	236.000	100.0

The structure of unproductive land purpose is dominated by waters, namely waterways, natural and man-made accumulations. Taking into account the number and the scale of the planned man-made accumulations (23 large and around 100 small), the area under waterways and accumulations in 2020 will amount 55.000 ha, or increase by 11.000 ha. New areas to be occupied by accumulations will be mainly unproductive land areas, namely rocky terrains, river beds and lands under low trunk forests and underbush.

Areas under settlements, construction and industrial buildings will occupy 65.000 ha, or 27.5% of the total unproductive land area, or 2.5% of the national territory. Increase by 30.000 ha compared to current 35.000 ha is due, before all, to the integration and legalization of illegally constructed buildings in the vicinities of major cities (more than 100.000 buildings) and extension of building range in some populated places, mostly centres of newly established municipalities. The development of urban centres will be oriented towards utilization of land areas within the boundaries of the current building ranges. Development of industry and small-scale business will be carried out within current industrial zones, too, or on areas reserved for that purpose under the existing urban planning documentation.

7. PROTECTION AGAINST WAR DESTRUCTIONS, NATURAL DISASTERS, INDUSTRIAL AND TECHNOLOGICAL ACCIDENTS

7.1 GUIDELINES FOR PROTECTION AGAINST WAR DESTRUCTIONS

The most significant change in the structure of unproductive land area will be related to the category “other fertile land”, including rocky areas, extremely sloppy terrains without vegetation, trenches and strongly eroded areas, canyon sides, etc. These areas will note decrease by 67.710 ha due to changed use into areas under accumulation, forestation and transport infrastructure and will amount 33.290 ha. Out of the category of rocky terrains and fertile land, 22.000 ha are situated within forests and forest land areas and have not been included in the category of total unproductive land.

Use and exploitation of mineral resources is carried out, mostly, through underground mines, except coal exploitation, where major surface excavations are practiced and planned (Suvodol-Bitola area, Brik-Berovo, Oslomej-Kicevo and Piskupstina-Struga). These mines occupy mainly agricultural land areas, transforming them temporarily into unproductive agricultural land, which should be transformed in forest land in the post-exploitation period, through rehabilitation or grass cover restoration. Similar transformations take place with non-metal mines during mineral resources exploitation, but subject areas occupy mainly low-productive pastures or forest with low timber increment.

From geo-strategic point of view, the territory of the Republic of Macedonia has many specific, mostly unfavorable, military strategic features, owing to its relatively small area, surrounding of territories of four countries and in-dept exposure at modern war activities.

On the other side, the limited area, the complex relief (mainly mountainous) structure, cross-cut by gorges and river valleys, may to a great extent eliminate material or technical superiority of potential aggressor.

On the basis of the assessment and valorization of several factors (natural, military and urban) determining the extent of threat in a given area within the territory of the Republic of Macedonia, five areas have been conditionally determined by extent of threat:

1. Areas at maximum extent of threat – core and suburban area of the City of Skopje, capital of the Republic of Macedonia, in which 26% of the population, 40% of industry, 38% of social product and employees and 45% of capital assets are concentrated. Therefore, in a possible war, the City of Skopje would suffer huge destructions, explosions, fires, intoxications from chemical industry and major human losses.

2. Areas at high extent of threat – areas that would fall within the range of strategic directions of aggressor's attack, in case of a war. Such directions correspond with natural communication corridors, within which the most developed physical structures are concentrated and the density of population is at highest level. Therefore, in case of a war, high extent of physical structures, people and material goods could be expected in these areas.

3. Areas threatened by durable war activities – all cities and major populated places situated within zones of high extent threat. In these areas, durable military activities will be conducted in populated places, around important transportation connections and other strategic points, aimed at their

occupation. Therefore, they will be exposed at constant destructions and rapid changes of military conditions.

4. Indirectly threatened areas – hilly and mountainous and sub-alpine areas, situated close to areas under high threat extent (the former are not exposed at military actions directly) or close to areas suitable for establishment of free territories, which makes them appropriate for forced and temporary stay of military units, evacuated population, etc.

5. Areas suitable for establishment of free territories, which due to their natural properties are hardly accessible for armored units, outside urban agglomerations and communications and the routes of attacking. Owing to low population density and insufficient development level, these areas are of low vulnerability, which makes them suitable for establishment of free territories. At the same time, these areas, constituting more than 50% of the national territory, due to their geographical, morphological and geo-strategic properties, represent natural defense bastions, enabling efficient organization of defense.

Considering the assessment of the extend of threat posed to certain segments of the national territory by possible war activities, one may conclude that greatest destructions will be noted in the City of Skopje and other cities and populated places, which means that the highest number of victims will be among civilian population, which has actually been the case in all past wars, both on global and local level.

Therefore, the policy of population protection against war destructions through spatial and urban planning should focus in two basic segments:

- Planning and development of areas suitable for population and material goods evacuation;

- Planning of safe areas and settlements where evacuated population and material goods will be accommodated;

- Planning, construction and adaptation of protective facilities and locations for trenches and shelters development;

- Planning of additional locations for killed and dead population burial;

- Locations for dead animals burial;

- Locations for destruction waste disposal in case of intensive building damages;

- Locations for harmful and hazardous matters storage and destruction.

In order to achieve the appropriate level of protection of evacuated population and undertake activities aimed at preparing and equipping the areas suitable for evacuation, such areas should be selected from among indirectly threatened areas, as well as among areas suitable for establishment of free territories.

Favorability of indirectly threatened areas is expressed through indirect effects of military means used in adjacent threatened areas (radioactive or chemical agents, fires, floods, etc.). In defense planning and spatial plans drafting, these areas should be reserved for forced and temporary stay of evacuated local population and military units. Spatial planning and other development and defense measures should envisage dispersed processes of production functions, technical (communication and energy) infrastructure and necessary investment

activities for rapid enabling of such local communities for living in war conditions.

Favorability of areas suitable for establishment of free territories, constituting more than 50% of the national territory, appropriate for accommodation of evacuated population, noted also in evacuation plans, should be observed as areas of regional and national importance, in which, under war conditions, evacuated population will carry out the production of food and other necessary products for defense and survival.

According to the optimal model for space utilization in war conditions, areas suitable for free territories and for evacuation of the population from the most threatened areas of the country are at the same time defense zones or bastions, where it is possible to organize production, governance and other public functions, adapted to war circumstances.

Spatial plans of regions, national parks, area of the City of Skopje and municipalities, measures of economic policy should envisage in these areas development of tourist and recreation facilities, weekend settlements, revitalization of abandoned villages, agriculture and livestock development, allocation of small scale industrial and other manufacturing facilities, development of the necessary infrastructure and other activities, encouraging the overall spatial dispersion of functions, as sustainable development and defense strategy.

The obligation for planning and development of shelters for the purpose of the population protection against war destructions, as part of residential, industrial, commercial, public and other types of buildings is regulated in several laws and regulations, such as: Law on

defense, Law on Spatial and Urban Planning, Law on Investment Building, Decree on Criteria for Population Sheltering, Rulebook setting the level of funds required for shelters construction and manner and term of funds payment and repayment and Rulebook on the contents and manner of graphical elaboration of plans and manner and procedure for spatial and urban plans adoption.

Provisions of the Law on Spatial and Urban Planning stipulate the provision by which spatial and urban plans contain planning measures for protection against war destructions, assuming analysis of the status of shelters and their urban scope valorization thereof; estimates of the extent of threat in certain local urban structures, based on the general assessment and zones of threat in the country, and formulation of future policy in accordance with identified needs (and specific locations) for new shelters construction. This obligation is still in force and should be observed in plans development processes.

It should be noted that the annulled obligation for investors of residential and other buildings, in terms of construction of individual shelters or payment of charges for shelters construction, should be considered as temporary, applied in order to stimulate construction activity. This can re-affirm the concept of collective shelters construction in multi-purpose buildings, through multi-purpose use of collective sheltering premises for commercial purposes. Their construction could be financed by non-budgetary resources.

Within the current conditions of non-redefined policy of population sheltering from war destructions, it is necessary to establish utmost

cooperation between bodies competent for defense and civil protection, for the purposes of assessing the extent of threat from war destructions, definition of planning measures for population protection and evacuation, formulation of the concept of shelters planning and construction, determination of specific locations and definition of minimum building requirements.

7.2. PROTECTION MEASURES AGAINST NATURAL DISASTERS

-Protection against strong earthquakes

Seismic phenomena – earthquakes – are the dominant natural disasters in the Republic of Macedonia that may have disastrous consequences on people and nature. Earthquakes have been present through centuries on 10 seismic focus areas in the country or its close and wider surrounding. Earthquakes with moderate magnitudes ($M < 6.0$) may cause severe destructions, because traditionally built structures, especially in rural areas, cannot resist such earthquakes without major destructions. An example of this is the 1990 earthquake in Gevgelia, which caused damages to 1.120 buildings and 1994 earthquake in Bitola that caused damages to 4.300 buildings. Potential earthquakes in the seismic zones Pehcevo-Kresna ($M = 6.9-7.8$) could cause greatest destruction effects experienced so far on the Balkans and in Europe.

From spatial point of view, areas prone to highest seismic influences include areas of Debar, Skopje, Ohrid, Berovo, Kocani, Delcevo, as well as the area between Gevgelia and Demir Kapija. Areas of exceptionally great seismic danger are Valandovo and Pehcevo, where the strongest

earthquakes on the territory of the Republic of Macedonia occurred, within (M=6.7) and (M=7.8) magnitudes.

Areas exposed to lowest seismic activity, i.e. with slight indigenous seismic activity, are the areas within Pelagonia horst, Jakupica massif, Selecka Mountain, Ograzden-Plackovica horst, Osogovo and German horst and other areas.

Historical data indicate that strong earthquakes on the territory of the country were followed by occurrence of collateral hazards (liquefaction, rockslide, earth slides, fissures, clefts, ground displacement), dominated by rockslides and earth slides, deteriorating further the impacts of earthquakes.

Within the past spatial development of the country, development and planning of the national territory have been guided by natural resources, geographical, morphological and other favorable conditions, rather than seismic risks. This has created conflicting state where major cities, most of the population, industrial facilities and most relevant communications like north-south and west-east corridors have been located in zones of highest seismic potential (intensity of 8-10 degrees at MSK-64).

In the above described constellation of supra- and infrastructure on the area of the Republic of Macedonia, seismic risk can be reduced only through application of appropriate economic measures for man-built values protection (building intervention in carriage construction of existing buildings for the purpose of adding resistance against strongest earthquakes) and mandatory enforcement of the relevant legislation regulating procedures, conditions and requirements for the purpose of achieving technically

consistent and economically sustainable level of seismic protection with new buildings construction.

After the disastrous earthquake in 1963, aseismic building and seismic protection have taken priority among technical regulations in the domains of designing and building. In the past 35 years, norms have been modified and improved to reach a high quality level at present. However, in order to provide protection for the space, environment, population and man-built values, it is necessary to undertake comprehensive review of the legislation and set modern criteria for building in seismic areas.

One of the priority measures is the review of the current Rulebook on technical norms for building design and construction in seismic areas (Official Gazette of SFRY No. 31/81, 49/82, 29/83, 21/88 and 52/90), as well as Rulebook on technical norms for remedy, reinforcement and reconstruction of building structures damaged by earthquake and reconstruction and revitalization of building structures (Official Gazette of SFRY No. 52/85).

Investment projects should elaborate protection measures focused on people, material goods and environment against natural disasters. Past investments should undergo cost-benefit analysis in order to define and integrate into the plan remedial measures for the current state.

Plans for protection against natural disasters should be updated regularly, and such plans exist by law for the whole territory of the country due to the present seismic hazard, as well as exposure to other potential natural disasters.

Areas exposed to collateral hazards in parallel with seismic ones

should be subjected to detailed regionalization, as basis for application of protection measures in the process of spatial and urban planning.

In order to define the seismic parameters on the territory of the country, in terms of quality and quantity, it is necessary to increase the number of seismic stations and density of the network of instruments for earthquakes recording and to upgrade them.

Through the implementation of the above stated priorities, realistic conditions are established for efficient engineering prevention and reduction of seismic risk on the territory of the Republic of Macedonia, i.e. for efficient emergency management with regard to effects caused by strong seismic forces.

Protection against fires

Successful performance of the protection against natural disasters through the process of spatial and urban planning requires undertaking of appropriate protection measures in order to minimize possible human and material losses in case of fires.

According to the data presented by the Ministry of Internal Affairs, in 2000, on the territory of the Republic of Macedonia, 86 areas of forest fires were recorded, covering more than 50 ha. Highest number of fires has been recorded on the following mountains: Zeden, Jakupica, Golesnica, Babuna, Kozjak.

The planning process should take into account the terrain configuration, level of urbanization, extent of threat with fire and conditions favorable for fire occurrence, such as: climate and hydrological conditions, wind rose, etc.

In order to acquire higher level of protection against this kind of

phenomena, spatial and urban plans envisage series of measures aimed at avoiding the causes of fires, prevention of their spread, extinguishing and assistance providing in the efforts to overcome consequences from fires, concerning the following:

- water supply sources, public water supply network and water supply facilities providing sufficient quantity of water for fires extinguishing;

- distance between zones envisaged for residential and public buildings and zones envisaged for industrial buildings and special purpose buildings – storage of inflammable liquids, gases and explosive materials;

- distance between buildings for different purposes and structures resistance to fires inside industrial and residential zones and special purpose buildings;

- width, carrying capacity and propulsion of roads providing for access by fire brigade's vehicles to each building and their proper operation during fires extinguishing.

Protection against fires includes measures and activities of normative, operational, organizational, technical, educational and awareness nature, regulated in the Law on Fire Prevention (Official Gazette of SRM No. 43/86) currently under revision for the purpose of its approximation with the relevant directives of the European Union, and this is expected to result in improved legislation in terms of measures for fire prevention.

Protection against floods

In case of natural elements like floods, every organized society will undertake active and passive measures for organized defense. In order to make

rapid, proper and efficient decisions, it is necessary to have at disposal:

- Prior developed plan;
- Reliable information of the state of affected areas;
- Reliable broadcasting information on expected conditions.

Taking into account natural features and area use mainly for urban purposes, it is necessary to develop broadcasting models for:

- Area of Skopje with Kozjak accumulation;
- Area of Veles with Kozjak and Vakuf accumulations;
- Crna Reka up to its exit from Pelagonia;
- Kalimanci and Tikves accumulations;
- The system of Ohrid Lake-Globocica-Spilje.

In order to secure protection function on river network, it is necessary to:

- Project proper development through planning (spatial and urban) of areas potentially affected by floods in order to avoid major damages;
- Construction of accumulations ensuring flood wave retention ;
- River network area marking in cadastre maps and on the spot;
- Definition of inundations as public river areas;
- Regular monitoring of the status of river beds and intervention as required;
- Maintenance and restoration of the vegetation along river banks;
- Strict control of the status of river deposits;
- Initiation of the construction of stabilization thresholds for the purpose of river banks supporting and side erosion preventing;

- Initiation of the process of development and refining of degraded river beds (Vardar, Lepenec, Pcinja, Sateska, Bregalnica, Crna Reka);

- Maintenance and rehabilitation of existing systems for protection against flood.

The following activities have been envisaged with regard to certain major built defense systems in water management areas:

- Skopje water management area: protection system in Skopje was built to provide protection against high waters with probability of occurrence of once in 100 years, and the construction of “Kozjak” system will improve the level of protection at 300 years high waters. Areas downstream and upstream of Skopje are protected against 20 years high waters. This system requires revision and upgrading, in order to enhance the level of protection against higher than projected waters.

- Pelagonia: the basic network of the system was designed and developed for Crna Reka and certain major tributaries to receive 20 years waters and 10 years waters in other facilities. For the purpose of goods protection, Crna reconstruction process should be finalized to be able to receive 50 years waters and justifiability of the need to reconstruct other facilities should be re-examined, to enable it of receiving higher than projected waters.

- Struga-Ohrid area: water transfer from Sateska to Crn Drim river. For the purpose of water transferring of the Sateska River from Ohrid Lake to Crn Drim River, it is necessary to develop technical solution that will avoid Crn Drim’s bed filling with sand and Struga fields flooding.

Protection against other weather related disasters

Other meteorological phenomena with characteristics of natural disasters include events of hail, stormy winds and fogs.

In order to provide higher level and more efficient anti-hail protection, it is necessary to renew and modernize the existing three main and three auxiliary centres, and to finalize the network equipment to reach 300 anti-hail stations, their modern connection to the appropriate telecommunication links and equipment with new observation and reporting devices. The efficient and permanent connection to European Meteorological Organization and meteorological centres of neighbouring countries is of particular importance for timely defense against hail carrying clouds, for the purpose of activities coordination and phenomena monitoring.

Phenomena of stormy winds is most frequent in the areas of Ovce Pole and Pelagonia, where they may have negative impacts on agricultural crops, especially wheat and industrial crops. Therefore, erection of wind screens composed of perennial forest vegetation is necessary, especially with major agricultural holdings. Apart from communications, specific measure for protection against strong winds is the choice of vegetation with significant annual increment and sustainable at durable dry periods.

7.3. PROTECTION MEASURES AGAINST MAJOR INDUSTRIAL AND TECHNOLOGICAL ACCIDENTS

Protection measures against major industrial and technological accidents, apart from direct people and material goods protection, include emphasized environmental dimension. Environmental dimension of protection measures is based on the recognition that the environment is a limited resource, taken at the edge of sustainability in certain areas, and even at global level.

One of the possible and necessary preventive measures within the efforts for protection against major industrial and technological accidents, is the spatial and the urban planning, which have the task of creating friendly attitude towards environment, through identification and analysis of conditions and hazards of potential incidents and proper maintenance of installations and equipment. In this context, the main methodological space planning and development procedures include:

- Assessment of the state of natural components of environment and degree of threat of events of major industrial and technological accidents;
- Assessment of the burden on the space by technological systems of certain risk level;
- Analysis of mutual dependence of natural conditions and existing technological systems;
- Identification of the level of existing risk in everyday regular operations of technological systems and in case of emergency;
- Assessment of threat to people and material goods;
- Setting of criteria for best option selection, in terms of protection based on estimated threat level.

The application of the above methodological procedure may contribute to the achievement of the following goals of the protection against

major industrial and technological accidents:

- Maximum space adjustment and use by protection requirements meeting within the spatial possibilities;

- Integration of the measures establishing grounds for organization of protection and rescuing of human lives and material goods in case of major industrial and technological accidents into land use determination;

- Integration of threat elements into environmental issues.

In order to achieve full protection of people, material goods and closer and wider environment, there are three levels of safety and prevention measures undertaking:

First level: includes all measures related to equipment and installations maintenance, for the purpose of safe handling of hazardous materials in technological processes and avoidance of major technological accidents.

Second level: concerns all measures aimed at limiting emission in case of fire, explosion or chemicals release, that may occur in cases of major industrial accidents.

Third level: includes environmental protection measures in terms of restricting the effects from hazardous matters emission or consequences from fires and explosions.

On the basis of statements and conclusions deriving from the analysis of the conditions in the Republic of Macedonia, and possibilities for major industrial and technological accidents occurrence, elaborated by the Institute of Earthquake Engineering and Engineering Seismology, University of “St.Cyril and Methodius”, Skopje, as part of the expert study: “Possibilities for occurrence of and protection against major industrial and technological

accidents”, the implementation of the Spatial Plan of the Republic of Macedonia should take into account the following:

1. The need for establishing the system of major industrial accidents recording and analysis, compatible with the MARS system of the European Union, as basis for hazardous materials recording, involved in technological facilities and possible causes to major accidents.

The need to envisage preventive measures by industrial operators for the purpose of preventing technological disasters, based on the analysis of similar events in similar or identical plants.

The need to substitute the halogen hydrocarbons as cooling substances and propellers; reduction of the current emission of high number of hazardous substances by 50% and emission reduction of benzene, chloromethane, dichloroethane, copper and cadmium by 60-70%; emission reduction of carbon dioxide and dephosphatisation and denitrification of residual materials.

Development of appropriate plans and programmes for public protection and education and personnel training in case of potential industrial accident.

III. IMPLEMENTATION OF THE SPATIAL PLAN OF THE REPUBLIC OF MACEDONIA

1. GENERAL REMARKS

Taking into account the long-term nature of spatial planning, i.e. the fact that the long-term development process is expressed as permanent disturbance of existing balances and as tendency towards ongoing structural changes in the space, the Spatial Plan of the Republic of Macedonia defines the guidelines, the measures and the conditions, thus providing harmonization of the development of each element in the spatial system, in order to acquire dynamic and synchronized spatial development, permanent environment improvement and sustainable space use.

Determinants and solutions envisaged in this Plan will be operationalized through spatial plans for regions, municipalities and areas of public interest, as well as through urban plans of populated places. In order to achieve optimal correspondence between spatial and urban planning documentation at all levels, they should be harmonized with the Spatial Plan of the Republic of Macedonia, especially in the following domains: manner of space use and development, spatial distribution of the population and economic activities, concept of urbanization and system of settlements, spatial distribution of infrastructure systems, protection of the environment, natural values, and cultural and historical heritage.

The Plan includes flexible concepts and solutions for the national territory organization. It indicates the conditions and the possibilities for common development and the advantages of development harmonization over the whole national territory. In addition to this, the Plan contains clearly stated positions and concepts, too. Its

complex contents enables that all presented solutions be easily adapted to potential changes in future. Through it, the Republic of Macedonia acquires a tool for harmonization of its territory organization and development with the territories of neighbouring countries.

In accordance with the Constitution of the Republic of Macedonia, the Spatial Plan provides the following in the domain of the national territory organization and development:

- Establishment of favorable conditions for economic and social development;
- Harmonization of the development of economic and non-economic activities;
- Regulation of general conditions of the system of education and training, scientific activities, culture, physical culture, health and social welfare;
- Determination of basic regime of water, transportation and other infrastructure;
- Determination of the basic regime for living and working environment protection;
- Protection against aggressor;
- Development of underdeveloped areas.

2. HARMONIZATION OF PLANNING DOCUMENTATION WITH THE SPATIAL PLAN

All activities in the space should be harmonized with the guidelines of the Spatial Plan of the country, especially significant ones and those related to planning and building of the following:

- Major national infrastructure systems (roads, railways, air transportation, telecommunications);

- Major power systems, energy transmission lines and major water management systems;
- Building projects of importance to the State;
- Major tourist facilities;
- Major economic complexes (industry, terminals) and complexes related to high concentrations (free economic zones);
- Facilities for utilization of natural resources (land redistribution and change in space use).

The procedure for planning documentation adjustment and harmonization with the Spatial Plan is prescribed by the Ministry holding competence for the affairs of spatial planning, in cooperation with the Plan developer, providing for early inter-sectoral coordination and adjustment to the Spatial Plan determinants and guidelines.

3. DEVELOPMENT OF PRIORITY PLANS

Organization, development and use of areas and zones of special national interest and importance, as well as construction of facilities within such areas, will be carried out under direct control and upon approval by the competent public bodies and in accordance with the relevant legal provisions.

Spatial plans should be developed for the following areas of special interest:

- Corridor of the national transportation infrastructure (Corridor 8);
- Corridor of Vardar River (Corridor 10);
- Transboundary areas, provided that such areas are established with the neighbouring countries and joint approach to their development planning and guiding is applied;
- Tourist areas (Ohrid-Prespa and Dojran regions);
- Areas of accumulations for water supply, envisaged in this Plan;
- Areas with intensive surface exploitation of mineral resources (Bitola lignite basin);

- Areas the development of which is guided by specific national programmes;
- Wider protection zones around cultural, historical and natural resources specified by this Plan as monuments of international and national significance or wider areas incorporating major concentration of such resources;
- Regions: Skopje, Polog and Treska river basin.

The said plans should be developed in the period between 2003 and 2007.

4. PROVISIONS ON THE PLAN IMPLEMENTATION BY AREAS

- *Natural resources*

Agricultural land:

1.

Inventory of land areas registered under the category „fallows and uncultivated ploughlands” by municipalities, assessment of their quality and cost-effectiveness of agricultural production and distinction between high quality and low quality land areas.

2.

Development of programme (strategy) at the level of region – municipality on the manners, methods and level of funds required to activate high quality (favorable) land areas.

3.

Distinction at the level of region – municipality, between forest and agricultural land and presentation thereof as defined magnitudes (that should not be disputed) through spatial and urban plans at lower level.

4.

Adoption of programme for combating erosion on agricultural and forest areas, to identify sites, propose measures for protection against erosion, propose methods for measures enforcement, time of their implementation and estimate investments (funds) required for that purpose.

5.

Adoption of law or regulation for biological (natural, ecological) agriculture development, following the example of western European countries, in order to establish opportunities for certain producers to develop such production that will be protected on the market, as well as to protect consumers from quazi-producers of biological food.

6.

Adoption of regulations to prevent further agricultural land splitting, encourage association and consolidation, adopt modern law on agricultural cooperative movement in market economy conditions, etc..

7.

Development of national programme for livestock promotion, establishment of reproduction centres for high-quality natural heads generation and construction of slaughterhouse for poultry and facilities for eggs processing.

8.

Agriculture stimulation through financial and credit support aimed at development of modern agricultural systems and all types of agricultural businesses, marketing, subsidies, protected prices, recourses, guaranteed prices, credit based recourses for sorted seeds, mineral fertilizers and protection means, thoroughbred cattle heads, guaranteed prices and protection customs duties for products noting deficit on domestic market, as well as improvement of operations in land registration agency and land registration by class.

9.

Protection of agricultural land, especially classes 1 to 4, against change of use and occupation for any type of construction.

10.

Undertaking of protection measures against pollution of agricultural land areas along highways, airports, major industries, urban settlements and establishment of belts where agricultural production is prohibited (in accordance with the norms) on endangered areas.

Forests and forest land:

1.

Ranking of forests and forest lands, for the purpose of optimal growing of best quality forests in certain areas, that will be most suitable for the specific areas assessed as most appropriate in terms of specific conditions in the growing area.

2.

Application of method of impregnation or gradual cut in pure high-trunk forest stands, and application of group selective cutting in forests growing on extremely sloppy terrains.

3.

Depending on the age of trunks, the following growing cuts should be applied: cuttings aimed at lighting of new growth ranging from 1 to 10 years of age; cuts for new growth clearing when aged 10-20 years; thinning in forests aged 20-40 years or cuts for areas between 40 and 60 years.

4.

Timely completion of growing and restoration activities, with pre-defined annual action plan and programme.

5.

Annual plans and mid-term programmes for afforestation should give absolute priority to areas of extensive erosion and terrains in the vicinity of watersheds of artificial accumulations .

6.

Afforestation of bare lands with indigenous tree species, especially around water springs intended for water intake.

7.

Afforestation of bare lands and agricultural areas along busy roads, metallurgical facilities, factories for non-ferrous metals and thermal power plants, for the purpose of protection against increased level of pollution.

8.

Intensification of activities and modernization of technology for nursery material production in forest nursery grounds, their regional specialization and application of the latest expert and scientific growing methods.

9.

Prior to erection of fences for game breeding for hunting purposes, elaborate should be prepared on the hunting site, subject to consent by the relevant governmental body.

Mineral resources:

1.

Identification of areas for mineral resources exploitation and impacts from the scale of the resource utilization and reclamation thereof, through spatial plans for areas with special purpose.

2.

Substitution of agricultural production and its exclusion for the period of exploitation of the mining shaft by the mineral resource user.

3.

Prohibition of permanent location of infrastructure and building structures on established mining areas for metal and non-metal ore exploitation and coal bearing basins.

4.

Prohibition of location of polluting industries within areas with identified and assumed artesian waters and compulsory implementation of sewerage systems with biological treatment of waste water in surrounding settlements.

Natural heritage protection:

1.

Determination of boundaries and marking of all items proclaimed and proposed as natural heritage.

2.

Prohibition of performance of any industrial activity based on the measures and goals of protection specified in legal act for the natural good proclamation or in the spatial plan of the area of special purpose.

3.

Within areas and zones under strict protection, only scientific and research activities will be allowed.

4.

In areas with character of natural heritage, use of flora and fauna species will be allowed only for sanitary and health purposes.

5.

In areas proposed for protection as natural heritage, development and planning by the moment of their proclamation shall be carried out in accordance of prior valorization of natural values and environmental impact assessment.

6.

National and other infrastructure (ground and underground) should be positioned outside structures with natural values, and in case of minor interventions, its aesthetic incorporation into natural landscape should be ensured.

7.

Establishment of monitoring, permanent control and supervision over structures with natural values and undertaking of professional and administrative procedures for adverse conditions remedial.

8.

Establishment of professional cooperation with the relevant institutions in the neighbourhood and protection of border areas with natural values (parks and reserves).

Process of urbanization, populated places and rural areas:

1.

Provision of decentralized and balanced spatial development through full implementation of the planning concept of the system of populated places and system of central settlements.

2.

Harmonization of the process of migration with the dynamics of economic growth, reduction of migration movements, intensification of daily migrations.

3.

Establishment of network of spatial functional units, thus rationalizing spatial functional organization and enabling efficient meeting of the needs of the population.

4.

Development of urban settlements in accordance with the concept of system of centres defined in the plan.

5.

Acceleration of the development of medium and large scale cities, through selective guidance of the development of economy, functions of social standard and infrastructure, and more efficient connection with regional centres.

6.

Limited spatial and physical demographic development of the national centre and acceleration of the development of sub-urban settlement through integrated planning approach assuming more efficient communication and direct functional connection with the city.

7.

Development of rural, hilly and mountainous and border areas under direct influence of the closest urban centres, in circumstances of more efficient communication connection and selective economic and functional development of rural settlements.

8.

Selective approach to economy in rural settlements, by relying upon natural and agricultural potentials.

9.

In the planning of development of cities and sub-urban settlements through the planning documents at lower level, application of measures by which:

- urban attributes are improved and promoted, through maintenance and improvement of existing material stock (infra and supra-structure) of urban settlements;
- more rational and efficient use of building land is ensured, through establishment of appropriate incentive financial and land use policy;
- identity and specific features of urban settlements are affirmed through application of appropriate planning

and designing methods in future development planning;

- expansion of urban building land is dissimulated, and stimulation of more rational and more efficient utilization of existing engaged area through introduction of specific measures;
- expansion of the scope of building land is allowed for exceptional purposes: transportation and power facilities and corridors, protection systems and complexes, forest and greenery protection complexes, production and other vital facilities of social importance;
- minimum extension of housing zones in populated places, especially in urban settlements, under conditions by which compactness of areas of undeveloped lands will not be disturbed;
- building within current boundaries of urban building land area and building land in surrounding settlements is stimulated, through application of economic and environmental measures and planning norms and standards;
- the status of sub-urban settlements is improved through integrated planning of the development of the city and surrounding settlements in the domains of transportation, municipal infrastructure, public functions and economy;
- the state of the environment in populated places is improved through application of appropriate planning regulations and norms;
- improvement of the state in zones of illegal building, low hygiene settlements and substandard zones in cities and surrounding settlements is encouraged;
- identity of urban settlements is improved and restored, and living and working conditions are qualitatively improved through: optimal density in housing and working zones

(application of current normatives), observation of existing urban and architectural matrix, equipment with elements of municipal infrastructure, enlargement of green areas and elimination of collision factors (e.g. transit transport).

10.

Development of rural settlements and rural areas planning through selective approach, by applying measures aimed at:

- provision of more efficient transport connection, planned development and equipment of rural settlements with elements of communal infrastructure and necessary functional content;
- provision of more rational organization of settlements through application of inductive approach in the analysis of state and definition of specific development needs;
- stimulation of the need of the population for sustainable existence in the native environment through full affirmation of the vital aspects of living and working and establishment of the necessary social and economic security;
- preservation and affirmation of cultural and natural particularities and values and preservation of the quality of environment in rural areas.

Public functions:

1.

Determination of mandatory (minimum) scope and standard of services, specifically by type of service and differentiated by: regional specificities, extent of development and goals for development fostering in individual priority areas, the financing of which involves the state.

2.

Establishment of a system of public functions financing, based on the following criteria: quality of proposed programmes, their adjustment to specific features of individual areas and quality of acquired services.

3.

Development of programmes for reducing spatial disparities in the development of public functions, with measures for enhanced availability of services to the population in rural settlements, underdeveloped and hilly and mountainous areas.

4.

Staffing and financial support to the units of the local self-government in the implementation of priority programmes in the area of public functions.

5.

Establishment of different funds for public functions organization and functioning.

6.

Introduction of mobile health care services to deliver health care in smaller scale populated places, especially in hilly and mountainous and border areas.

7.

Organization and construction of complementary institutions in the area of education.

8.

Enhanced use of prefabricated and standard buildings for the purpose of more rational utilization of capacities.

Population and economy:

1.

Municipalities with their areas being demographically depressive or stagnant should include in their spatial plans adequate measures (investments, policy, strategy), to provide conditions for proper population growth.

2.

Municipalities within which populated places have experienced notable demographic concentration in the past development should give priority to qualitative components of future development, thus reducing mechanical influx towards them.

3.

Stimulation of selective economic development of urban industrial centres of various hierarchical rank, with measures and

instruments for stimulation/ destimulation and methods of direct guidance.

4.

Differentiation of local public revenues.

5.

Encouragement of investments placement in priority areas specified in the Plan (free economic zones).

6.

Relatively more intensive investment in the infrastructure of small and medium scale cities.

7.

Encouragement of small and medium scale entrepreneurship through development of production crafts in rural areas and small scale urban settlements, establishment of small scale industrial plants, for finished products of high quality (domestic patents, models, programmes, etc.).

8.

Provision of favorable investment conditions.

9.

Development of priority infrastructure.

10.

Stimulation of engagement of higher educated professionals from urban centres in areas of priority development.

11.

In the course of initial stages of tourist areas activation, priority stimulation of communal infrastructure development and individual non-commercial contents of public standard.

12.

Stimulation of the construction and use of tourist infrastructure and equipment.

13.

Stimulation of the differentiation of tourist potentials by type, quality, quantity, position, natural and man-built values.

Water management:

1.

Establishment of protection zones around springs and ground water resources in accordance with the standards applicable for this type of resources, in order to preserve the quality of water.

2.

Establishment of protection zones around water basins of surface water bodies above the points envisaged for water extraction.

3.

Construction of waste water treatment facilities for populated places and industry within the watercourses basins.

4.

Prohibition of construction of industrial and other facilities producing waste water of high power of pollution, within surface water and accumulations basins planned for water supply and irrigation.

5.

Preservation of water quality as stipulated by the Decree on waters classification, with appropriate waste water treatment prior to discharge in the recipient.

6.

Priority in protection should be given to basins envisaged for water supply, i.e. waters from watercourses belonging to I and II categories in accordance with the Decree on waters classification.

7.

Preservation of areas intended for irrigation through prohibition of construction of infrastructure and other facilities that would prevent land utilization.

8.

Preservation of areas intended for pipelines development for irrigation and water supply, especially regional and national pipelines.

9.

Preservation of accumulation areas of any structure that would increase costs or prevent the establishment of accumulations. To this end, there is a need to mark the heights of accumulation areas within which any construction activity will be prohibited.

10.

Undertaking of ameliorative and other measures aimed at protecting basin areas of accumulations against erosion.

Energy:

1.

Extension of the legislation for the purpose of adequate harmonization of the interests of the state, consumers, producers and distributors, on one side, and new investors and private capital, on the other.

2.

Adoption of appropriate measures for consumption management (tariff policy, proper energy resources pricing, provision of demanded energy forms to the market, etc.).

3.

Prevention of unfavorable trend of decrease in the scope of research, development, investments and expert staff drain.

4.

Protection of projected corridors intended for energy infrastructure against settlements and other infrastructure erection.

5.

Improvement of the level of utilization of energy system and enhancement of its flexibility and reliability.

6.

Restructuring of economy, especially industry.

7.

Rationalization of energy consumption at all levels.

8.

Reduction of total energy consumption, especially heating energy consumption.

9.

Reduction of electricity loss through continuous modernization of transmission and distribution networks.

10.

Extension of operation life of existing facilities through their revitalization and modernization.

Transport and communications:

1.

Development of planning grounds and programmes for implementation of the main transportation routes necessary for efficient connection of the most important internal systems in the country with the appropriate systems in the direct and wider international surrounding.

2.

Reservation of the application of stricter regime of protection against any building on corridors intended for construction of international (E), national (M) and regional roads and corridors for construction of national railway lines in urban plans.

3.

Definition of protection green areas in the corridors of national and regional infrastructure and definition of conditions for safe crossing with secondary infrastructure through spatial and urban plans.

4.

Dislocation of existing and planning of construction of new road and railway routes outside building coverage of populated places, tourist, recreation and commercial complexes and protected areas.

5.

Planning of bypass road and railway sections around populated places by application of environmentally best alternative.

6.

Elaboration of expert elaborates on the application of adequate technical solutions in transport infrastructure to contribute to efficient environmental protection.

7.

Reservation of appropriate areas and protection zones for airport complexes development and definition of specific regime of modern technical solutions and principles of balanced dispersion in the development of the system of airports, in spatial plans.

Environment:

1.

Implementation of cadastre of air polluters and their categorization related to emissions quantities and effects, for each of environmental management regions and establishment of information base for comprehensive emission and imission monitoring, including additional measuring points in the framework of existing network in accordance with the developed programme.

2. Management of pollution in industry and energy: enhancement of the efficiency of systems for waste gases purification with recorded major industrial and energy generation polluters.
3. Management of traffic pollution.
4. Implementation of water polluters and their categorization related to effluents quantities and effects, for each of environmental management regions and establishment of information base for comprehensive emission and imission monitoring, including additional measuring points in the framework of existing network in accordance with the developed programme.
5. Improvement of the quality of surface waters through implementation of priority programme, through two phases - by 2010 and from 2011 to 2020. The first phase should include compulsory construction of all industrial waste water pre-treatment plants in cities with high level of connection of industrial polluters to urban sewerage network, while in other cities pre-treatment should be performed only in cases of connection to the urban sewerage network.
6. Implementation of programme for waste water management in mineral resources exploitation (monitoring of the quality of overflow waters, automatic dosage of agents during micro-flotation in Toranica, Sasa, Zletovo and Bucim, (waste water recycling).
7. Utilization of biogas for heat and electricity production from deposits of planned and existing waste water treatment plants.
8. Protection of springs, wells and ground waters as potential resources for water supply through establishment of zones for strict sanitary surveillance, wider protection zones for sanitary limitation, zones for hygiene and epidemiological limitation and zones for hygiene and epidemiological monitoring and observation.
9. Management of the quality of lakes and artificial accumulations through system of measures.
10. Establishment of measuring network and monitoring of the quality soil in characteristic areas with recorded potential pollution based on established programme.
11. Recultivation of areas degraded by open excavations, ore tailings disposal sites, smelting slag disposal sites (Jugohrom, Steel Works, Smeltery, Fenimak) and ashes from thermal power plants (REK "Bitola" and "Oslomej" Kicevo) based on established programme.
12. Recultivation of municipal solid waste landfills and illegal dumping sites, especially in areas with endangered natural resources (surface and ground waters, cultivable areas) based on established programme.
13. Recultivation of industrial landfills for hazardous and harmful waste (OHIS, "Usje", factory for artificial fertilizers in Veles, etc.) after the completion of the central landfill for such waste.
14. Protection of zones in areas close to urban zones and tourist resorts.
15. Establishment of a system of protection measures in areas with recognized biological diversity, primarily within national parks, natural reserves and areas of flora and fauna species survival outside natural reserves.
16. Adoption of national plan for waste generation minimization.
17. Identification of optimal solutions for regional waste disposal (sanitary disposal, composting, recycling, incineration) according to the type and quantity of

generated waste for each of the operational gravitation zones in accordance with established programme.

18.

Safer use of toxic chemicals.

19.

The Framework Law on Environment and specific rulebooks and secondary legal acts concerning individual segments of environment and all international laws and conventions adopted or in an adoption procedure, will create basis for implementation of measures for protection, control over law enforcement, sanctioning, provision of financing conditions in the area of environment protection and approximation of the national legislation with European development trends, adapted to local conditions.

20.

Financial management will be carried out at a level of region (region for environmental management and gravitation zone for solid waste).

21.

Policy will be established within the region through agreement between investment beneficiaries (public enterprises, production entities, service users, etc.) and competent authorities and with regard to required investments (with relatively high costs), decision will be taken by those responsible for payment.

22.

The system of financing should apply the polluter pays and consumer pays principles.

23.

Encouragement of establishment of agencies to cover specific environmental segments (solid waste, water resources, land management, forest management, etc.), as factors of organized and profitable environment improvement, within frames stipulated by law.

Cultural and historical heritage:

1.

Determination of boundaries of recognized monumental areas and entireties.

2.

Determination of values of recognized monuments of culture.

3.

Determination of protection archeological zones.

4.

Development of classification and categorization of cultural heritage.

5.

Monitoring, permanent control and supervision over objects possessing cultural and historical values.

6.

Remedial of damages caused to monuments of culture and history, especially those established in the course of the several last years.

5. GUIDELINES AND ELEMENTS FOR SPATIAL AND URBAN PLANS DEVELOPMENT

Spatial plans of regions, municipalities and areas of special interest and urban plans of settlements shall comply with the Spatial Plan of the Republic of Macedonia, especially with regard to the following elements:

- purpose and use of land areas;
- long-term policy of urbanization;
- network of major (national) infrastructure;
- network of settlements;
- protection of the environment.

The guidelines of the Spatial Plan of the Republic of Macedonia regarding land areas purpose and use are as follows:

- while elaborating urban plans, areas for all urban solutions should be identified exclusively from among existing building regions, while beyond these boundaries on areas of lower quality class (above IV category);
- guiding of weekend zones, agricultural and other facilities establishment only in areas to be specified for such purposes by spatial plans on lower level.

With regard to long-term policy of urbanization, the guidelines of the Spatial Plan refer especially to:

- common use of space and synchronized building of infrastructure systems within unique corridors;
- application of the principles of targeted urbanization in order to achieve approximately equal living and working conditions on the whole territory;
- selection and distribution of economic activities in accordance with natural conditions, available manpower and existing commercial facilities;
- establishment of possibilities for new jobs creation in settlements and areas where current population should be retained and migrations controlled;
- distribution of facilities of public functions in accordance with the needs of the population in order to reduce differences in availability of such functions;
- organization of territories of settlements exclusively on areas that have not been used for urban purposes so far, and on areas reserved by urban plans for new, mainly economic activities, that have not been transformed into new purpose;
- adjustment of densities of population, development and levels, in order to observe the principles of human living and rational exploitation of the space and urban content in accordance with all types of protection.

In the domain of major infrastructure systems, guidelines contained in the concern the main network of national importance. By spatial plans of regions, infrastructure network is designed in line with the current network, with which it will form unique system. This refers to the network of regional and local road sections, network of local gas pipelines and long distance power lines of 110 KV and less. All these networks will be developed in accordance with the requirements of the given area and ability of the basic network.

With regard to the system of settlements, lower level spatial plans should comply with the Spatial Plan, taking into account the

overall population potential of the country and the policy of targeted urbanization.

The basic network of settlements should develop in a way that each municipality, in accordance with its specific conditions, will differentiate the given network in sub-degrees in order to define precisely the functional contents. This concerns especially conurbations, double cities and settlements in areas with better infrastructure development, where it is rational to envisage certain common facilities and contents that can not be justified for individual settlements.

In the domain of environment protection, spatial and urban plans should comply with the Spatial Plan of the Republic of Macedonia, in the manner in which, based on the regime of protection specified in the Spatial Plan, distribution of activities and development of facilities will be organized in line with the requirements of sustainable economic development and modern understanding of protection.

Specific measures and activities intended to achieve sustainable use of the space, as well as specific interests of spatial development, include:

1. Enforcement of existing laws and regulations concerning protection of space, resources and national heritage and space organization and planning aimed at overall development, especially with regard to:
 - Illegal construction;
 - Management of forests, agricultural land, waters, etc.;
 - Protection of natural and man-built wealth.
2. Elaboration of expert plans and adoption of relevant regulations for areas of particular national interest.
3. Existing building areas should be used in a sustainable manner, for the purpose of which spatial reserves should be explored and amendments and supplements of existing plans for space development should be carried out. Expansion of spatial construction areas and establishment of new ones may be carried out in new urban plans, on the basis of criteria specified in regional spatial plans.

4. Guidelines and criteria for space development outside construction areas should be formulated on professional grounds and advices by the sectors of agriculture, water management, forestry and environment. Particular attention should be devoted to the planning of infrastructure corridors and facilities for priority use of existing routes and less valuable areas.

5. In the planning of settlements (especially urban) development, and adjustment of such plans to the new demands and initiatives, spatial reserves in established structures and optimal possibilities for development, should be specified through:

- Determination of limit capacity of existing infrastructure above which implementation requires huge investments, and direct the development towards areas that have or can achieve equipment with infrastructure of required capacity;

- Identification of possibilities for use of working zones through internal transformation, modernization and better use of premises and equipment, gradual dislocation of polluting activities from settlements (especially from cities with tourist and recreation values);

- Establishment of conditions for location of small scale commercial facilities in smaller settlements, especially family businesses in rarely populated areas;

- Planning of tourist contents in coordinated manner, compliant with the guidelines of the Spatial Plan, compulsory outside areas with preserved natural values and protected parts of nature;

- Restoration of historical contents through introduction of appropriate contents and values protection.

6. INSTITUTIONAL, ORGANIZATIONAL, SCIENTIFIC AND RESEARCH SUPPORT TO THE PLAN IMPLEMENTATION

The implementation of the Spatial Plan of the Republic of Macedonia will be carried out by specialized state institution through:

- development, adoption and implementation of spatial and urban plans;

- establishment of conditions for investment projects under the competence of the Republic of Macedonia and issuance of opinions under the permits issuance for investment projects implementation of special interest to the country;

- implementation (simplification) of the process and the procedure for consent and permit issuance for investment projects implementation beyond building land area scope;

- development of spatial information system (including spatial planning documentation);

- elaboration of spatial and environmental aspects in studies addressing feasibility of certain projects of interest to the country;

- coordination and development of transboundary projects in the domain of space planning and development and environment protection, when those are of special interest to the country;

- development of programmes, development policies, normative and legal regulations, normatives, standards and other instruments required for the implementation of the Spatial Plan of the Republic of Macedonia;

- development of other programmes, expert works, reports and other materials, in accordance with the requirements of state bodies and commercial organizations;

- scientific and expert research in the domain of space and settlements, as well as environment organization and development, with priority in:

- institutional and governance, economic issues and legislation in these areas;

- international experiences in spatial development regulation, development of settlements and protection of environment, with priority of management, information, institutional, economic and methodological aspects.

For the purposes of the said priorities implementation, it is necessary to establish institutional, information and organizational network enabling ongoing and systematic

transfer of information towards the surrounding in areas of importance to the country, including collection and systematization of scientific and expert research in various areas in the country and abroad.

In this context, the following priorities have been proposed by areas:

1. Spatial structures, environmental economy and economic growth;

- Research of spatial and urban planning matter on sub-national level (regional, municipal, local, etc.);

- Research of geospatial factors of the Republic of Macedonia within their surrounding;

- Critical research of the theory and the practice of space and settlements planning and development in the Republic of Macedonia;

- Development of methodology for elaboration and evaluation of spatial and structural reconstruction of industry and development of appropriate conceptions.

2. System of spatial and urban planning and methodology of planning:

- Research in the space functioning and urban planning under conditions of combined economy and development of compatible models of social, economic, environmental and other planning;

- Problems of valorization of spatial and urban plans;

- Exploration of measures for planned guidance of development in specific areas (border, hilly and mountainous regions, etc.);

- Development of methodology for monitoring and evaluation of the Spatial Plan implementation in the Republic of Macedonia.

3. Housing:

- Development of standards and normatives for public and bank incentives for subsidized housing building through their territorial differentiation.

4. Development of villages, agriculture and agricultural land development:

- Development of detailed typology of rural areas and settlements;

- Research in non-traditional forms of rural areas and settlements development: industrialization of villages through environment friendly projects and establishment of the necessary resource base;

- Investigation of potentials of rural areas on the basis of defined criteria;

- Investigation of socio-economic developments in agriculture and in villages, based on representative polls, by regions and for the whole country, in order to assess the impact of agricultural policy on the problems in economic, ownership, and production structure of individual assets, as well as more rational and more efficient utilization of agricultural land;

- Investigation of the needs for development and implementation of programmes referred to in this Plan.

5. Protection of environment:

- Development of environmental impact assessment studies within spatial and urban planning;

- Development of biological and bio-engineering methods of environment protection and endangered areas restoration;

- Procedure for hazardous matters treatment, criteria and methodology for location selection for landfills;

- Investigation of environmental and spatial capacity for development of certain areas in the country, with priority to: environmentally most valuable, best protected areas (national parks and other areas), areas with highest concentration of population and activities and areas with greatest spatial potentials for development.

7. PLAN IMPLEMENTATION MONITORING AND ACHIEVEMENTS EVALUATION

For the purpose of the Spatial Plan implementation, it is important to provide:

- intersectoral coordination and adjustment of interests in the space;

- staffing and organizational equipment of state institution responsible for the Spatial Plan implementation;

- organization of information system;

- cartographic basis for spatial plans at lower level;
- spatial data systematization by regions and spatial entreties determined by the Plan.

The monitoring of the Spatial Plan implementation will be performed by the Plan developer, on the basis of specific programme.

In parallel with the Plan adoption, information centre will be established within the state institution.

With regard to the monitoring and implementation of the Spatial Plan of the Republic of Macedonia, the competent institution will report, once in a year, to the Assembly of the Republic of Macedonia.

8. NATIONAL SPATIAL PLANNING INFORMATION SYSTEM

For the purposes of the Plan implementation, as well as for the purposes of spatial and urban planning at other governance levels, it is necessary to initiate systematic work aimed at introducing and development of harmonized spatial information system and environmental information system.

The concept of information system development should define the following elements:

1. Scope and quality of information demand for different types of spatial and urban plans and environment protection and improvement programmes, related to the type of governance.
2. Criteria for INDOK services establishment within spatial/environmental information system.
3. Methodological framework for communication among INDOK services within the system, as well as communication with other information systems and networks.
4. Project for staffing (including programme for professional staff and system users training), technical and programme equipment of spatial information system.

The above projects should specify the manner of redesigning of existing networks of data of spatial, urban and environmental relevance (different records, cadastres monitoring systems, etc.), in order to ensure their conformity with spatial, urban and environmental criteria. Modifications required in this context should be elaborated in accordance with the following criteria:

- Connection of independent and partial networks of data into one whole, assuming digital processing;
- Modification of existing resource orientation, goals, contents etc., in accordance with the requirements of related systems of data;
- Minimization to tolerable level of repetition of high number of same characteristics in several systems;
- Provision of system and manner of control and confirmation of digitalized data validity;
- Stipulation of the manner of individual data sets keeping through records keeping and specification of the manner of accessing thereto;
- Development of programme for sustainable and systematic data updating;
- Harmonization of the contents of databases and indicators systems with the new needs, depending on the needs for provision of expert information and decision making with regard to development plans, programmes and projects.

IV. EUROPEAN AND REGIONAL DOCUMENTS OF SUSTAINABLE SPATIAL DEVELOPMENT AND OTHER REGIONAL INITIATIVES, PROJECTS AND PROGRAMMES

THE MAIN EUROPEAN POLICIES

The relationship of European policy in the area of spatial development, as a partial policy, with the main European policies, is important to understand it. The main European policies, in terms of *Unity, Solidarity, Diversity for Europe, its People and its Territory in 200* include:

- Policy of competition,
- Common agricultural policy,
- Employment, human resources, development and cohesion,
- Environmental policy,
- Regional policy,
- Policy of research and development,
- Transportation policy,
- Energy policy,
- Policy of entrepreneurship for medium and small scale enterprises,
- Common fishery policy.

Among the mentioned policies, three policies have greatest influence on the spatial planning and territorial development of the European Union and the whole continent, namely environmental policy, regional policy and transportation policy.

European Spatial Development Perspective (ESDP) and European projects in the area of spatial development planning

ESDP was adopted by separate Resolution in 1999. It is the first formal document in the area of spatial

development planning in the Union since 1989, when it was decided to develop European strategic framework in the domain of spatial development planning, i.e. when the European Union and the European Commission initiated cooperation in this area. This document is a novelty by the fact that sustainability is not treated as an environmentally acceptable economic development only, but also as a balanced spatial development. Apart from this, the document introduces a new way of decisions harmonization by different sectors in accordance with common spatial matrix, known under the term "spatially effective sector planning". In Hanover, in September 2000, at the 12th Session, the **Guiding principles for Sustainable Development of the European Continent** were adopted. These principles are not binding, but they stress the meaning of territorial dimension of human rights and democracy exercising. Their goal is related to definition of measures and policies for spatial development, by means of which people in all Member States will acquire acceptable living standard, considered one of the most important preconditions towards stabilization of democratic processes and structures in Europe's structures and cities, through their active involvement in the process of European integration and democratization.

Guiding principles adopted in Hanover compose a document aimed at achieving Pan-European sustainable development.

Adoption of ESDP and related documents is, *inter alia*, manifestation of restored interest in strategic approach towards the organization of urban and

regional space in Europe (at different levels), focused, actually, on space quality and its essential and vital cultural dimension. In this way, **ESDP** is a result from changes in the territory and the practice of European planning.

However, ESDP is a kind of "roofing" document, as it intends to be, to a certain extent, unifying with regard to the policies of the European Union (policy of competition strengthening, environment protection, regional policy, transportation policy, policy in the areas of research, technology and development, etc.).

The latest version of ESDP represents a planning and development document of indicative and integrative nature, that is a general "plan/programme" at supra-national level. In this way, the Union is the first major global region that has defined common spatial vision for its territory development.

In summary, ESDP is a strategic policy framework aimed at improving the cooperation between European Commission, Member States and their regions and cities, through adjustment of different policies. This document defines a spatial vision for Union's territory development, which promotes ESDP into a framework of the policy and reference document in the domain of sustainable spatial development (thus insisting on the observation of all main principles of sustainability - environmental, economic, social and cultural). Although non-binding, it defines policy options and guidelines towards decision making at all governance levels (beginning with supra-national or European, on one side, through national and regional, to local level on the other), that would lead to sustainable and balanced development.

European Spatial Planning Observatories Network (ESPON) and other information statistical support

The implementation of ESDP is supported by a parallel statistical information and research support known under the title (ESPON European Spatial Planning Observatory Network-Study Programme on European Spatial Planning), initiated by the European Commission and EU Member States governments in 1998, and then implemented during the next two years of research. This programme will continue in the period 2002-2006 under the *INTERREG III B*.

The Programme has been initiated in order to identify possible institutional, legal, administrative and financial parameters of a network of research institutions to be united under the ESPON. Researches are based on the use of dozens of indicators, that should provide a comprehensive, detailed and reliable insight in the diversity of components of the unique European space (regions, cities, spatial axes, etc.), in the following seven groups: 1. Geographical position, 2. Economic potential, 3. Social integration, 4. Spatial integration, 5. Land burdening, 6. Natural heritage, and 7. Cultural heritage.

The whole undertaking goes on in parallel with numerous activities of various international institutions and organizations working towards development of different systems of indicators of sustainable development and the so called "greenfield" of national and supra-national accounting systems. Among basic types of indicators (presenting the status of environment and development, compared to burdens and responses), the importance of the latter is particularly emphasized, as they

represent the most reliable measure that can reflect success/failure of given policy in the domain of environment protection and sustainable development. Apart from these measures, certain countries have already introduced the so called synthesis or composite indicators, such as HDI (Human Development Index), IS (Index of Sustainability), etc.

ESDP and major regional programmes

Particular role in the accomplishment of the last of the mentioned missions of ESDP, is played by regional initiatives and schemes of spatial development involving individual Member States of the European Union and candidates for EU membership. As early as in the preparatory period of ESDP, the European Commission initiated in 1996 a regional initiative known as *INTERREG II C*, in order to support trans-national cooperation in the area of spatial planning in European countries and regions (i.e. not only in EU Member States). After several years of cooperation under different regional and similar programmes and projects, finalization of its extension known as *INTERREG III B* is underway, implemented through series of projects under five major programmes that should reflect the main geographical leitmotifs of European territory, such as:

- *CADSES/VISION PLANET* (*Strategies for an integrated spatial development of the Central European, Adriatic, Danubian and South-Eastern European Space*), covering regions of Central and Southeastern Europe, Danube belt and Adriatic basin, four EU Member States, seven EU membership candidates and seven non-EU countries;

- *NORTH-WESTERN EUROPE* covering regions of North-western Europe, including seven EU Member States plus Switzerland;
- *BALTIC SEA REGION* covering areas in four EU Member States, Norway and six other countries (four EU membership candidates and Baltic parts of Russia and Belarus);
- *ALPINE SPACE* covering regions in four EU Member States and three other countries (Liechtenstein, Slovenia and Switzerland);
- *NORTH SEA REGION* covering areas in six EU Member States and Norway.

The listed programmes define priorities expressing individual or all main goals of ESDP (spatial integration, transportation accessibility, social cohesion, natural and cultural heritage conservation, etc.), specified in accordance with long-term objectives of the given area.

Contents of the European Spatial Development Perspective (ESDP), Towards Balanced and Sustainable Development of the Territory of the EU

As stated above, ESDP is an indicative and integrative planning document, so that it includes, apart from spatial aspects of development in narrow terms, several other elements of widely understood sustainable development, (1) in terms that it is not binding for EU Member States (2). It will be implemented through a series of indirect measures and instruments, to the extent to which they are ready to accept and integrate the goals of the European policy of spatial development in their national policies.

The basic rules of ESDP are expressed in a form of general goals (1) and possible policies for their

achievement (2), by which the non-binding nature of rules is emphasized, i.e. the right to choose for Member States in terms of their acceptance/refusal. Each of the three main goals is divided into several constituent target propositions, stating the possible policies for their achievement:

- **Polycentric spatial development and new relations between urban and rural areas, as one of the three main goals, is divided into four constituent targets:** 1) Polycentric and balanced spatial development of the European Union, 2) Dynamic, attractive and competitive cities and urbanized regions, 3) Indigenous, diverse and productive rural areas, 4) Partnership between urban and rural areas. Their targets include more than 20 possible policies.
- **The second general goal, "equality in access to infrastructure and knowledge", is divided into four constituent targets:** 1) Integrated access to improved transport connections and access to knowledge, 2) Polycentric model of development, as basis for better accessibility, 3) Efficient and sustainable use of infrastructure, 4) Dissemination of innovations and knowledge. Fifteen possible policies are presented, too.
- **The third general goal, "wise natural and cultural heritage management", is divided into five constituent targets:** 1) Natural and cultural heritage as development resource, 2) Cultural heritage conservation and promotion, 3) Water resources management as specific challenge of spatial development, 4) Creative

management of natural landscapes, 5) Creative management of cultural heritage. Several possible policies have been proposed for the implementation of the mentioned targets.

Regional initiatives ESTIA and OSPE

ESTIA and OSPE are the two most important regional initiatives in the area of spatial and urban development and environmental policy on the Balkans:

- *ESTIA (European Space and Territorial Integration Alternatives, Spatial development strategies and policy integration for the South-East Europe)*, i.e., Alternatives of European spatial and territorial integration, strategy and policy for spatial development integration for Southeastern Europe. This project involved Albania, Bulgaria, Greece, Macedonia, Romania and FR Yugoslavia;
- *OSPE (Observatory of Spatial Planning and Environment in South-East Europe)* is a project complementary to the former one. It involves the same countries, but emphasizes stronger the aspects of information support of preparations, adoption and implementation of decisions in the area of sustainable development and related institutional and organizational arrangements (i.e. regional observatory and network of national focal points).

The four main goals of the above two projects are:

- Comparative description of the main characteristics of trends and policies of spatial development in participating countries;

- Investigation of requirements concerning the establishment of the network of scientific, research and information support to spatial development;
- Identification of strategic priorities in the work of national and regional agencies responsible for spatial development planning;
- Identification of the main elements for formulation of common framework aimed at coordinating and integrating the policy of spatial development.

Considering the stated goals, work on a number of complex segments has been completed under both projects, including the following key documents:

- Perspectives of spatial development and planning (main trends and administrative systems);
- Approaches and views to spatial structure (monitoring and evaluation of key issues);
- Guidelines for integration of spatial priorities and policies (policies definition and implementation);
- Structure of the network of the regional *OSPE* observatory and national observatories in the domains of space and environment;
- Directory of spatial planning agencies;
- Project and trial use of Internet server for the needs of the project;
- Overview/profile of national spatial planning systems;
- Compendium of spatial priorities;
- Frameworks for spatial policy integration;
- Closing documents of *ESTIA* and *OSPE*, containing, *inter alia*, programme for cooperation under various future projects jointly named as *ESTIA/OSPE-plus*.

The following possible areas of priority cooperation have been indicated;

- Establishment of so called *Spatial Planning Forum*, to serve as focal expert and political arena in future research and other types of cooperation, as well as in the establishment of the regional network of observatories in the area of spatial planning (*OSPE*), envisaged as first step under the continued cooperation;
- Unemployment;
- Areas and sectors for priority investment programmes and projects;
- Small and medium scale enterprises promotion;
- Development of partnerships between private, public and so called third sector;
- Geographically/transportation isolated areas;
- Areas and sectors with emphasized emigration of young, educated and vital population;
- Standard/quality of living;
- Areas or sectors with outdated production and other structure;
- Priority areas of "eco-eco" reconstruction;
- Environmentally most polluted and spatially undeveloped areas;
- Problems of so called social exclusion and deprivation;
- Problems of refugees, returnees, etc.;
- Areas of most valuable/or most sensible/or most endangered biodiversity;
- Coastal areas;
- Priority areas for joint water resources management;
- Areas under high environmental risk;
- Specific border areas.

In the framework of the proposed future cooperation, a list of possible future priority research has been established, the results of which will be used as information/knowledge support in future activities at the level of *ESTIA/OSPE* regions and included states, regions and local areas. The following areas for research have been proposed:

- Theoretical, general methodological and applied methodological aspects of the planning and the policy of sustainable development in the period of transition;
- New institutional and organizational arrangements;
- Issues of "work sharing" (demarcations, delimitations, etc.) between planning and policy, market mechanisms and instruments of overall social governance, guidance and control;
- Problems of vertical, horizontal and other coordination of planning and other governance decisions;
- Planning evaluation;
- Relationship of planning visions with plans implementation;
- New procedures in the preparation, adoption and implementation of planning decisions;
- Impacts of privatization on urban land through the selection of new planning management approaches and systems;
- General and specific issues of information and other knowledge support;
- Format, i.e. content and form of the new generation of documents in the field of sustainable development on supra-national, national and sub-national levels of planning;
- Research in the needs for development of alternative scenarios

of development of new generation of documents in the field of sustainable development;

- Research in spatial and environmental impact of policies on different supra-national, national and sub-national levels on the state of the space in the region of *ESTIA/OSPE*;
- Research in the needs for so called "general education for Europe", in order to facilitate and accelerate the achievement of *acquis communautaire* for candidate countries for membership into the European Union.

Other regional initiatives and projects

In addition to co-projects *ESTIA/OSPE*, a number of other initiatives, programmes and projects of regional integration in this part of the world, play significant roles in terms of considering and defining the future development orientations of the Republic of Macedonia. More or less, all of them represent some kind of "retorts" or "derivatives" of various attempts under the European integration tradition, but also a kind of "experiments" intended mainly for adaptation of approaches and methods towards local circumstances. Although none of these initiatives is originally space-environmental (as are *ESTIA* and *OSPE*), they have been mentioned here as most of them contain individual elements in this area (for example, in the areas of transport and telecommunications, energy, environment protection, regional cooperation and regional planning, spatial planning, social cohesion, sustainable development, foreign investments, etc.):

- *Central European Initiative (CEI)*, of 1989, involves 17 members today

- (two EU Member States, seven *CEFTA* members, four countries established from the former Yugoslavia and three countries from the European part of the former USSR);
- *Black Sea Economic Cooperation (BSEC)*, with 11 members (5 Balkan countries, 3 Black Sea coastal countries, members of former USSR and three Caucasian countries, also members of the former USSR), as of 1992;
 - *Central European Free Trade Area (CEFTA)*, founded in 1992, with seven members (as of 1999);
 - *Conference on Stability, Security and Cooperation of South Eastern Europe*, as of 1996, later renamed into *Southeast Europe Cooperation Process*, represents unique autochthonous initiative of Balkan countries, i.e., extension of the former multilateral Balkan cooperation in the period 1975-91, with seven members;
 - *1995 Process of Stability and Good Neighborliness in SEE*, founded by the European Union and involving dozens of participants from the Union, from other parts of Europe and USA, as well as the most relevant European organizations, such as EU, Council of Europe and OSCE;
 - *1996 Southeast European Cooperative Initiative (SECI)*, initiated by USA, with 12 members from the Balkans and from Central Europe, with five support providing countries and significant number of international organizations involved in the work (European Union, European Commission, World Bank, European Bank for Reconstruction and Development and European Investment Bank), as well as individual regional fora;
 - *Stability Pact for SEE* (so far, the most ambitious initiative with respect to comprehensiveness, political level of management and human, financial and other resources engagement), resulting from different attempts aimed at encouraging cooperation in the Balkans in the period longer than decade. Since 1999, it has been a formal part of OSCE and involves many beneficiary countries, as well as numerous international organizations (UN, NATO, OECD, Council of Europe, etc.), international financial organizations (WB, IMF, EIB, EBRD, etc.) and regional initiatives;
 - *2000 Adriatic-Ionian Initiative (AII)*, with four countries from former Yugoslavia, Albania and two EU Members States;
 - *Danube Commission*, the oldest regional international organization in this part of Europe (with 11 permanent member countries, as of 1998) and European Union with observer status;
 - *Working Community of Danubian Regions*, with its 24 members as state regions/areas from 11 countries;
 - *Alpe-Adria Working Community*, with 19 members and observers, states and regions (as of 1978).

Law on the Implementation of the Spatial Plan of the Republic of Macedonia

Article 1

This Law shall regulate the conditions, the manner and the dynamics of the implementation of the Spatial Plan of the Republic of Macedonia (hereinafter "Spatial Plan"), the rights and responsibilities of parties in the implementation of the Spatial Plan.

Article 2

The Spatial Plan, as highest level, long-term and integral document, shall be of lasting validity.

Article 3

The Government of the Republic of Macedonia, upon the proposal by the Ministry holding responsibility in the area of physical planning, shall adopt Programme for the Spatial Plan implementation (hereinafter: "Programme").

The Programme referred to in paragraph 1 of this Article shall specify the measures and the activities of relevance for the implementation of the Spatial Plan, the priority activities, the organizational structure and bodies holding responsibility for the Spatial Plan implementation, the contents and the level of data processing and the financial resources required for the implementation of specified activities.

The Programme shall be adopted for a period of not less than two (2) years.

Article 4

The implementation of the Spatial Plan shall be ensured by the Ministry holding responsibility in the area of physical planning.

The Spatial Plan shall be implemented through development and adoption of spatial plans for regions, spatial plans for areas of special interest and spatial plans of municipalities and the City of Skopje, as well as through urban plans and other documentation for space planning and development, in accordance with the law.

For the purpose of developing and adoption of the plans referred to in paragraph 2 of this Article, the Ministry holding responsibility in the area of physical planning shall issue conditions for space planning.

The conditions for space planning referred to in paragraph 3 of this Article shall contain general and specific provisions, guidelines and solutions based on the planning documentation of higher level and graphical proposal that shall be exempt from the Plan.

Article 5

For the purpose of continuous monitoring of the state in the space and the Spatial Plan implementation, the bodies of the public administration, the units of the local self-government, the public offices, the organizations, the enterprises, the institutions and other legal entities shall be obliged to produce annual reports on the state of and changes in the space in their respective areas and to submit them to the Ministry holding responsibility in the area of physical planning.

The Minister holding responsibility in the area of physical planning shall prescribe the procedure and the manner of development, the contents of reports referred to in paragraph 1 of this Article, as well as the terms for their submitting.

Article 6

The Ministry holding responsibility in the area of physical planning shall establish database required for the monitoring of the Spatial Plan implementation and shall organize the Spatial Information System.

The Ministry holding responsibility in the area of physical planning shall regulate the manner, the procedure and the terms for information on issues related to the Spatial Plan implementation.

Article 7

The Government of the Republic of Macedonia, upon the proposal by the Ministry holding responsibility in the area of physical planning, shall submit to the Assembly of the Republic of Macedonia, Annual Report on the Spatial Plan implementation.

Article 8

Legal entities and individuals shall have the right of direct access to and use of data in the Spatial Plan, in a manner and through procedure to be prescribed by the Minister holding responsibility in the area of physical planning.

Article 9

The Ministry holding responsibility in the area of physical planning shall encourage and lead staff training in professional organizations and institutions to which professional matters in the area of physical planning have been delegated and in the bodies of the public administration, in the units of the local self-government and in organizations holding responsibility for the Spatial Plan implementation.

Article 10

Compulsory adjustment with the Spatial Plan shall be made by: the Strategy for Economic Development of the Country, Water Management Master Plan, General Plan for Forest Management, General Hunting Management Master Plan, the Strategy for Energy Development and other plans, development programmes and plans for activities of public interest.

The adjustment with the Spatial Plan shall also be done with regard to all undertakings and interventions in the space for which no other planning documentation is available.

With regard to the conducted adjustment, the Ministry holding responsibility in the area of physical planning shall issue Spatial Consent.

The form and the contents of the Spatial Consent shall be prescribed by the Minister holding responsibility in the area of physical planning.

Article 11

In the process of continuous monitoring of the Spatial Plan implementation, the Government of the Republic of Macedonia, upon the proposal by the Ministry holding responsibility in the area of physical planning, shall propose amendments and supplements of the Spatial Plan.

Article 12

The Spatial Plan, the studies, analyses and other documentation for the Plan development shall be kept in the Ministry holding responsibility in the area of physical planning.

Article 13

Financial resources for the Spatial Plan implementation shall be provided by the Budget of the Republic of Macedonia, by the budgets of the units of the local self-government, donations and other financial sources, in accordance with the Programme for the Spatial Plan implementation.

Article 14

The Ministry holding responsibility in the area of physical planning shall carry out supervision over the enforcement of this Law and regulations adopted on the basis of this Law.

In carrying out the supervision, the Ministry holding responsibility in the area of physical planning shall coordinate in particular the development of other spatial plans, urban plans and other documentation for space planning and development and shall cooperate with other relevant entities in the area of physical planning and environment and nature protection and with entities with which contracts have been concluded for performance of certain professional works related to the Spatial Plan implementation.

Article 15

Fine in an amount between 10.000 and 50.000 denars shall be imposed for violation to the responsible individual in entities referred to in Article 6 of this Law, if she/he fails to submit the requested data, information and other documentation available which is needed to monitor the Spatial Plan implementation.

Article 16

Municipalities and the City of Skopje, which have adopted spatial plans, shall be obliged, within 2 years as of the day of entry into force of this Law, to make adjustment thereof with the Spatial Plan.

The units of the local self-government, that have not adopted spatial plans, shall be obliged, within 3 years as of the day of entry into force of this Law, to initiate the procedure for adoption of the spatial plans of the municipalities.

Article 17

This Law shall enter into force on the eighth day as of the day of its publication in the Official Gazette of the Republic of Macedonia.