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**REVIEW OF THE POST-WAR SITUATION WITH  
REGARDS TO THE LAND RESOURCES IN  
BOSNIA AND HERZEGOVINA**

**Consultant for planning and  
use of the land at a local level**

Prof. Mehmed Bublin Ph.D.  
Institute for Architecture, Town  
and Physical Planning, Sarajevo

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## I. INTRODUCTION

The Project called **“Inventory of post-war situation of land resources in Bosnia and Herzegovina”** has been launched as one of the activities of the FAO in Bosnia and Herzegovina. I was engaged as a consultant for implementation of one part of the Project called "Planning of the land use at the local level".

In cooperation with the international and local staff and under general supervision of the FAO General Technical Advisor, the consultant was obliged to undertake the following activities:

- Preparation of analyses of the planning methodologies that had been applied in Bosnia and Herzegovina for the last 10 years, which will take into account the following aspects:
  - Review of the land utilization planning methodologies used in Bosnia and Herzegovina in the last 10 years. This includes specific research of methods applied at the cantonal and municipal levels, having in mind poor coordination between the local administrations at that time.
  - Description of some specific case-studies at the local level in both entities.
  - Special attention shall be drawn to the existence of certain examples of participation in land utilization planning at the local level.
  - Activities shall be undertaken in the territory of the Federation of Bosnia and Herzegovina, with special attention to the local differences in certain parts of the country.

The opinion of the Consultant was that for this kind of research work it was necessary to analyse the legal regulations with regards to the land, than the act on physical planning as well as the current methodology for regional planning.

Also the studies considering the land utilization (such as “Land Utilization Plan”) have been analysed, as well as the study called "The Village" prepared for the needs of the first Regional Plan of Bosnia and Herzegovina.

The regional plans of some municipalities and cantons, as well as the regional plan of Bosnia and Herzegovina have been analysed. On the basis of these analyses the recommendations have been issued in which direction the laws, planning methodologies and policies should be supplemented or amended with the main objective to ensure a consistent system of land management which should be established in Bosnia and Herzegovina.

Consultant:

Prof. dr Mehmed Bublin

## **II. LEGAL REGULATIONS ON LAND TREATMENT**

### **Act on Agricultural land<sup>1</sup>**

The Act regulates: managing, protection, utilization and arrangement of Agricultural lands.

Agricultural land as a natural resource is established as an asset of general interest. Agricultural land comprises: arable land, gardens, orchards, vineyards, meadows, pastures, fish-farms, reed-patches and other land which can be, due to its characteristics, most rationally used for agricultural production.

Arable land is deemed: ploughed-land, gardens, orchards, vineyards and meadows.

Legal persons shall keep records of agricultural land. Canton issues a chart of utilization value of the land (area of agricultural land and forest land) and/or Bonity chart/map.

The purpose of the land is established by the regional plans on the basis of the chart of utilization value.

Land from the 1<sup>st</sup> to the 4<sup>th</sup> cadastre /Bonity category is established exclusively as agricultural. In certain cases there is an exception foreseen by the law.

Federal Ministry gives the approval to the Canton regional plans. Regional plans cannot be accepted unless the consent of the Cantonal administration authority competent for agriculture is furnished.

Any change of the agricultural land shall be established by the regional plan.

Compensation for changing the purpose of the agricultural land is established in minimum hundredfold amount of the cadastre revenue for this land in the current year, and for temporary changing of purpose of the agricultural land at least tenfold amount.

For changing the purpose of agricultural land possibility of development of arid land is left as compensation.

All compensations collected for permanent or temporary loss of agricultural land shall be obligatorily used for development of agricultural land (levelling, melioration, irrigation, land-consolidation).

When changing the purpose of agricultural land it is regulated that setting aside and taking care of the fertile layer of agricultural land, and when

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<sup>1</sup> Official Gazette of Federation of BiH, no. 2, Jan.20, 1998

temporarily used for other purpose (building site, ore mines etc.) it is obligatory to make a project of re-cultivation.

The project of water regime arrangement in the region concerned is also indispensable, if affected.

It is provided that there is a possibility for the Canton to perform re-cultivation at the expense of the investor if he did not do this within the given term.

When obtaining the permit, the investor shall submit the evidence on payment of the compensation for purpose changing.

A Canton is herewith obliged to establish the land contamination, to collect the indemnification fee from the party affecting the land, and to carry out rehabilitation of the Agricultural land.

The obligation of control of the land value from the 1<sup>st</sup> to 4<sup>th</sup> cadastre/Bonity class is herewith established.

The obligation of the owner and beneficiary of the land to use it in compliance with its fertile characteristics and existing agricultural and technical conditions is established by the Act.

If the Agricultural land is not used as provided by the law provisions, the Cantonal authority may give the land to another user for temporary utilization. (temporary taking away of the land from the owner).

Pastures mean naturally planted land with grown vegetation and serves for grazing of cattle, and the limits of the pasture is to be established by the Canton, where the records on these limits of pastures shall be kept. Pastures may be exceptionally given to other cultures.

This law forbids nomadic grazing of sheep, except if it is an organized form of grazing.

Land Arrangement means irrigation, hydro-melioration works, levelling, aglomelioration of arrangement and fertilizing, land consolidation, construction of transport communications, forming of lots, improvement crop rotation etc.

Utilization of land with irrigation provided is to be performed according to the annual program, and the relations shall be determined by a contract.

The law starts from the system of land management, but such system is not organized in an adequate way.

The system of management means the availability of informatics, planning, organization for preparation and implementation of plans and monitoring.

However, this law does not create a consistent land management system. The law gave some competence to the Federation, but the majority of them to Cantons. Meanwhile, there are no specific solutions for informatics system although there are certain provisions on records. For utilization planning there are no provisions how to do this and monitoring is only partially determined. Institutional form of organization is not defined either.

Change of purpose of utilization of agricultural land is not respected and implementation of this provision is questionable.

Adequate compensation is not set aside for the agricultural land used for another purpose of utilization. It is spoken of the hundred-fold cadastre revenue for the current year.

The size of the current revenues is in general small. It is not taken into account what could be obtained with adequate regulation and utilization of the given land. Fertile land that must be preserved when building, in most cases it is not preserved, so in practice this provision is rarely enforced.

Projects of re-cultivation are made only formally since according to the past practice, re-cultivation is performed to a minimum extent. The examples are the ore mines and waste dumps in the Tuzla Canton with around 5.000 ha not re-cultivated. It means that here there is a lack of monitoring of enforcement of the law provisions, and/or there is a possibility of realization of the law provisions so that such re-cultivation could have been done by the Canton at the expense of the ore mines.

The provision on paying indemnification (by those who caused contamination) of the land decontamination costs is not being implemented. It is known that in Bosnia and Herzegovina the greatest contaminators of the land are thermo power plants and motor vehicles. They do not pay any decontamination charges.

Provisions on taking away of the land from the owners and users who do not till the agricultural land and giving of the land for rentals are not being implemented, at least for the time being.

According to the statistical data of the pre-war period, more than 50% of agricultural land in Bosnia and Herzegovina is not tilled at all, and in the Federation, after the war, only 12% is being tilled.

Up to now, a large number of mountain pastures have not been used economically, so individual areas are degraded and reduced to nearly bare ground. The law did not offer a corresponding solution for restricting or forbidding of grazing.

Arrangement of agricultural land is one of the most important tasks in adequate land management. There is no provision in the law for how the enormous spaces would be arranged and prepared for irrigation. In general, there is no system here.

The legislator had obviously not had the strategic vision of development, and arrangement and management of agricultural land, or what potentials exist in the agricultural land of the Federation – the legal provisions should have been drawn in this direction.

## **Act on Forests<sup>2</sup>**

Forests in terms of this law mean the land covered by forest trees or forest bushes, the area of which exceeds 500 sq.m.

Forests also mean forests hotbeds, plantations of forest woods, clearings for long-distance lines right of way. Forest land covers also arid land and meadows inside forests.

Cantonal development plans shall be made every ten years for all forests and forest lands, regardless of ownership, with the aim to assure continuity of forest managing in every canton.

Trees in the forest can be cut only after their selection and marking in accordance with directions of forest managing base.

Pure cutting of trees and devastation of forests is forbidden

Cantonal forest managing societies prepare annual operative plans of implementation of forest cultivation measures.

A special regime of forest managing is established in protected forests.

Federal Minister passes regulations on keeping cadastre of forests both in state and private ownership. In relation to the foreseen legal provisions, there is no adequate system of forest management. This uniform system is broken down by Cantons, and within themselves, division is made on national key.

Forest cultivation function is inadequately represented, and cutting of woods (both legally and illegally) is significantly above the natural increment (in the Federation there are around 1000 saw-mills of which only one third are legal).

In the laws there is no clear division between forest and Agricultural land, since according to the law on Agricultural land, all meadows are classified as Agricultural land. According to the law on forests, the enclaves of meadows within the forests are forest land.

A very small number of forests are under strict protection in the sense of cutting. In the EU, protected areas amount up to 30% of the total area, and

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<sup>2</sup> Official Gazette of Federation of BiH, no. 20, May 29, 2002.

here only 0,55%. According to the Regional plan of Bosnia and Herzegovina from 1981 it was foreseen to be 15,6%.

In the EU, utilization of forests has focused on: ecology, health, forest fruits etc. and permanent trends of growth of other forest functions, instead of cutting (their values amount even to 1:10 ratio in favour of other functions in relation to cutting).

### **Act on Waters<sup>3</sup>**

The Act regulates the manner and conditions of water managing, water-management objects and public water resources.

Protected areas of the (water flows) river coasts range between 10-50 m. Therefore, tillage of land at a distance of less than 10 m from the coast, or from the embankment edge is forbidden.

For performance of anti-erosion works it is provided, besides others:

- forestation of bare ground
- melioration of degraded forest pastures
- creating vegetation strips for regulating surface run-off
- growing of fruit-trees, bushes (shrubberies) and grass plantations

For prevention of quality degradation of water the limit values of dangerous and harmful matters, besides other for plants protection means, emitted to farm land.

### **Act on Roads of the Federation of Bosnia and Herzegovina <sup>4</sup>**

Protection strip for public roads is established as follows:

- motor way minimum 100 m
- main roads minimum 60 m
- regional roads minimum 20 m
- local roads 10 m .

Exceptionally the following strips may be smaller:

- main roads 20 m
- regional roads 15 m
- local roads 10 m .

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<sup>3</sup> Official Gazette of the Federation of BH, no. 18, of May 11, 1998.

<sup>4</sup> Official Gazette of the Federation of BH, of February 14, 2002.

It is emphasized which objects may not be built within the protective strips. It is not emphasized that agricultural production must not be performed. Research carried out in Sarajevo during the 'Nineties' of the past century indicated that at a distance of 100 m from the axis of the main road, a concentration of lead in intolerable quantities is deposited. So the research showed that in this strip, any plants with edible outside surface parts should not be grown.

It is known that salt is used for sprinkling on roads. It is not known how far from axis of the roads, the land is being salted.

It may be stated that in the protection strips, agricultural production should not be performed or it should be reduced to a limited extent. (plants with edible underground part).

### **Act on Railways of the Federation of Bosnia and Herzegovina<sup>5</sup>**

The Act mentions protection strips, but it does not establish their value.

The following protection strip is established by the law on safety of railway traffic<sup>6</sup>:

- railway strip 8 m (6 m urban part)
- protection strip 200 m

The law does not specify what may be or what may not be built, i.e. how it can be used. Railways in general, compared with traffic roads have less negative effects since electric and diesel traction is used for railways; salt is not used either.

For railways, special mixtures are used for weed killing, and due to great speeds, trains scatter various matters that are transported. Therefore, it can be stated that the strip of 50 m from the track axis is unacceptable for farming production.

### **Act on Electric Energy<sup>7</sup>**

According to this law it is forbidden to plant vegetation on the land, on the right-of-way and in the immediate vicinity of power lines and electrical plants, which may endanger safety of these lines and plants, human life and property.

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<sup>5</sup> Official Gazette of the Federation of BH, no. 41, of October 2, 2001, Sarajevo

<sup>6</sup> Law on Safety of Railway Traffic ("Official Gazette of SRBH" No. 2/92)

<sup>7</sup> Official Gazette of the Federation of BH, no. 41, of August 23, 2002, Sarajevo



The law has also provided for obligatory access to these electrical plants, regardless of the ownership of the land.

### **Act on financial support in primary agricultural production <sup>8</sup>**

This is a new law the application effects of which are not known yet. Money support has been foreseen for primary agricultural production, refunding of interests for investments, support of expert institutions and support of introduction of new technologies in primary agricultural production. The funds are minimum 3% from the budget funds.

### **Act on Area Arrangement <sup>9</sup>**

In accordance with the bases of the federal level of competence, area arrangement assures planned management, utilization and protection of the Federation area, as a specially valuable and limited estate.

Planned management, utilization and protection of area (planned arrangement of the area) is assured by implementation documents of the area arrangement, based on a comprehensive proceeding to the area arrangement and to the principles of sustainable development.

Primarily, the public interest, general and special objectives, coordination of sector policies and harmonization of individual interests with public interest is determined by procedures of preparation, development and adoption of documents of regional regulation.

With the aim of adequate environment protection, strategic evaluation of influence on environment (SEA) is completed through the policy of development of regional arrangement documents in accordance with the environmental law.

The regional plan of the Federation contains the policy of utilization of the land and directs the development of functions in the area. The Regional plan among others determines the basic intention of the area and the measures necessary for renewal and rehabilitation of the area.

The programme of measures for the area arrangement of the Federation as a separate document establishes the obligation of arrangement of the land relevant for the Federation and the sources of financing the arrangement, as well as the terms determined for bringing the land to the planned purpose.

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<sup>8</sup> Official Gazette of the Federation of BH, no. 28, of May 26, 2004,

<sup>9</sup> Official Gazette of Federation of BH, no. 52/2002

Regional plan of the Canton and the City should contain the basic purpose of area (agricultural, forest, construction land, water and other areas). Within the Urban plan, besides other things, it is necessary to determine the manner of use and purpose of areas with the proposal of their regulation (borders of construction land, agriculture and forest land).

The Law also obligates the creators of development of planning documents to use all previously developed plans, studies, reports, etc., to ensure cooperation with owners of real estate and other users of space. It is also necessary for the carriers of the development of planning document, document of completion, in accordance with the legal regulations relevant for area arrangement.

Document of area arrangement of narrower area must be harmonized with the plan of wider area.

### **Instruction on obligatory unique methodology for preparation and development of regional and town plans and urban rows<sup>10</sup>**

Preparation and making of development plan is completed in two phases, as follows:

1. First phase includes development of analytical documentation base and adoption of concepts of development
2. Second phase includes making of development plan

Analytical documentation base consists of all significant elements for planning of area or urban development. During the development of this document, all relevant previous research work for the given area is used.

Within this document, among other things, natural conditions are determined as well as the purpose of space. In the graphical part, synthesis map of use of space is necessary.

The base for developing the concept of regional and/or urban development and possible alternative solutions for individual areas, are represented by the results of analysis and evaluations of status of the area arrangement and the defined directions of development in variants.

The basic contents of the development plan documentation for Agricultural land should contain the data about:

- cultivatable and non-cultivatable soil in accordance with purpose
- balance of farm land in accordance with use value
- area of melioration, redistribution (consolidation) of land, etc.

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<sup>10</sup> Official Gazette of SRBH, number 22, 1987

For forest land, the following indicators are necessary:

- balance of forest land
- forest and economic land areas
- protective and protected forests and forest resources
- areas intended for pastures and changing into more valuable content
- hotbeds
- use of forest and forest land

Within the measures and directions for implementation of plan, it is necessary to ensure:

- explanation of planned solutions from the aspect of protection from pollution of water, air and soil
- areas and measures for rehabilitation
- land policy
- farm and forest land with indication of utilization value in planning period, borders of forest economy areas, land planned for rehabilitation, melioration, distribution, forest planting, bringing degraded forests into more valuable contents, etc.

### **Environmental Law<sup>11</sup>**

This law is developed on the basis of directions on the protection of environment in the EU and with professional assistance of representatives of the EU. It is adopted with the same text in both the Republic of Srpska and Federation of Bosnia and Herzegovina.

The law, among other things, determines the principles of preservation and protection of soil within the development study of influence on the environment and strategic evaluation of influence on environment (SEA). During the development of plans, programmes and laws, it is necessary to complete SEA studies, and during all significant projects, it is necessary to complete a study of influence on the environment.

Accompanying regulations – directions for development of these studies are still not adopted. Experiences with development of Study of influence on environment exist in Bosnia and Herzegovina, but there is no experience in development of Strategic evaluation for environment.

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<sup>11</sup> Official Gazette of the Federation of BH, number 33 from July 19, 2003

### **III. ANALYSIS OF SEVERAL REGIONAL PLANS**

#### **Regional Plan of Bosnia and Herzegovina for the period 1981-2000<sup>12</sup>**

This plan was brought in January 1982 and according to the Act on regional planning of the Federation its validity was extended until preparation of the new Regional plan.

This plan sublimated all previous experiences in regional planning in the former Yugoslavia, and it was prepared according to the Act on regional planning from 1974 based on the Swiss and the French Laws. At that time, the latest achievements in the field of regional planning in the World and, especially, in the Western Europe, had been used.

Within this plan the following has been established:

- that agricultural land in Bosnia and Herzegovina covers an area of 2.573.000 ha or 50,3%
- that Category I-IV agricultural land covers only 31,35% of the territory
- that annual consumption of agricultural land is huge and it amounts to approx. 3000 ha/per annum.
- that the area of agricultural land intensively used by 100 inhabitants in the period of 1961-1980 was reduced from 39 ha to 20 ha.

Of the total amount of land it was found that arable land covers an area of 16.075 km<sup>2</sup> or 31,44%, agricultural land 25.730 km<sup>2</sup> or 50,32%, while the woodland covers an area of 23.420 km<sup>2</sup> or 45,8%.

Unproductive land covers an area of 1.833 km<sup>2</sup> or 3,58% (settlements, transport communications, energy facilities, etc.).

Within the planned development of agriculture, certain regionalization of production and orientation towards the food production has been made. Drainage was planned on approx. 200.000 ha and irrigation on approx. 60.000 ha.

Certain measures have been initiated with regards to expanding of the properties, land consolidation, hydraulic land reclamation and improvement, protection of land, as well as in preparation of activities for implementation of detailed development plans.

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<sup>12</sup> SR BH Executive Council and SR BH Parliament: Draft Spatial Plan of BH for the period 1981-2000. Sarajevo 1982.

With regards to the forestry, it is planned to increase the areas covered with forests from 46% to 55% of the total area of Bosnia and Herzegovina.

Emphasis is made on the forest management with the aim of water regime improvement, protection of land from erosion, game management, cultivation of forest vegetation, cultivation of forests intended for leisure activities, and similar.

Later stage proved that those measures in the field of agriculture had never been enforced; on the contrary, negative trends increased in 1961-1980 period, and especially in the period between 1991 and 2000.

The processes that developed after 1981 had been characterized both with legal and, especially, with illegal construction in the river valleys, close to the roads and transport communications and on the outskirts of the towns, namely on the best quality agricultural land.

Average of 0,35 ha per person of land used for agricultural purposes represents only 74,5 % of the necessary amount of land per person (0,47 ha).

Land distribution established on the basis of the plan was as follows:

	1980.	%	2000.	%
Agricultural land	25.730 km <sup>2</sup>	50,3	20.238	39,6
Woodland	234.20 km <sup>2</sup>	45,8	281.21	55,0
Unproductive land	583.30 km <sup>2</sup>	3,58	2.765	5,4

From the above table it is visible that the planned distribution of land is made at the expense of the agricultural land, the percentage of which was reduced from 50,3% to 39,6%, while the amount of land used for construction was significantly increased. Also the amount of land under forests increased from 45,8% to 55%.

### **Middle Bosnia Canton Regional Plan <sup>13</sup>**

This Canton possesses very unfavourable hypo metric structure (highland country) because only 4,9% of the area is situated below 500 m above the sea level. This means that almost the whole development of the Canton is oriented towards the narrow river valleys, where the best quality agricultural land is located.

In the food production development plan for this area, the focus is on utilization of modern technologies on a smaller production area and on utilization of water and energy that require new technologies (increase of production per unit of land).

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<sup>13</sup> Middle Bosnia Canton, Architecture, Town and Physical Planning Institute, Sarajevo; Regional plan of the Middle Bosnia Cantone, 2001-2020, Travnik 2002.

The second orientation is on the land development.

### **Gračanica Municipality Regional Plan 2001-2021.<sup>14</sup>**

In the area balance, agricultural land covers 61,8 % of the total area of the Municipality. Woodlands cover 30,75 % of the area and unproductive land covers 7,37% (settlements, infrastructure, water courses).

From the total agricultural land in the Municipality (12.170 ha) the good quality agricultural land (from II to IV b class) covers an area of 4.822 ha.

Distribution of land is as follows:

	2001.	%	2021.	%
Agricultural land	13.301 km <sup>2</sup>	61,8	12.884	59,9
Woodland	6.610 km <sup>2</sup>	30,7	6.610	30,7
Unproductive land	1.583 km <sup>2</sup>	7,5	2.000	9,4

From this table it is visible that the land distribution in this Municipality goes in favour of agricultural land. That is very indicative especially in a dispersed system of settlements. According to the analysis, 15,1% of the total area of the Municipality is under the influence of construction of urban areas. When the first regional plan was elaborated it was established that 12,7% of the total area of the Municipality is covered with settlements (urban areas). Also the construction is not yet completely finished in this area, it is significantly degraded from the land utilization in the agricultural purposes point of view.

In the analyses made for the Tuzla Canton it was established that urban areas cover from 8% to even 40% (Živinice) of the Canton area, which indicates extremely uneconomical construction of settlements with very low density of inhabitants. (less than 20 inhabitants/ha).

Orientation is to divide the Municipality into the agricultural zones, and in compliance with their capabilities, intensive agricultural production is proposed with application of new technologies.

Orientation is also on improvement and development of land especially through either drainage or irrigation.

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<sup>14</sup> Gračanica Municipality, Architecture, Town and Physical Planning Institute, Sarajevo; Regional plan of Gračanica Municipality, 2001-2021.

#### IV. PILOT PROJECTS FOR DEVELOPMENT OF PLAN OF LAND USE FOR MUNICIPALITIES

##### Land use plan for Ključ municipality

Recently in Bosnia and Herzegovina the Land use plans for municipalities have started to be developed. Until now, for the territory of the Federation of Bosnia and Herzegovina, these plans were developed for Ključ, Sanski Most, Konjic and Stari Grad municipalities using the same methodology.

The basic review of the land use plan for Ključ municipality is given here.<sup>15</sup>

Attempt was made to make up for the lack of long term economic and technological prognosis in Bosnia and Herzegovina by statistical data from UN publications, which usually publish world trends in use of land, water, energy and monitors growth of the food production.

Development was made easier by the fact that Bosnia and Herzegovina has a deficit in production of food and that the best quality resources like land, water, energy and labour force are underutilized.

By opening an investment cycle, without which there is no reconstruction and development of Bosnia and Herzegovina, ideas are offered in this programme, which cannot be bypassed. Furthermore, they are, as far as it is known at this moment, among the few that offer a complete solution for taking an area out of social and economic decay .

Beside production of food, the Study also registered other parties interested in the land of Ključ municipality, which belong to the food system. Such interested parties, without which the food system cannot function, are: water supply, electric energy supply as a producer of energy for development of production of food, traffic, markets, etc.

**Methods** – used in the development relate to **analysis** of available data, **prognosis** of economic, technological and social development and **synthesis** included in the selection of programme objectives and ways for their realization.

In the land use plan and selection of economic and other activities a **marketing** approach was used, which starts from the market toward production, opposite of the one used by command economy (from production toward the market).

In the selection of the two existing systems of food production – American and Chinese, advantages of both were combined. Orientation toward commercial production is characteristic for the American system, with

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<sup>15</sup> Ključ Municipality, Achitecture, Town and Physical Planning Insitute, Sarajevo. Land use plan for Ključ municipality – Program of food production – Ključ 2000.

achieving high productivity per employee, while the Chinese system is oriented towards the high income per unit area, with minimum investment of means. Now, for both systems the principles “Seeds are grown for money and not for survival” are valid.

From the Chinese system the leading rule of Chinese agriculture policy was accepted: peasant who leaves agriculture stays in the village, where other economic activities need to be developed, which will create new beneficial work positions (similar experience in Israel). By following this practice, a new rural-urban configuration is proposed in the world, on the line village-municipality-regional centre.

Method of combining complementary economic activities is applied in production of food (water supply, forestry, energy supply, tourism) with which synergy effects are achieved.

With the objective of maintaining ecologic system, recycling technologies are anticipated for recycling of organic and other leftovers for beneficial purposes, either for increase of fertility of land or for other purposes in the system of production of food. Food products are combined in the programme, which contain the necessary nutrition components in making and consuming human meals.

In the selection of technological prognosis methods, the method of “leading product” was applied. This is a biotechnology, whose era started around 1986. Part of those technologies, with creation of types and sorts of plants of genetic engineering, was predicted in this Study. “Leaofrag technologies” are taken in consideration for whose application it was attempted to ensure raw material base.

Beside “desk research” “field research” had also been used, in order to check at the spot, through interviews, the statistical data on yield per acre, cultivated land that is allowed to lie idle during the growing season and unproductive land.

In the development of the Study the **Procedures** are standard, except those used for the first time in these areas such as:

- Zoning of area, by development of agro-zone charts, zones of forests, hunting areas, protected zones and other users of land;
- Evident land areas owned by the government, which can be used as the fund for the process of land distribution, consolidation of holdings, etc., with the objective of making the land bigger and solving the legal ownership relations during the construction of hydro-melioration and other buildings.

The land is divided into small holdings (average lot is 0.25 ha), and Ključ municipality has very significant potentials of amounts of water and energy. Water and energy are now in this municipality used in minimum amounts, and land on the level of around 12%.



Deficit of agricultural products is covered by import, which, on the level of the Federation, amounts to around 90% of total needs in agricultural products.

Strategic-main objective of socio-economic development of Ključ municipality is getting out of economic delay and catching up with the groups of most developed municipalities in Bosnia and Herzegovina, in accordance with measurements of GDP and DP per person, expressed in US\$.

This objective can be achieved by use of voluminous existing natural resources on which the following agriculture areas and activities can be developed:

- Production of food intended for local market and export, so that the deficit in food balances is reduced in the Municipality and the Federation, improved foreign trade and payment balance of land, in which the current import of food represents the most important item;
- Water management, which will prevent from the water elementary powers and develop wealth in water resources and offer them for multi-purpose use: production of electric energy, irrigation of over 2700 ha of agriculture land, aquaculture, tourism, sports and water recreation;
- Electric energy management, which will use water as a renewable source of energy;
- Forestry with wood industry.

These activities are complementary and mutually dependant on each other and represent parts of a joint objective.

Deficit of arable (used) land needs to be made up for by:

- Development (regulation) of agricultural land through hydro and agro-melioration, in the valleys of Sana and Sanica Rivers
- Production of food in water (aquaculture)
- Change of grain structure in favour of grain for direct human consumption (instead of cattle)
- Production of food in protected areas (green houses, mushroom houses, etc.)

## **Study of development of food production and complementary activities in the area of Podveležje local community<sup>16</sup>**

War destructions and ethnic cleansing on the territory of Bosnia and Herzegovina (1992-1995) were especially intensive in the east part of the Town and Mostar Municipality. Group of villages beneath the mountain Velež, marked as Karst plateau Podveležje, is completely destroyed, and the population was expelled.

In that plateau of Herzegovina Karst, according to the population census from 1991, there lived 3213 people in 579 homes, organized into Podveležje local community. Cadastre municipalities that belonged to Podveležje local community, consisted of land area of 16116 ha, or 13% of Mostar Municipality.

Unreasonable system of semi-nomadic cattle breeding through centuries disturbed the ecological balance on the territory of Podveležje, mountain Velež and hill slopes towards the Mostar valley. Land is destroyed to its skeleton, plant cover reduced to a minimum and low growing plants.

In the total used land, the meadows on Karst dominate, with scattered rocks on the surface, and therefore, they cannot significantly influence the reconstruction of unfavourable balance of useable land 0.074ha per person or five times less than necessary.

On the territory of Podveležje there are no permanent springs or river waters. Because of the fact that the karst lets water go through, and due to very inclined and steep relief, precipitation waters do not stay on the surface and gradually drain away, but instead they discharge in a form of rapid mountain streams into the valleys or disappear underground into the Karst.

The biggest part of needs for drinking water for the population and cattle is covered by collecting rain water into smaller or bigger cisterns (tanks), either for individual or public usage.

By accumulating rain water on selected areas and/or construction of water pipe systems with water collection in Bijelo Polje, with the objective of enabling the irrigation of gardens, there is a possibility of expanding useable land in Podveležje. By irrigation, agro-technical and other measures and operations, part of the existing meadows and fields would be brought to cultivation in the form of gardens, vegetable and fruit growing areas and lands for medical and aromatic plants.

Project of return of refugees to Podveležje, with the possibility to catch up to the pre-war population in the near future, can achieve the given objective only if it offers realistic hopes for the future.

Return into the past (nomadic cattle breeding, insecure employment, lack of water, drought summers and rock) will not be successful. That has to be

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<sup>16</sup> Osman Pirija: Projection of development of food production and complementary activities on the territory of Podveležje area. Attachment and excerpts from Regional plan Mostar 1998

“return to the future”. Development of water supply system will attract entrepreneurs and investors. That primarily relates to:

- Construction of weekend territories, as the closest favourable mountain location, where people from Mostar can come within 15 minutes by car; such a neighbourhood will have new residents, retired persons, who will continue their life activities on hobby farms with weekend houses (during the allotment of area for construction of weekend settlements an area of approx. 0.5 ha for gardens should be added besides area intended for construction of a house)
- Picnic areas, mostly for people from Mostar, who can avoid summer heat by going on a picnic in Podveležje; on recreation, sport, entertainment areas and restaurants, camps, etc.
- Small factories of food industry (dairy plant, oil industry, meat factories, etc).
- Trade shops and handicraft shops
- Modernization of traffic and including regular bus lines with Mostar and Blagaj
- Construction of the cable car, which would use the shortest way from Mostar to connect the residential areas with the City.

Production of **electric energy** with the assistance of wind has the possibility, in the near future, by value and revenue, to become the leading activity in Podveležje. Wind becomes a natural economic resource, which man uses as a renewable source of energy on a commercial basis, with significant ecologic advantages over thermal and hydro-factories. A pilot project for development of wind electric energy factories is initiated.

There are such possibilities for significant use of solar energy, especially for home use.

In order for food production in Podveležje to ensure adequate income to entrepreneurs and employees, it must be orientated towards specific products, intended for selected categories of consumers.

Because of limited natural resources, size and structure of agricultural areas, weather conditions, as well as unfavourable factor of traditional cattle production, **organic agriculture** was selected as an advantage, as a system of production (way of raising close to natural).

Today's cattle breeding and industry, and horse-breeding (poultry –breeding covered consumption in individual homes) should be expanded by goat-breeding, which was illegal in the past system in the meadows.

Other change in the previous system of cattle breeding relates to specialization: instead of breeding sheep, cattle and horses in almost every property, one branch will be selected, depending on the size, location and quality of property, as well as the age and structure of family members.

Organic (biological) agriculture in Podveležje, which relies on constant sources of high quality stable manure from private farms, possibility of irrigation in the drought period, as well as closeness of the market, can apply flexible, numerous programmes of plant production.

Orientation is on vegetables with short vegetation period intended directly for the market, and a smaller part for personal use.

By developing a water supply system and other infrastructure object, Podveležje will have the possibility to base the production of some types of vegetables and fruit in protected areas (green houses).

There is a great variety in the possibilities of production and processing of agriculture products planned in Podveležje:

- Production of seeds, nursery gardens
- Mushroom gardens, farms
- Silk-worm breeding
- Small food industry plants (slaughter houses, places for drying food, mini oil productions, centre for production of confectionery and packaging, processing and packaging of medical plants and herbs)

Beside the activity related to agricultural production, as complementary activities the following will be developed:

- rural tourism
- sport-recreation buildings
- handicrafts

## **V. LAND MANAGEMENT**

The analyses of legal regulations treating the soil issues, also the analyses of regional plans and planning methodologies, as well as the analyses of some soil utilization studies point to some very important issues that have to be addressed in the future.

The basic issues are connected to urgent codification of legal regulations from the land protection and land utilization point of view. It is necessary to harmonize the land data between the statistics and geodetic services and to create unique land computer system (land data base).

Also it is necessary to provide monitoring of land utilization and establish an organization that will deal with the land management.

Some issues regarding the land categorization, elaboration of land utilization plans, and regional plans as well as some data connected to the land are described here in more details being the subject of this expertise.

### **Land categorization<sup>17</sup>**

Knowledge that land is a limited resource which can be used as habitat for flora and fauna, as a construction material, as a ground for construction of residential, industrial or infrastructure facilities, is one of the very important factors for each community that wants to live and to work in an organized manner.

There are several ways of land categorization, not only in the world, but in our country also. For more than twenty years FAO has been intensively engaged in this problem because every year the need for production of more food is greater and the amount of arable land is smaller.

The experts of the Agropedology Institute from Sarajevo have developed a new methodology for land categorization based on recommendations of the FAO experts and experts from Slovenia.

The decision to use the experience from Slovenia is based on compatibility of terrain conditions in Bosnia and Herzegovina and in Slovenia (mainly mountainous terrain), as well as on the need for elaboration of unified methodology in the territory of the former Yugoslavia.

The essential difference between the methodologies of Bosnia and Herzegovina and Slovenia is that the land is not divided into agricultural land and woodlands, but it is treated as a natural resource, exploitation of which, in some cases, depends on the user's will.

Categorization procedure is carried out in two stages: first of all pedological sequences are separated based on circumstances imposed by natural rock (geological substrate) i.e. series of soil that appear in the same or similar substrate which determine the essential geomorphologic characteristics, as well as, the manner of utilization, broadly observed, and then these pedological sequences are divided into eight categories that are adopted from the most frequently used American classification - "Land capability classification".

When the land capability charts are produced the categories of the land capability are marked no matter whether the land is covered by pastures, meadows, arable land or forests.

Selected categories represent an indicator of the best possible form of economic management of land utilization. So for instance the land from I to III category can be used as arable soil without any danger or restriction.

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<sup>17</sup> Symposium with the topic: The Land in the Regional plans of BH, Reports, Sarajevo 1983

Whether this soil will really be used as arable land or not, depends on the regional plan, as well as on the interests or the needs of the society.

The land category IV, which has got very serious restrictions for exploitation, in the conditions in Bosnia and Herzegovina, should also be protected and brought to intensive cultivation.

Land categories V to VII depending on the needs and interest can be used for different purposes, but here dangers and restrictions are higher, which make utilization of such land more expensive. Therefore, the more inferior the category, the more difficult and less economic becomes use of the land for agricultural and forestry purposes, although the forest on such soils gives the best possible protection from erosion and landslides, and at the same time the forest gradually contributes to improvement of soil properties and consequently to the usability value of the land.

### **Land utilization plan**

The bonity map and generally the bonity expertise are not sufficient as a basis for regional planning, because they do not indicate the effects that could be achieved by utilization of land resources. In that sense an obligation for elaboration of a land utilization plan should be incorporated in the methodology and into the Act on Regional Planning.

Land utilization plans as a basis for elaboration of regional plans have never been made in our country in the past. The land as an essential, non recoverable resource has never been evaluated according to the standards applicable in the market economy system. Due to degradation of the value of this resource a great portion of the most fertile land in Bosnia and Herzegovina has been handed over to various users, without adequate compensation or replacement that could either economically or spatially compensate the permanent loss of the same.

Attempts to stop devastation of natural resources and endangering of the ecological balance on the whole territory of Bosnia and Herzegovina only by instruments of regional planning did not give expected results for two simple reasons: firstly, because neither the market economy standards nor the environmental improvement measures had been applied and secondly, because in the long term strategy for development of Bosnia and Herzegovina advantage was given to urbanization (development of the towns) while development of the village was completely neglected.

We are now faced with continuation of these trends in the post-war reconstruction of the country, because instruments for the land management and for development of agriculture have not been developed, and it is obvious that devastated villages can not be reconstructed without the assistance of the state and without adequate rural policy.

As agriculture is the biggest user of the land, it is the duty of agriculture to define and to prove its priority in relation to the current and future potential users of the land resources.

Production of food in Bosnia and Herzegovina should be classified among the priority tasks in development of the country.

### **Treatment of agricultural land in regional plans**

Today we are aware of the fact that the space represents a limited resource of the first-class interest for the society which suggests that there is an emphasized need for all the activities undertaken with regards to the space to be thoroughly investigated, planned, monitored and guided.

Therefore, one of the highest priority tasks of the regional planning is to provide criteria for rational utilization of space.

The settlements cover 1,83% of the total area of Bosnia and Herzegovina, of which about 1,3% belongs to the rural settlements (i.e. around 70%).

Transport infrastructure covers about 0,8% and together with protection strips around 2%. The same is covered with energy infrastructure which includes hydro accumulations and ore mines.

Therefore, the total area of unproductive land (settlements, infrastructure and other structures) amounts to about 5,8% of the territory of Bosnia and Herzegovina.

Topographic characteristics of Bosnia and Herzegovina are such that only 41% of the territory is situated at the altitude below 500 m, and 15,8% of the territory has a gradient of less than 13% (appropriate for use of tractors). As most of the inhabitants and the activities are concentrated in the valleys alongside several rivers and in the areas with altitudes of up to 500 m, where the best quality agricultural land is located, then the idea of the consumption of the good quality agricultural land is significantly changed.

Previous practice, in some areas of Bosnia and Herzegovina, for the residential and other buildings to be built on the worst quality land is abandoned, and the residential and other buildings are started to be built on the best quality land with emphasized dispersion, which prevents such settlements from being economically equipped both with infra and supra structure.

Very often the best quality agricultural land is located in those areas. The construction of settlements is being carried out without any social or planning guidance with significant consequences on rational utilization of the land, with reduction of the road network capacities (increased number of traffic accidents) and with creation of several kilometres long settlements.

The basic causes for uneconomical utilization of the land can be found in inadequate price for the land, lack of planning solutions (regional plans) referring to the land use and adequate evidences connected to cadastre and taxation policy, as well as the land management.

In other words, the value of land is not expressed as an economical factor – criterion for allocation of living and working activities in compliance with the public interests.

As the principles of the use of land (similar to other natural resources) are not operatively developed in plans and the practice of regular economical evaluation of the land does not exist at all, there is a wrong belief that the land is an inexhaustible and cheap asset. The consequences of such wrong belief are in distortion of prices and expenditures, deformation in functioning of the towns, due to uncontrolled concentration of inhabitants and development of towns on completely new locations (neglecting the possibility of reconstruction), expensive equipping of the towns and bad environmental conditions.

According to its character, regional planning is supposed to cover the whole area. However, the emphasis is on planning of the systems, network of the centres and area organization. The network of centres (polycentric development) mainly covers the settlements of an urban character. In that way planning of rural areas remains on the margin, especially planning of villages, because in the new Act on regional planning there is no obligation for developing of urban rows (planning documents for smaller settlements).

Therefore the biggest part of the activities in planning of the settlements refers to the urban planning, i.e. planning of the towns. Therefore, an obligation of elaboration of urban rows for the secondary centres and the centres of village communities should be introduced in the Act on regional planning, and for the villages a plan for distribution of the land into the lots with all planning and technical conditions.

If we start from the saying that "people run away from the land that cannot feed them" then special attention has to be paid to development of rural areas in all the segments of human activities. In that sense it is necessary to provide transport communications (not only roads but also buses) for the rural areas, equipping those areas with technical and social infrastructure and developing suitable production activities as complementary activities to the agricultural production.

It is necessary to free ourselves from the previous heritage of the communist system about the "idiotic way of living in the country" and glorification of the urban way of living.

Although the tendency both in the world and in our country is such that the majority of the population is going to live in the cities (more than 90%), the importance of the rural areas is going to be very high also in the future, which is evident from the examples of the European Union countries and from very active policies related to these areas.



Development of rural areas is very important, not only from the agricultural production point of view, but also from the point of view of the ecological balance and overall sustainable development.

### **Improvement of land protection, development and utilization policies**

Development policy – should be subjected to the requirements of market economy, where the process of globalisation eliminates everybody who cannot endure imposed competition. Various risks in agricultural production, low productivity and high expenditures can be concurred only by construction of irrigation systems, improvement of the land, land consolidation, application of modern technologies, training of farmers and better quality management.

Protection policy – which practically did not exist at all should now be included in the development policy. As a permanent and irreplaceable natural resource, agricultural land should be protected by a regional plan and other legal acts and regulations from those users who, in comparison with modern agriculture, can not satisfy established economical and environmental criteria. A special institution (agency) should take over the trade of real assets in the agricultural zones. That agency will be responsible for consolidation of holdings, land consolidation and preparation of land intended for food production on behalf of and for the account of the investors and for the general interest of the country.

Water-management policy – should be oriented towards more economical usage of water resources, including distribution of water obtained after treatment of sewage and industrial waste waters. By construction of an irrigation system, agriculture becomes the greatest water consumer and in that way reduces the need for arable land from 0,40 ha to only 0,15-0,20 ha per person. Water-management, in its development policy, must not be directed towards satisfaction of partial interests of certain branches of the economy or public utility services. In control of the water regime, the water management should represent general interests of the society.

Foreign trade regime – import of agricultural products and agricultural raw materials should be burdened with regular customs duties and taxes. Exemptions from customs duties should be reserved as stimulation for those importers of agricultural raw materials that will process those materials for the needs of the domestic market and for export.

Taxation system - Value added tax (VAT) should be introduced in the shortest possible period on all products, by application of different tax rates. Cessation of agricultural land to other users should be taxed fully in compliance with the value of the land, estimated after hydro- or agglomeration.

Legal regulations - It is essential to carry out harmonization of legal regulations treating the land issues, to solve the system of land management, to provide instruments that will prevent division of agricultural land and its fragmentation. It is necessary to provide constant land usage monitoring and engagement of the same for other users (outside agriculture).

Cultural aspect and its development policy must not be neglected. It should be worked on development of the work ethic, feeling for and comprehension of the value of the land, the flora and the water; development of cooperative behaviour and solidarity in usage of natural and man-made resources; prevention of wastefulness and trendiness and harmonization of the needs with the possibilities of self-production. It should also be worked on changing of the nutrition habits and tastes with the objective of more economical utilization of the food and energy as well as on change of our behaviour towards permanent assets.

Educational aspect – Adequate scientific disciplines dealing with the issues such as the village sociology, spatial development, economy of rural areas, agricultural production in rural areas, tourism and similar are not developed in Bosnia and Herzegovina.

Therefore, it would be necessary to launch suitable specialist courses of post-graduate studies at the universities as multidisciplinary studies where the problems of the villages and rural areas could be studied, because these areas make the majority of the territory of Bosnia and Herzegovina.

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