European Spatial Planning

Conditions for Development of Agriculture in the Municipality of Kline, Republic of Kosovo

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Introduction

In the thesis I decided to write about the *Condition for Development of Agriculture in the Municipality of Klina, Republic of Kosovo.*

The reason is that the municipality of Klina in Republic of Kosovo has possibility to develop the agriculture sector however it has not been developed as it could be due to the lack of financial support from the Municipality level up to the Government level.

Agriculture is one of the most important branches of economical development in the Municipality of Klina. The Municipality’s geographical position, climate and earth conditions, as well as the manpower in the territory of enables cultivation of much agricultural cultivation and the growth of high efficiency in the area.

Considering all the existing factors and the new factors (to be initiated) of the development which will be based on long term socio-economic development of the municipality of Klina, most important is the agriculture.

Making use of and harmonizing the available natural factors, agriculture will secure to the municipality of Klina sufficient food, produce an important overflow of market, and a general growth of the overall income and employment of the inhabitants.

Convenient fertile lands, the change of planting structure, adequate appliance of agro technique and watering will create propitious possibilities for increasing agriculture production, notably the development of farming.

Agriculture will for a long time be bearer of general socio-economic development in the Municipality of Klina, all it is needed is to set and realize basic purpose, role and direction of agriculture development.

This make possible orientation in development and creation of conditions for the alteration of the structure of the fabrication, utilization of the existing possibilities, and finding new ways of development, recommendation of the existing systems and building new watering systems, arranging terrene, increasing land fertility, reorganization of the manufacture and reinforcement of the private sector and execution of the more dynamic increase of trade products, intense urbanization of rural places, fair governing, equipping lands with more qualitative roads for agrarian needs.

All this will contribute to more quality and quantity innovation of the existing state. In a direct connection with this is the increase of plan efficiency and the increase of productivity, the plant fabrication with organizing conditions for using more water for watering, larger mechanisms for
productivity, the expansion of guanos and fertilizers and the application of contemporary agro technical measures.

Except the efficiency increase and the assortment of agricultural production, it must be reckoned that the farming should rapidly be developed through the specialization of private sector-farms, individual mini farms for cultivation of cattle and poultry, milk and dairy products and egg production. Buying stations and depot are necessary as well as the stations that sell cattle food, guanos, agriculture tools and mechanisms, the service for mending these tools, agrarian stations, farming pharmacy, and veterinary stations.

As my Master's thesis is an international work, I see it as a reasonable way to have given some notes about the Republic of Kosovo which are introduced in the beginning of the thesis, and in the end attached are some maps of the Republic of Kosovo where readers can be informed about the country.
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1. The Geographical Position of Republic of Kosovo

Republic of Kosovo is situated in the Southeast of the Europe. In the North, it is bordered by Serbia, in the East and Southeast by Macedonia, in the Southwest by Albania and in the West by Montenegro.

Republic of Kosovo covers a surface area of approx. 10,900 km² and is characterized by an average altitude of 800 m above sea level, but showing vertical changes of relief and morphology. These morphological changes are a consequence of the geological setting. The lowest point of Republic of Kosovo is located at an elevation of 297 m (Drini i Bardhe, at the border to Albania). The country rises up to the highest point in the South of Republic of Kosovo – Djeravice at 2,565 m.

From the geographical point of view, Republic of Kosovo can be subdivided into two large regional flat units, after Çavolli: The north-eastern part is referred to as "Kosovo Plain ", the south-western part as "Dukagjini Plain". They are characterized by special climatic-geographical conditions. For instance, several subunits like Drenica, Novoberdes and Gollakut, Fusha e Kosoves, Fusha e Morave, Podujeve et al. are distinguished.

The border between Dukagjini Plain and Kosovo Plain forms the surface water divide between the Adriatic Sea on the one side and the Black Sea and Aegean Sea on the other side.

Republic of Kosovo is surrounded by several high mountain ranges. The northern part is occupied by the Kopaonik mountains (above 2,000 m), which are characterized by
abrasive activity, both fluvial and glacial. In the southern and south-western part of Republic of Kosovo, at the border to Macedonia, the Mali i Sharrit mountains are located (above 2,500 m). The western part of Republic of Kosovo (border to Albania) includes parts of the Albanian Alps mountains and the Mali i Moknes mountains (border to Montenegro). These areas are characterized by rocky material, high mountains and deep gorges.

In the central part of Republic of Kosovo, western and north-western of Pristina, the mountain ranges Bjeshket e Çičavice and Golesh, Carraleve and Milanovc are located, which are characterized by karstic forms, both fluvial and abrasive, rising to elevations of about 1,000 m.

The part of Republic of Kosovo, which is characterized by far flat areas, covers a surface of approx. 36 % of the country territory. These basins are characterized by elevations between 400 and 700 m above sea level.
1.1 Climatic Conditions

The climate of Republic of Kosovo is predominantly continental, resulting in warm summers and cold winters with Mediterranean and Alpine influences (average temperature within the country range from +30 °C (summer) to –10 °C (winter)). However, due to unequal elevations in certain parts of the country, there are differences in temperature and rainfall distribution. December and January are regarded as the coldest months, July and August as the warmest months of the year. The maximum rainfall rate is reached between October and December. Between November and March, snowfall can be expected in Republic of Kosovo, even in the flat parts of the country. The highest snowfall rates can be expected in the mountain regions of Republic of Kosovo.

The valley between Mitrovice and Kaçanik belongs to the dryer areas of the country. In contrast, the plain of Dukagjini between Peje and Prizren is described as a very fertile area with more precipitation between November and March.

Based on the climate conditions, Republic of Kosovo can be separated into three climatic areas:

- Climatic Area of Republic of Kosovo (Kosovo Plain),
- Climatic Area of Dukagjini (Dukagjini Plain) and
- Climatic Area of mountains and forest parts.

The climatic area of Republic of Kosovo (Kosovo Plain), this includes the Ibar-Valley, is influenced by continental air masses. For this reason, in this part of the country, the winters are colder with medium temperatures above –10 °C, but sometimes down to –26 °C. The summers are very hot with average temperatures of 20 °C, sometimes up to 37 °C. This area is characterized by a dry climate and a total annual precipitation of 600 mm per year, approximately.

The climatic area of Dukagjini (Dukagjini Plain), which includes the watershed of the Drini i Bardh river, is influenced very much by the hot air masses, which cross the Adriatic Sea. Medium temperatures during winter range from 0.5 °C to sometimes –22.8 °C. The average annual precipitation of this climatic area is about 700 mm per year. The winter is characterized by heavy snowfalls.
The climatic area of the mountains and forest parts is characterized by a typical forest clime, that is associated with heavy rainfalls (900 to 1,300 mm per year), and summers that are very short and cold, and winters that are cold and with a lot of snow. Finally, it can be stated that the Republic of Kosovo territory is characterized by a sunny climate with variable temperature and humidity conditions.
1.2 Hydrology

There are many rivers in Republic of Kosovo, which flow toward the Adriatic Sea, the Black Sea and the Aegean Sea. The main rivers in Republic of Kosovo are: Drini i Bardhe (in the southern part of Republic of Kosovo – flows into the Adriatic Sea), Ibari river (in the north-western part, flows into the Morava and Danube and further into the Black Sea) and Lepence (in the south-eastern part, flows into the Vardar-River toward the Aegean Sea). More interesting, the Black Sea is drained by water from a surface water catchments area of 5,500 km², or 51 % of the Republic of Kosovo territory, the Adriatic Sea is drained by an area of 4,500 km², or 43 %, and the Aegean Sea is drained by an area of only 900 km², or 6 %.

The watersheds of the three main drainages (River Drini i Bardhe, Ibarit river and Lepenc are touching each other approximately 16.5 km west of Ferizaj, in the cadastral zone of Budakove (Municipality Suhareke). At this contact point of the three watersheds, the mountain Drmanska is located, reaching an elevation of 1,359 m above sea level. From here, the surface water flows towards the Adriatic Sea, the Black Sea or the Aegean Sea. Other important rivers in Republic of Kosovo are: Sitnica, Morava e Bisneces, Bistrica e Pejes and Bistrica e Deçanit. Republic of Kosovo also does have a large number of karst springs, thermal and mineral water springs, glacial valleys and lakes and artificially made lakes.
3-Map Hydrology in Republic of Kosovo

Legend
- Geographical basin
- Mountain margin
- Main surface water divide
- River

by Ferim Gashi
1.3 People

About 1.9 million people are living in Republic of Kosovo (Statistical Office of Republic of Kosovo). The predominant part of the population mainly lives in the areas of the fertile lowlands. However, there are numerous settlements up in the difficult accessible parts of the country, in the mountain ranges. Approximately 65% of the population lives in rural areas. Over 56% of the population in the 27 Member States of the European Union (EU) lives in rural areas.

More than 50% of the people are less than 30 years old. Ethnic Albanians in Kosovo have the largest population growth in Europe. The people’s growth rate in Kosovo is 1.3%. Over an 82-year period (1921-2003) the population grew 4.6 times. If growth continues at such a pace, based on some estimation, the population will be 4.5 million by 2050.

The majority of the populations are Albanians (approx. 92%). Beside them, there are several minorities like the Serbs, Turks, Montenegrins, Bosnians and Ashkali people. The beneficial geographical position of Republic of Kosovo is reflected in its multicultural function.
4-Map Ethnic composition of Kosovo in 2005 according to the OSCE:

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Chart 1. Population data

<table>
<thead>
<tr>
<th>Years</th>
<th>Total population in millions</th>
<th>Density (inhabitants in km²)</th>
</tr>
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<tbody>
<tr>
<td>1961</td>
<td>1.0</td>
<td>88.4</td>
</tr>
<tr>
<td>1971</td>
<td>1.2</td>
<td>114</td>
</tr>
<tr>
<td>1981</td>
<td>1.6</td>
<td>145.3</td>
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<tr>
<td>1991</td>
<td>1.9</td>
<td>179.3</td>
</tr>
<tr>
<td>2001</td>
<td>1.8</td>
<td>169</td>
</tr>
<tr>
<td>2003</td>
<td>1.9</td>
<td>175</td>
</tr>
<tr>
<td>2004</td>
<td>1.9</td>
<td>175</td>
</tr>
<tr>
<td>2005</td>
<td>2.0</td>
<td>183</td>
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</tbody>
</table>


Chart 2: Population age during the years, percentage in total population Year 2000 2001 2002 2004

<table>
<thead>
<tr>
<th>Year</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
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<tbody>
<tr>
<td>0-14</td>
<td>31.5</td>
<td>32.3</td>
<td>32.8</td>
<td>33</td>
</tr>
<tr>
<td>15-64</td>
<td>63</td>
<td>61.2</td>
<td>61</td>
<td>61</td>
</tr>
<tr>
<td>Over 64</td>
<td>5.5</td>
<td>6.5</td>
<td>6.2</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
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Source: Various researches of ménage (HFS, HBS)
On the chart we can clearly see that The Republic of Kosovo has a younger population structure than 27 states of the EU.
1.4 Infrastructure

The country’s infrastructure is well developed. A fully developed road network does exist and, in general, the roads are in good conditions. There are several main roads connecting the large towns of Republic of Kosovo and its territory with the neighboring countries. There are railway tracks to Macedonia and Serbia, but the railway system does not operate regularly at the moment. Regular international air links are provided from across Europe to Pristina, the capital of Republic of Kosovo.

5-Map Infrastructure of Republic of Kosovo
1.5 Agriculture sector

Regarding administrative aspect, the policy for rural and agriculture development and is set in national level. The policy implementation applies to national and municipal level.

Kosovo has the total of 1.1 million hectares of surface/area, which of 53% are agricultural surface, 41% forest surface and 6% other. In Denmark total land area is 43 094 km², of which 66% is under cultivation and 12% under forestry. In Sweden More than half of the territory is covered with forest (53%), 17% is mountainous and 9% is marshland and lakes. Arable land represents 7.5% and pasturage areas 1.5%. Until now from the overall surface of arable land 88.6 % is private property while the other part is owned by former national enterprises. Although now after the process of privatization that is still continuing, this percentage has changed.

Around 51 % of the farmland is used for grains (corn, wheat, and barley), 45 % for pastures and meadows, 3 % for vineyard and groves and the rest 1 %.

Source: MAFRD, 2008
The arable land is considered of good quality and the temperate climate make agriculture a possibly strong economically sector that should at some point be able to assure adequate food supply for the population and even enable the export of some food stuff.

Agriculture contributes to 30% of the GDP of Kosovo while its supports 60% of the population. Along with the forestry sector it contributes 35% of GDP. Four major challenges are currently being faced by the agricultural sector in Kosovo:

· Loss of farm land: each year some 1000 ha are being de facto transformed into built area (some estimation, puts this number much higher).
· Parcel fragmentation: the amount of land available by farming Household is low (0.5–2 ha on average). *Source: Statistics of Agriculture in Kosovo 2007*
· Industrial pollution; agricultural land are under a constant threat from polluters large and small -mainly through soil and water pollution.
· Landfills: a number of controlled and uncontrolled land fills in Kosovo are situated in around near farming areas.

Republic of Kosovo can be divided in three agricultural regions regarding relief characteristics, climates, hydrological, pedological and economics: agricultural region of Kosovo, agricultural region of Dukagjini, and hilly-mountainous regions.

Agricultural region of Kosovo- includes Kosovo Plain, Drenica (Gllogoc), Llap (Podujeva), and Anamorava (Gjilan). This agricultural region is disposable with plane area and low shores, fertile lands, low watering possibilities, continental climate suitable for corn, sunflowers, tobacco, vegetables near the rivers, and growing of some continental fruit like pears, cherries, apricots etc. Main culture of this region is wheat; however there are other white grains and corn. From the industrial cultures, sunflower is one of them that is planted most in the plains of Ferizaj, Lipjan, Prishtina and Gllogoc, while tobacco is planted most in the suburb of Gjilani, Vitia, Kamenica. When we talk about the vegetables, they are mostly planted in the valley of Llapi and Sitnica (suburb of Podujeva and Vushtrri) where cabbage, potatoes are grown. Orchard is less developed in this region. Fruit take small areas in the yards and plantations in Ferizaj area. Pears are mostly grown, and then we have cherries, quinces, and apricots. Grape is only cultivated in the private yards.
Farming is not developed very much in this region due to the lacking areas of meadow and paddocks. Individual economies keep a certain number of cows that pasture in the meadows. In the public sector exists cow farms for milk in Miradi e eperme, for fattening up in Fushe Kosovo, while poultry farm is not far from Glogoc (for eggs and meat) which has been devastated during the war in Kosovo in 1998/99.

Agricultural region of Dukagjini- introduces a morphological integral consisting of some valleys: Barani valley, Leshani valley, Drini valley, Ereniku valley, Kline valley, Mirusha valley, Prizreni river etc. and plains between the valleys of the rivers. The soil is better in the valleys and poorer in the plains and hills. The region of Dukagjini is watered in many areas while the areas that remain unwatered are planted with autumn crops, fruit, grape-vine and other plants. For a long time corn was the main agriculture, but now corn and wheat is planted together in the areas with vegetables, fruit, vineyards and meads.

The watering possibility as well as the warm climate have influenced that Dukagjini Plain is various in many developed agriculture and farming more than Kosovo Plain.

The corn area lessens while going from west towards north in these sides also we have rainfalls that lessen up while areas with white grain grow. From the industrial plants sugar-beet is cultivated in the north however sunflowers grow in the both sides of Dukagjini while tobacco is grown in the central part (Gjakova plain and Rahovec). Vegetable areas are to be found beside urban centres, near rivers where water is reachable. The most growing vegetables are peppers, tomatoes, cabbage, potatoes, onions, water melon and melon.

In Dukagjini region there are vast areas filled with fruit and vineyard. Fruit is grown in the garden near the houses and in plantations (Gjakova suburb). Apples, cherries, apricots, plums, walnuts are mostly grown maybe more than any other. The vast fruit area covers west side and the valleys where there is rainfall (near Gremniku - Kline and Bubaveci - Malisheve) and cherry plantations are cultivated and now unfortunately they have been abandoned. Dukagjini region has good natural conditions for fruit cultivation in much bigger areas.

In the south-east part of this region vineyards are expanded in two sectors. There have been built wine-cellars in Krusha e Vogel, Rahovec, and Suhareka for grape refinement. The north part of the region has meadows as well, that can be mowed 2-3 times per year depending on watering possibilities.
In the farming development has influenced the presence of the meadows in the plains and the agriculture in the mountain side. In Dukagjini there is occurrence of cattle climbing in the forest from May until October and their down movement into the plains to spend the winter time in animal dwellings.

The region of hilly-mountainous land includes peripheral territories that are above 700m elevation. This region has weaker soil, in which are forests bushes, crops 1000-1100m, potatoes and barren land.

This small part of the area about 48% is less dwelled. This region offers many possibilities for fruit cultivation, forests, and cattle keeping where there are pastures (in Sharri Mountains, Bjeshket e Nemuna), beekeeping, development of forestry and tourism.

1.6 Economical Summary

The traditional economic driver of Republic of Kosovo has been primary industry (agriculture and forestry, mining and energy generation), with manufacturing providing a minor contribution to the generation of wealth. Some 30% of GDP is provided by remittances from the Diaspora (mainly in Germany and Switzerland) who account for 20% of Republic of Kosovo’s pre-1999 war population.

Over 65% of the working population resident within Republic of Kosovo is employed within the agricultural sector. Formerly a net exporter of foodstuffs, Republic of Kosovo now has a large negative trade balance in this sector, with food products being the largest single import segment, accounting for 30% of imports by value.

The Kosovo economy’s growth (at 3.8 % in 2006 after an increase by 0.6 % in 2005) is almost exclusively driven by the private sector and by private consumption. Public consumption showed e differentioned picture, as government wages grew in linne with private household consumption, whereas growth in public consumption of goods and services was flat.

Inflation is low (0.6% in 2006, partly as consequence of the Kosovo’s use of the Euro.

The improved performance of the private sector in 2006 was refelcted on the trad balance: imports grew only modestly (5%) while exports marked a notable growth (54%),
albeit from a very low base.

In 2006, € 67.6 million in goods and services, were impoted and only € 10.4 million exported, resulting in a deficit of the balance of goods and services that was close to 60% GDP. Republic of Kosovo continues to suffer high external deficits and has one the lowest export/import coverage in the world. The imbalance is largely financed by foreign assistance (around 34 percent of GDP) and Diasporas remittances (around 30 percent of GDP), leaving Kosovo highly dependent on foreign inflows.

Notwithstanding a significant growth in 2006 in the exports of mining and processed metal products, the export structure continues to be dominated by scrap metals. Exports are almost to the EU and the South East Europe region. In 2006, UNMIK signed its accession to the enlarged Central Europe Free Trade Area, which should serve as a catalyst for continued expansion of exports to the region. As the destination to 56% of its Kosovo’s exports and the origin of 48% of its imports, CEFTA members as a group are clearly the dominant trade partner.

A key instrument in the transition to a market economy is privatization. The KTA (was under UNMIK until 15th June 2008, now is Privatization Kosovo Agency under the Kosovo’s Government), is responsible for the management SOEs and publicly owned enterprises (energy, waste, water, the airport, railways and the post and telecommunication systems) and for privatizing formerly SOEs. By mind 2007, the privatization process had yielded € 315 million (which is held in trust pending the adjudication of claims).

Continued problems of the energy sector impede private sector development. Kosovo’s power system is technically limited as a consequence of decades of under – investment, and consequently has trouble providing stable and reliable power supply which meets Kosovo’s demand. The electricity utility is reliant a government subsidies. This is only partly a consequence of widespread non-payment of bills and non-technical losses. Kosovo’s private sector is mainly small scale, often micro-enterprises.

Agriculture productivity is extremely low as a result of small farm sizes, limited capital stock and lack of technical expertise. Almost half (47.8%) of all businesses were in retail and wholesale, followed by food processing (9.3%), construction and other social personal services (both 5.3%). The informal economy remains sizeable, affecting the
competitiveness of the economy.

The 2006 budget outcome recored a surplus of 3.6% GDP, instead of a budget deficit of 2.0%. This surplus was due; on the one hand, to revenue growth being higher than planned, mainly as a result of more efficient tax collection, and on the other, to a capital expenditure execution rate of only 70%, reflecting limited administrative, public procurement and project management capacity (European Commission, 2008; Directorate-General (DG) for Enlargement at: http://ec.europa.eu/enlargement/potential-candidate-countries/kosovo/index_en.htm).
2. Geographic position of the municipality of Kline

The municipality of Kline is situated in the west side of Kosovo. In west it is bordered with the municipality of Istogu, in north-east with the municipality of Skenderaj, in east with the municipality of Drenas, in south-east with the municipality of Malisheva, and in south-west with the municipality of Rahovec and Gjakova.

This municipality was found after the World War II in 1954 as people’s council. With the later reorganizations this has continuously altered. Thus, with the reorganization of the year 1961 a 404km² territory was included (with 64 villages and according to the notes of the 1961 it has had 33,946 inhabitants, with density of 84 inhabitants in km²), although with the last reorganization in 1986 the territory has been decreased by 94.4 km² in 308.0 km² (with 54 villages and according to the notes of year 1981, it has had 42,813 inhabitants without the villages of municipality of Malisheva, thus 54,539 inhabitants with the villages of the municipality of Malisheva. Remaining an Administrative-territorial center for Kline, it has without doubt influenced its geographical position. This is due to its village gravitation, in

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1 This territory decrease of the Municipality of Klina has been done due to the establishment of the Municipality of Malisheva in 1986, where 10 villages joined the Municipality of Malisheva.
Kline’s territory there is the crossroad of the motorways and railways in many directions through Dukagjini Plain.

Natural predispositions- configurative make the territory of Kline in having exceptional infrastructure connection with the neighbor municipalities and other bigger administrative centers in Kosovo. For instance through the river Kline runs the railway Peje-Kline -Fushe Kosovo, which was circulation was released in 1936. Later was built up the part that was not finished Kline -Prizren. In the rapid development of Kline contributed the building of the highways Peje-Kline -Prishtine; Kline -Gjakove; Kline -Burim; Kline -Skenderaj-Mitrovice and many other regional roads, which we can say we noticed they are in bad condition, because of the movement of Serbian army vehicles, and we can mention the bridges that are entirely destructed, mentioning the bridge in Rakovine, Llazice, and the bridge of Kline which is rebuilt.

The municipality of Kline consists of 43 villages which contain 14 local communities Budisale, Jagode, Drenoc, Zllakuqan, Grabanice, Shtupel, Sferke, Dolle, Kline, Jashanice, Ujmire, Gllareve, Cerovik, and Zajm.
The increase and dynamism of the population of the inhabitants according to the registration of the inhabitants is given in the chart number 1.
Chart 3: The population of the Municipality of Kline according to the registration years

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>402</td>
<td>26.100</td>
<td>28.300</td>
<td>33.900</td>
<td>42.400</td>
<td>54.500</td>
<td>58.600</td>
<td>109</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td>65</td>
<td>84</td>
<td>105</td>
<td>135</td>
<td>190</td>
<td>107</td>
<td>32.500</td>
<td>125</td>
</tr>
</tbody>
</table>

Source: The Data for the number of population according to the registration years 1948; 1953; 1961; 1971; 1981; taken from Dr. Riza Cavalli, Geografia regionale e Kosoves, Prishtine, 1997 p. 338. In the meantime the estimation for the year 2008 was taken from the Municipal assembly of Kline.

According to the 1981 population registration, the national population structure has been 83.6% Albanian; 12.5% Serbs and 3.9% other (Cavalli, R. 1997). Now the national structure is 97% Albanian; while others can be estimated at 3%. According to the Humanitarian Charity Association’s Mother Teresa”, in 2000 the Municipality of Kline lived 54,709 inhabitants, while according to the OSCE for population registration the gender structure includes 60% females, 40% males, whilst structure of the ages as in whole Kosovo territory in the Municipality of Kline dominates a part of a young population. The Municipality of Kline is dominated mostly by age-group of 0-18 years old 18-25 years old which is 51-53% of the population. The estimated unemployment is approximately 32,135 or 55-57% (18-65 years old, Men: 14,150 or 44%, Women: 17,985 or 56%) of the population who are capable to work and the percentage of unemployment is 5-7% higher comparing to national unemployment average (Source: Department of Agriculture, Business Registration Office Municipal Assembly of Kline. 2008). Employed people make up 43% of the population capable of working, counting of course the employed people abroad and their agricultural economies. The unemployment is more emphasized at youth and females.

2 In 2008 the area of Municipality of Klina is 308 km².
Due to the war of 1998-99 the Municipality of Kline has inherited a low economic development as well as it has lacked investments and it has been neglected for many years. The vast capacities inherited from the 1980-ties do not function, though with the beginning of privatization (after the war of 1998/99) of state enterprises of the Municipality of Kline it is expected appeasement of high percentage of unemployment. The forceful administration of Serbs in all the enterprises and the municipality’s factories in the 1990-ties, influenced on sacking Albanian workers from their places of work, misuse of work tools like, money, technology etc, as in annexation of funds for Serbian nationalist purposes, as well as the actions and settlement of different army and police forces in the buildings of the enterprises. Thus, by Serbian retreat in 1999 they have plundered, they have stolen and devastated the outmost inventory, technological equipment, construction objects. With this heavy economical state even then face all the economy enterprises, especially public sector which before was main element of the economy of Kline Municipality and which also had a number of considerable workers. The most vital and profitable sector in economy of Kline is the business sector which until the end of 2006 the number of workers has reached 1.310. In these businesses 4,1000 workers have been employed (Source: Municipal Assembly of Klina, www.ks.gov.net/Kline/). The majority of businesses is micro businesses and is addressed as trade activities, construction, transport, hotel services, craftsmanship and repairing, as well as health and social services, more or less in the fields of production, while public services are offered by public companies.

2.1. Education,

The population has the following educational characteristics:

- 7,979 (39%) are currently attending elementary education in 14 elementary schools,
- 1,697 (21%) are attending high school in 2 secondary schools
- 3% are attending University (Source: Directorate for Education; Municipal Assembly of Klina).
2.2. Economic Development,

The municipality is characterized by a low level of economic development. Most of the existing industrial capacities SOEs function with a very low performance or do not function at all. It is expected that the start of the privatization process will release the assets that are currently under SOE management. Before the 1999 conflict, the economic activity in Klina town was centered on the following SOEs that employed approximately 1,500 people.

- Malishgani agricultural-industrial complex
- The bauxite mine in Volljak
- Mirusha Construction Company

At present, the seed factory from the Malishgani agricultural-industrial complex is operating at a low capacity (less than 10 percent of full capacity), while the Volljak bauxite mine is currently working at 5 percent of its capacity, respectively Mirusha Company at 10 percent of its capacity.

2.3 Natural Resource Exploitation,

On the mineral industry side, the bauxite mine in Volljak, the stone quarry, and the construction materials factory, when fully operational, will cover the needs of the construction industry of the municipality.

Municipality of Klina is rich with mineral and non-mineral resources that could potentially attract foreign investment:

- Reserves of lignite: 2 billion tons
- Mineral of bauxite: 2 million tons
- Clay: 6.5 million tons
- Sand and gravel: 3.5 million tons (Source: Strategy for Economic Development 2003-2006; Municipal Assembly of Klina)
3. Non-agricultural rural development options - Tourism and recreational sites, in the Municipality of Klina

3.1  *Mirusha Gorge*

Along the flow of river Mirusha, on the south and southwest side are waterfalls, which are sites of rare natural beauty supporting rich flora and fauna. This complex, covering 200 hectares, is a protected nature reserve, with good potential for tourism development. Currently there are discussions to declare the Mirusha waterfall as a national park. Once this decision is taken the central budget will allocate more funds for the necessary investments and adjustments.
This will boost the domestic and possibly international tourism in the Mirusha falls and this is expected to provide excellent opportunities for SMEs involved in tourist-related activities, as well as a potential income for the municipal budget (through a fee charged to the visitors/tourists).

Mirisha Gorge, which is currently (Dec 2007) under consideration for registered legal status as a national park, is the only significant environmental asset capable of generating any revenue as a tourist site.

It is sure that the tourist potential of Mirusha only exists in the attraction of local tourists to the Drini Bardhe end of the gorge (near the main Gjakova- Kline road) where two large waterfalls exist. Although the tourist potential of Kline is limited, Mirusha has its symbolic importance as the emblem of the municipality, and its careful management is therefore important.

*Photo 4: Mirusha canyon*

### 3.2 River Peja and Drini Bardhe

The Kline, River Peja and Drini Bardhe Rivers all form central elements of Kline’s rural landscape beauty, as well as functioning as recreational sites for fishing. Measures proposed to limit the discharge of raw sewage directly into the river systems will also greatly improve the recreational value by improving the quality of the water for fish.

Planting of trees at selected points will both improve the visual attraction of the river corridor and stabilize the River Peja and Drini Bardhe banks to prevent erosion. Trees are of course important along the river and streams due to the fact that their root system help the river bank to resist erosion, the leaves from the trees provide organic matter for the system of the river as well as providing food and cover for the area wildlife, the shades of the trees
would control temperature for the fish and they would have as well a great impact for many other species that have been on pressure due to the utilization of arable land.

### 3.3 Mining

There are 199 hectares of both the Volljak Bauxite mine and the stone quarry on the Prishtina – Peja road which fall within the boundaries of KFA land. However this shows a problem for KFA boundaries that should therefore either be changed (ie excising land) or the land use should revert to forestry by enrichment planting.

The development of lignite extraction in Kline is excluded from the list of planned development options, for operational reasons.

Other mining activities that are in less conflict with the environment remain more successful options for sustainable development, including bauxite mining at Sferke, and building stone extraction at the quarry on the main Kline – Prishtina road.

### 3.4 Lignite mining

The development of lignite mining and power generation in Kosovo is focused more on the Obiliq region which is in northwest of Prishtina. The new lignite mine and power plant there is scheduled to become operational between 2013 and 2015. Together with the modernized existing power plants, this will be sufficient to supply the energy demand of all Kosovo in addition for allowing the optional export of energy to neighboring states.

In the long term there are small reserves of lignite mining in Kline. If we compare lignite reserves in Kline 5 square kilometers to that of Kosovo Plain around Prishtina which is 20 square kilometers. Klina has a hilly terrain which is difficult to operate for lignite mining, thus there is insuitable infrastructure neither staff that have necessary skills for mining.

MEM does not have any plans to have a lignite mining in the region of Kline for the next decades, while the Kosovo Bauxite Company whose exploration licence issued by ICMM has been withdrawn by request of MEM does not share the same idea with MEM.
3.5  Bauxite Mining

Kline municipality is considered to contain medium to large bauxite reserves in a North – South strip of land approximately ten kilometres long (north - south) and two to three kilometers wide (west – east) in between Dolc (Kline) in the north and Llapceve / Rudne (Malisheve) in the south. It also refers to the villages Gremnik, Cypeve, Voljake and Dush. An exploration license for the bauxite resources was issued to the company “Compania Boksitet e Kosoves” on 30 January 2006. The license has the registration number 269 and the license number 517. It is registered under the name of two of the villages in the area, “Gremnik Llapqev”.

The Volljak Bauxite mine has had a serious environmental impact on the local landscape in terms of the indiscriminate disposal of mining spoil and crushed stone. Since this and the open cast extraction site have a major visual impact on the landscape, in addition to the noise and dust which are generated, there is a direct conflict with the proposal to further develop the quality of the neighboring landscape and local facilities to encourage and attract tourists to Mirusha gorge.

However, assuming that the environmental impact can be limited, and there are adequate efforts to rehabilitate land that has been used through reforestation, bauxite mining at the Sferke / Volljak site remains a feasible future activity, especially in a zone of high rural population where the economic alternatives and quality of agricultural land are low.

If the Kosovo Bauxite Company is privatized successfully by Kosovo Privatisation Agency bauxite mining in the southern central part of Kline will continues and may even be extended. However if the privatization fails, the mine could be closed down completely.
3.6  Sands and Gravel extraction

Extraction of sand, aggregates and building materials from alluvial deposits is a widespread activity in which occurs in small local quarries, sand pits and gravel pits. Thus sands and gravels are extracted directly from river beds, river banks or nearby floodplains. However the environmental effects are highly damaging to the protective vegetation cover, increasing soil loss and increasing vulnerability to the effects of future flooding events.

All such activity is prohibited by law and should be actively prevented except in permitted locations. When it comes to places there is a large sands and gravel grading site near the turn off from the main Kline road to Volljak, though it is unclear whether extraction is from near or within the nearby Drini Bardhe, or from alluvial deposits that are a safe distance away.
4. Natural elements for agricultural development in the municipality of Kline

Farming is one of the most important branches of economic development in the Municipality of Kline, considering its geographical position, climate and soil conditions which enable the growing of many agricultural cultivation as well as growth of high efficiency.

The geographic position of Klina and its climate, especially in the region of the Dukagjin valley, make it ideal for the development of agricultural activities. Particularly promising activities include the cultivation of plants, vegetables, farming, and poultry. Klina has a sufficient supply of water from its rivers to build an adequate irrigation system. The construction of irrigation reservoirs with the water supplied by the four rivers that run through the fields will enable the irrigation of up to 2,000 hectares of agricultural soil. Klina’s agricultural sector includes the following firms:

- 5 agricultural cooperatives
- 1 seed factory
- 1 animal food factory
- 1 mushroom factory
- 1 cherry and hazel farm

Kline belongs to the intense area regarding its agricultural development possibilities due to the 87.7% of the area that is 600 meters above the sea. 95% of overall area of the Municipality of Kline is agricultural land, and 4.9% are barren land. In the agriculture lands structure fields dominate with 12,734 hectares, forests with 12,735 hectares, meadows with 2,184 hectares and grass with 2,043 hectares etc (Source: Kosovo Cadastral Agency, 2008).
**Chart 4: Agricultural land use statistics**

<table>
<thead>
<tr>
<th></th>
<th>Kline 1</th>
<th>Kline 2</th>
<th>Kosove/Kosovo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>54,900</td>
<td></td>
<td>2.0 Mio</td>
</tr>
<tr>
<td>Population/km²</td>
<td>178</td>
<td></td>
<td>183</td>
</tr>
<tr>
<td>Extension, total</td>
<td>30,849 ha</td>
<td>31,807 ha</td>
<td>1,089,500 ha</td>
</tr>
<tr>
<td>Arable Land</td>
<td>12,782 ha</td>
<td>17,923 ha</td>
<td>311,538 ha</td>
</tr>
<tr>
<td>Meadows</td>
<td>2,230 ha</td>
<td></td>
<td>87,470 ha</td>
</tr>
<tr>
<td>Pastures</td>
<td>2,096 ha</td>
<td>474</td>
<td>178,309 ha</td>
</tr>
<tr>
<td>Forest and Scrub</td>
<td>11,566 ha</td>
<td>11,716 ha</td>
<td>466,000 ha</td>
</tr>
<tr>
<td>Other</td>
<td>2,175 ha</td>
<td>1,692</td>
<td>46,183 ha</td>
</tr>
</tbody>
</table>

Sources: ¹ ASPAUK, Land Use Summary Report, 2004; Agricultural land utilization projekte of European Agency for Reconstruction ² interpretation of Satellite imagery 2001; ³ OSCE Municipal Profile, May 2006; ⁴ KFA

From the table above, it can be seen that land cover information as given by the ASPAUK Land Use Summary Report gives a similar area estimate to that from the satellite image interpretation, the only difference being that the satellite image interpretation does not differentiate between arable land, pastures and meadows. The similarity of land use information implies long-term land use stability. Taking into account that the ASPAUK statistics are based on old data from the 1960’s from the KCA, this implies that land use in the Municipality of Kline has been quite stable over the last 40 to 50 years.
4.1. Relief as a condition for agriculture development

The relief together with its forms influences in a right and wrong way in expanding agriculture and its efficiency, in man’s work, in tools, in movement while it lessens the hill-mountainous effect. The pedological substratum becomes shallower with the height increase thus the agriculture can not develop normally.

The territory of the Municipality of Kline has its many geomorphologic characteristics. The Eastern part is characterized with its height while Western part is plain. The Northern part and north-east of the Municipality consists of the part of Drenica Mountains and the east and south-east part consists of hilly-mountainous region called Lapusha. West side and central side supplement the flat of the Plain of Dukagjini.

The parts that belong to Dukagjini Plain are in the area of 500m above the sea level, whereas hilly parts are mainly between 500m – 700m. In the south-east has a small part of this territory has the height bigger than 700m.

The territory height is convenient enough for plant production, because 87.7% of the area or 35.343 hectares is up to 600m of the sea level, hereupon whole the territory of the municipality of Kline belongs to the intense area practical for agriculture and orchard in.

Chart 5: The expansion of the area according to the elevation in the Municipality of Kline

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Area Hectare</th>
<th>%</th>
<th>Cumulative Hectare</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Until 400</td>
<td>5.477</td>
<td>13.59</td>
<td>5.477</td>
<td>13.59</td>
</tr>
<tr>
<td>400 - 450</td>
<td>5.130</td>
<td>12.73</td>
<td>10.607</td>
<td>26.92</td>
</tr>
<tr>
<td>450 - 500</td>
<td>8.260</td>
<td>20.50</td>
<td>18.867</td>
<td>46.82</td>
</tr>
<tr>
<td>500 - 550</td>
<td>7.651</td>
<td>18.98</td>
<td>26.518</td>
<td>65.80</td>
</tr>
<tr>
<td>550 - 600</td>
<td>8.825</td>
<td>21.90</td>
<td>35.343</td>
<td>87.70</td>
</tr>
<tr>
<td>600 - 700</td>
<td>4.282</td>
<td>10.62</td>
<td>39.625</td>
<td>98.32</td>
</tr>
<tr>
<td>700 - 800</td>
<td>675</td>
<td>1.67</td>
<td>40.300</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The major characteristics are the following and there are three different agro-ecological zones:

1. Mountains: low agricultural potential, extensive grazing agriculture, forest with low productivity, but high potential.
2. Hilly zone: heterogeneous partly good soils, medium potential mainly used for livestock production and rainfed crops.
3. Valleys: deep fertile soils, some irrigation, high potential for intensive high value crops.

During 1948-1981 have occurred vertical movements of the population, however they were not intense. The expansion of the areas and population in the Municipality of Kline in 1948-1981 can be better seen in the chart below.

**Chart 6: The expansion of the area and the population in the Municipality of Kline in 1948-1981 according to the elevation.**

<table>
<thead>
<tr>
<th>Elevation</th>
<th>The area in frequencies</th>
<th>The number of population in 1981</th>
<th>The population number in frequencies</th>
<th>The number of population in 1948</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fr Frc</td>
<td>Fr Frc</td>
<td>Fr Frc</td>
<td>Fr Frc</td>
</tr>
<tr>
<td>300-400m</td>
<td>13.0 13.0</td>
<td>12.207</td>
<td>22.4 22.4</td>
<td>17.3</td>
</tr>
<tr>
<td>400-500m</td>
<td>36.4 49.4</td>
<td>17.721</td>
<td>32.5 54.9</td>
<td>55.4</td>
</tr>
<tr>
<td>500-600m</td>
<td>43.5 92.9</td>
<td>20.511</td>
<td>37.7 92.6</td>
<td>93.1</td>
</tr>
<tr>
<td>600-700m</td>
<td>7.1 100.0</td>
<td>40.100</td>
<td>7.4 100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Dr. Asllan Pushka, Aspektet Gjepopullative ne Kosove dhe rrerh saj. Prishtine 2000, p. 52 (Fr: Relative Frequency, Fc: Cumulative Frequency)

We can clearly see on the chart that there is an uptrend of the population in the lowest part of the Municipality of Kline (300-400m) even though this area takes place of just 13% of the Municipality area. To better resist this population movement, areas with major heights should have a better connection with roads, economy and infrastructure buildings should be constructed as well.

In 1948 in this part of the municipal area used to live 17.3% of the population meanwhile in 1981, 22.4% of the population. In the other vertical areas the participation of
the areas is a little bit higher than the population, it is important to point out that the vertical movements were not as intense due to the lack of the mountainous relief (Pushka. A. 2000).

Population movement towards low areas is tied up with the centre of Kline and across the highways that cross in this zone as well as having a better connection with the other centers of Kosovo and due to the vast fertility of the lands and water.

9-Map Municipality of Kline Elevations
4.2 Climate and its role in agricultural development

The climate in this territory is characterized with average climate with Mediterranean influence. Rainfall dispersion is inconvenient for agriculture due to the low rainfalls and non equal dispersion in the vegetation period. The dryness is frequently present in spring, during the months of April and May and this gives us to understand that the soil needs to be watered, which means that it is a possibility that until now has been taken advantage by classical means form the inhabitants while forming classic dams for watering agricultural land. According to the studies that have been done in this territory, it is obvious that the average air temperature is 11.3°C.

The coldest month is January with an average temperature of -0.3°C, meanwhile the hottest is the month of August with an average temperature of +22°C. The average winter temperature is 1.1°C while the average spring temperature is 10.9°C and the average autumn temperature is 12.3°C and the average temperature in summer is 20.9°C.

The average day temperature is from -10°C until -5°C which is present 8.5 times or 2.3% during the year. The average day temperature form -5°C until 0.0°C includes 30.3 days or 8.3% of the year. The first interval with average day temperature positive form +0.1°C until +5°C includes approximately 57.8 days or 15.9% of the year. This period includes the time from October to May.

With a positive day temperature of 05°C until +10°C there are 61.2 days a year, respectively 16.8%. These average temperatures are concentrated mainly in the months of spring and autumn.

The temperature of +15°C until +25°C covers most of the time period that is 56 days or 15.5% and is present in April-October interval. The average temperature from +25°C until +30°C is present during the months of May-September and it lasts 11.2 days or 3.1%.

The period of the temperatures without freeze holds out 209 days or 57% of the year -while the other part is frosty. The average first day of freeze is 30th November (-1°C), whilst the earliest happenig freeze can be on 21st October, nevertheless the last day in subzero temperatures is 9th March and the latest 1st April.
The above mentioned average day and season temperatures show that the amplitude is evident. This is more clearly shown in the chart where monthly and yearly average temperatures are apparent:

**Chart 7: The average month and year temperature 2004**

<table>
<thead>
<tr>
<th>Months</th>
<th>Average Month Temperature</th>
<th>Max</th>
<th>Min</th>
<th>Amplitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>0.2</td>
<td>11.0</td>
<td>-11.0</td>
<td>22.0</td>
</tr>
<tr>
<td>February</td>
<td>1.7</td>
<td>14.5</td>
<td>-12.7</td>
<td>27.9</td>
</tr>
<tr>
<td>March</td>
<td>5.9</td>
<td>21.2</td>
<td>-6.7</td>
<td>27.9</td>
</tr>
<tr>
<td>April</td>
<td>12.4</td>
<td>25.5</td>
<td>-0.4</td>
<td>25.9</td>
</tr>
<tr>
<td>May</td>
<td>15.8</td>
<td>28.7</td>
<td>-4.4</td>
<td>24.3</td>
</tr>
<tr>
<td>June</td>
<td>19.4</td>
<td>21.7</td>
<td>8.4</td>
<td>23.4</td>
</tr>
<tr>
<td>July</td>
<td>21.0</td>
<td>33.9</td>
<td>10.6</td>
<td>23.3</td>
</tr>
<tr>
<td>August</td>
<td>21.0</td>
<td>34.0</td>
<td>8.5</td>
<td>25.5</td>
</tr>
<tr>
<td>September</td>
<td>18.0</td>
<td>30.0</td>
<td>5.0</td>
<td>25.5</td>
</tr>
<tr>
<td>October</td>
<td>12.3</td>
<td>25.2</td>
<td>1.0</td>
<td>24.2</td>
</tr>
<tr>
<td>November</td>
<td>6.9</td>
<td>18.6</td>
<td>-4.7</td>
<td>23.2</td>
</tr>
<tr>
<td>December</td>
<td>2.4</td>
<td>12.6</td>
<td>-10.6</td>
<td>2.0</td>
</tr>
<tr>
<td>Average Year Temperature</td>
<td>11.6</td>
<td>24.0</td>
<td>0.8</td>
<td>23.2</td>
</tr>
</tbody>
</table>

**Figure 4: The temperature movement during the months of the year in Kline, 2004**

According to these data of the climatic conditions, agriculturists confirm that these temperatures make possible the cultivation of many plants in this territory. Through the Valley of Drini Bardhe influence to some extent extend the Mediterranean climate.
4.2.1 Relative air humidity

Relative air humidity- in lack of data for the Municipality of Kline, I have taken for analyses the Municipality of Peja due to the nearness between these two municipalities, therefore the differences are no big and therefore the data can be taken into consideration for the Municipality of Kline. The relative air humidity is 70.2% in the Municipality of Peja while the average air humidity is 59.7% that characterizes this territory as averagely humid. This can be seen clearly in the graphic way.

Chart 8: Yearly relative humidity in the Municipality of Peja 2007

<table>
<thead>
<tr>
<th>Months</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>IX</th>
<th>X</th>
<th>XI</th>
<th>XII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humidity</td>
<td>72</td>
<td>73</td>
<td>64</td>
<td>58</td>
<td>62</td>
<td>61</td>
<td>55</td>
<td>56</td>
<td>31</td>
<td>63</td>
<td>71</td>
<td></td>
</tr>
</tbody>
</table>

Source: Hidro Meteorological Institute of Kosovo 2008-06-17, the chart was done by the author.

We can see from the chart that the relative humidity during the winter time is high when the temperatures are low, while during the summer time the temperatures are high and the humidity is lower.

4.2.2 Cloudiness

Clouds are an important meteorological element. Regarding to the data, we can see that the number of clouds is much smaller than those clear days. The number of sunny days (103) and those of cloudy (82) days, are of a great importance for agriculture.
The smallest average cloud for the Municipality of Kline is in the month of September (2.9). The average annual cloud is 5.5 in ten parts of the sky in the Municipality of Kline.

4.2.3 Rainfalls

Rainfalls are an important climate element. Rainfalls are of a vast importance in extension and development of flora and fauna. According to the data for the rainfalls, there is a difference in the monthly and yearly expansion. Due to the lack of the latest data for the Municipality of Kline, I have taken for analyses the Municipality of Peja due to the closeness between these two municipalities and the latest data 2002-2007, therefore there are no big differences and can be taken into consideration for the Municipality of Kline.

The average annual rainfall is 68.4mm. Autumn has more rainfalls with 280mm, and winter 271mm, that make these two seasons among the seasons with more rainfalls. On the
other hand spring has 193.9mm and summer at least 153.7mm of the rainfalls. The difference between the most humid and the driest season is 126.9mm. Dispersion of the rainfalls is inconvenient for agriculture, due to their appearance during the winter (October-December) period. Despite this, during the vegetation period there is much less rainfall with unequal dispersion.

If we consider the low air humidity and high temperatures during the summer season, then this amount of rainfalls has less effect. Drought frequently is noticeable in spring, notably during the months of April and May. This gives us to understand that this territory is dry and must be watered. During the year averagely there are 85 snowy days or 23% yearly. The snow can be earliest seen on the 5th November and the latest snow can be seen on 20th April.

*Chart 10: Average monthly rainfall view of for 2002-2007 in mm.*

<table>
<thead>
<tr>
<th>Months</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>IX</th>
<th>X</th>
<th>XI</th>
<th>XII</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>16.5</td>
<td>62.4</td>
<td>26</td>
<td>93.6</td>
<td>81.3</td>
<td>8.6</td>
<td>39.6</td>
<td>139.3</td>
<td>11.8</td>
<td>20.1</td>
<td>14.1</td>
<td>111</td>
<td>52</td>
</tr>
<tr>
<td>2003</td>
<td>220</td>
<td>48.4</td>
<td>2.5</td>
<td>34.6</td>
<td>66.4</td>
<td>45.3</td>
<td>9.5</td>
<td>31.2</td>
<td>80.3</td>
<td>4</td>
<td>99.3</td>
<td>47.5</td>
<td>70.4</td>
</tr>
<tr>
<td>2004</td>
<td>77.8</td>
<td>117.8</td>
<td>101.2</td>
<td>86.7</td>
<td>140.4</td>
<td>92.3</td>
<td>61.1</td>
<td>24.9</td>
<td>110</td>
<td>61.5</td>
<td>112.4</td>
<td>95.8</td>
<td>90.9</td>
</tr>
<tr>
<td>2005</td>
<td>37.3</td>
<td>114.5</td>
<td>66.2</td>
<td>57.9</td>
<td>63.6</td>
<td>38.2</td>
<td>23.8</td>
<td>53.2</td>
<td>45.7</td>
<td>47.2</td>
<td>96.5</td>
<td>212.2</td>
<td>71.4</td>
</tr>
<tr>
<td>2006</td>
<td>96.8</td>
<td>93.6</td>
<td>97.8</td>
<td>37.1</td>
<td>43.9</td>
<td>106.1</td>
<td>91.5</td>
<td>63.6</td>
<td>44.1</td>
<td>39.1</td>
<td>54.2</td>
<td>21.5</td>
<td>65.8</td>
</tr>
<tr>
<td>2007</td>
<td>70.1</td>
<td>37.6</td>
<td>103</td>
<td>18.6</td>
<td>51.8</td>
<td>49.8</td>
<td>1.0</td>
<td>18.5</td>
<td>71.1</td>
<td>131</td>
<td>159</td>
<td>12.9</td>
<td>60.4</td>
</tr>
</tbody>
</table>

*Figure 5: Average month expansion of rainfalls in mm during 2002-2007.*

Source: Hydro Meteorology Institute of Kosovo 2008-06-17, Charts were done by the author.
These notes show that drought of this territory has a great influence on agriculture, if we consider high evaporation during the period of vegetation from the high temperatures in summer.

### 4.2.4. Hoarfrost

Hoarfrost is important for the agriculture in this territory which on average lasts 24.7 days or 7% of the year. Hoarfrost is visible from September until May and mostly in the month of December. Hoarfrost is a negative climate occurrence that evidently decreases agricultural efficiencies.

**Chart 11: The appearance of hoarfrost in the first and last days during the period 1956 – 1970**

<table>
<thead>
<tr>
<th>Years</th>
<th>First day</th>
<th>Last day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1956/57</td>
<td>21.X.</td>
<td>26. III.</td>
</tr>
<tr>
<td>1957/58</td>
<td>4.XI.</td>
<td>26. III.</td>
</tr>
<tr>
<td>1958/59</td>
<td>14.XI</td>
<td>20. III.</td>
</tr>
<tr>
<td>1959/60</td>
<td>26.XI.</td>
<td>21. III.</td>
</tr>
<tr>
<td>1960/61</td>
<td>13.XI.</td>
<td>27.II.</td>
</tr>
<tr>
<td>1961/62</td>
<td>22.X.</td>
<td>11.II.</td>
</tr>
<tr>
<td>1962/63</td>
<td>17.X.</td>
<td>2.II.</td>
</tr>
<tr>
<td>1963/64</td>
<td>9.XI.</td>
<td>4.III.</td>
</tr>
<tr>
<td>1964/65</td>
<td>10.X.</td>
<td>8.III.</td>
</tr>
<tr>
<td>1965/66</td>
<td>28.XI.</td>
<td>18.IV.</td>
</tr>
<tr>
<td>1966/67</td>
<td>12.XI.</td>
<td>15.II.</td>
</tr>
<tr>
<td>1967/68</td>
<td>16.X.</td>
<td>19.V.</td>
</tr>
<tr>
<td>1968/69</td>
<td>16.IX.</td>
<td>27.IV.</td>
</tr>
<tr>
<td>1969/70</td>
<td>18.X.</td>
<td>23.III.</td>
</tr>
</tbody>
</table>

Source: Spatial Planning, Urban and Projects Board, Prishtina 1984, pg.8. The chart was done by the author.

From the chart we can see that hoarfrost was earliest showed on 28th November 1965 and the latest on 19th May 1968 (lacking the latest data I have taken into consideration
these).

In the places where hoarfrost is frequent in the late spring and early autumn, the cultures should be planted later and be picked up earlier in the way that hoarfrost would not harm them. The places that are more frequently struck by hoarfrost are the plains near the flow of the rivers Drini Bardhe and Peja River.

4.2.5. Winds

The role of the winds is also important, notably the role of the permanent winds and seasonal winds. In this territory the most frequent winds are those that blow from South-West 88%, West 67% and North. The north-west wind has an average speed from 3.2 m/sec. The fastest winds are those of south-west and south 18.9m/sec or 69km/h. Rainfalls are present mostly from the north-west winds.

These winds are welcomed to be used for the benefit of wind energy as well as creating wind mills.

*Chart 12: The movement of winds in the Municipality of Peja, during 2002-2007*

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>IX</th>
<th>X</th>
<th>XI</th>
<th>XII</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>1.3</td>
<td>2.7</td>
<td>1</td>
<td>0.8</td>
<td>0.6</td>
<td>1.2</td>
<td>1.1</td>
<td>1.4</td>
<td>1.8</td>
<td>0.8</td>
<td>0.6</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>2003</td>
<td>1.4</td>
<td>0.9</td>
<td>1.6</td>
<td>2</td>
<td>1.7</td>
<td>1.3</td>
<td>1.6</td>
<td>1.1</td>
<td>0.8</td>
<td>1.2</td>
<td>1.4</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>2004</td>
<td>1.2</td>
<td>0.8</td>
<td>1.1</td>
<td>1.4</td>
<td>1.8</td>
<td>1.2</td>
<td>0.8</td>
<td>0.6</td>
<td>0.4</td>
<td>0.4</td>
<td>1.2</td>
<td>1.1</td>
<td>1.0</td>
</tr>
<tr>
<td>2005</td>
<td>1.1</td>
<td>0.9</td>
<td>0.6</td>
<td>1.4</td>
<td>1.2</td>
<td>1.5</td>
<td>1.3</td>
<td>1.6</td>
<td>0.9</td>
<td>0.8</td>
<td>0.7</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td>2006</td>
<td>1.2</td>
<td>0.8</td>
<td>1.1</td>
<td>1.4</td>
<td>1.8</td>
<td>1.2</td>
<td>0.8</td>
<td>0.6</td>
<td>0.4</td>
<td>1.2</td>
<td>1.1</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>1.3</td>
<td>1.1</td>
<td>1.2</td>
<td>0.8</td>
<td>1.4</td>
<td>1.3</td>
<td>0.9</td>
<td>1.0</td>
<td>1.1</td>
<td>0.9</td>
<td>1.3</td>
<td>1.5</td>
<td>1.2</td>
</tr>
</tbody>
</table>
4.2.6 Radiation

Radiation influences in the process of photosynthesis and in the establishment of plant’s mass. The annual average sum of radiation in the Municipality of Kline has not been measured and it is not given. Although, for directions datas for Peja can be taken due to the nearness and mostly identical orientation of the land.

<table>
<thead>
<tr>
<th>Months</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>IX</th>
<th>X</th>
<th>XI</th>
<th>XII</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiation</td>
<td>105.9</td>
<td>129.4</td>
<td>144.5</td>
<td>206.1</td>
<td>176.4</td>
<td>204.8</td>
<td>257.2</td>
<td>213.6</td>
<td>255.0</td>
<td>143.1</td>
<td>55.0</td>
<td>84.0</td>
<td>1973.2</td>
</tr>
</tbody>
</table>

Source: Spatial Planning, Urban and Projects Board, Pristina1984, pg.3. The chart was done by the author.
As we can see from the chart, the month with the longest radiation is July with 257.2 hours, while the shortest radiation is in the month of November with 55.0 hours. To sum up 1973.2 hours of annual radiation are very good conditions for application of solar energy usage, as for instance in street lighting by using this kind of energy.

### 4.3 The role of subterranean and above-ground waters in agricultural development

For agricultural economy of one place, waters play an important role. This role is universal and diverse because most of the agricultural products require enough humidity from which depends the development and its efficiency.

Drini Bardhe, Lumi i Pejes, Mirusha and Lumi i Istogut are the rivers that flow through the territory of the Municipality of Kline. From the above mentioned rivers, Drini is the longest river which has the direction of its flow in the northwest-southeast, while here it makes a turn in the direction of south. The river of Peja flows from west side in the direction of east until the village of Grabanica where it joins Drini Bardhe.

Kline River flows from the north-east in the direction of south-west where it joins Drini Bardhe near Deiq village below Kline dwelling.

Mirusha River flows from east in west direction where it pours in the Drini Bardhe at the Mrasor village in the south of the territory of the Municipality of Kline.

The river of Istog, flows from the northwest in the direction of southeast and near the village of Zllakuqan pours in the Drini Bardhe.

All these rivers in the territory of Kline are Field Rivers excluding Mirusha. Their flow is slow and thus it creates meanders, due to this fact erosive side energy is pretty big, notably at the river Peja and Drini Bardhe.

In spring and autumn when the rainfalls are heavy, respectively when the snow starts to melt these two rivers flood the plains near the coast causing big damages to autumn or
spring cultures by taking with itself the most qualitative soil and leaving behind the sand and rocks in the fertile lands.

This goes also for the river of Kline, Istog while the river Mirusha flows mostly through lime stones where it has created its valley in the form of canyon (Mirusha canyon).

Regarding the amount of water, the most fulsome river with water is Drini and Peja River, while during the summer Kline, Istogu and Mirusha have only a small amount of water.

On the economical point of view, Drini and Peja river are of a great importance due to the fact that these two rivers is evenly used for watering arable lands, meadows, orchards etc. In general these rivers in the territory of Kline have the lowest level of water in August and September, as a matter of fact that is the time when the rainfalls are minimal and their evaporation is high due to the high level of temperatures, however the water level is high during autumn especially in October and November.

The dwellers that have arable lands in the valleys of these rivers, rush to pick up their fruit in the season of autumn, notably in the places where floods are expected, while in spring frequently happens that the due to the high level of water the lands remain unplanted and the crops do not reach their ripeness. In this case many land owners are caused material damages because they do not succeed to harvest their crops.

In order to have a clearer view regarding watering as an important element in agriculture, for the pros and cons water can cause to a region during artificial watering, we should firstly look at the quality of watering water.

One of the most important scientific and research duties in the watering direction is the study of the water quality that lands are watered with. The familiarity of the quality of water is important notably in the regions where artificial watering is necessary, and where the population of that place and their lives depends on this element.

The valuation of the quality of watering water and its classification is based mainly in the amount and the sort of the minerals which waters bring with it, as well as what land they come from (the pedology of terrain). The amount and the sort of the minerals waters bring are important for the organic food of the plants and the physical-chemical fertilization of the land.
Chemical analyses for watering water have been made in many different regions of the world, from different authors and in different times, so it means that even the results and the methods are different.

According to EILEAXU the chemical analyses of water shows better its quality. Regarding this author the main water components are cations (Ca, Mg, and Na), anions (above carbonates, sulfats, and clorids).

The methods for determining the quality of water for watering are based in the amount of the harming minerals that water brings as well as their harm to the land and plants.

The classification of water for watering that was done Naigebeueri is based in the amount of dried dregs and the presence of some elements in them. If the dried dregs are smaller than the relationship between Mg, Ca and Na then the watering water is better for watering.

However according Eolcaxu there are to be known three other characteristics in order to determine the quality of water such as salt concentration, percentage of Na and the dry dregs concentration. All this can be clearly seen on the chart

*Chart 13: The concentration of metals, minerals and the amount of chemicals in rivers: Drini i Bardhe River, Peja River dhe Mirusha River.*

<table>
<thead>
<tr>
<th>Physical parameters</th>
<th>Drini Bardhe River</th>
<th>Peja River</th>
<th>Mirusha River</th>
<th>Allowed standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure places</td>
<td>Kepuz</td>
<td>Peje</td>
<td>Kepuz</td>
<td></td>
</tr>
<tr>
<td><strong>Physical parameters</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Time</td>
<td>11.3</td>
<td>14.2</td>
<td>13.3</td>
<td></td>
</tr>
<tr>
<td>2 Weather</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Odour</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Dry remains</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uninfiltration</td>
<td>354</td>
<td>313</td>
<td>458</td>
<td></td>
</tr>
<tr>
<td>5 Dry remains</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Filtrated</td>
<td>349.3</td>
<td>310.2</td>
<td>455.2</td>
<td>500</td>
</tr>
<tr>
<td>6 Temperatures</td>
<td></td>
<td></td>
<td></td>
<td>8 up to 12</td>
</tr>
<tr>
<td><strong>Chemical parameters</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 pH amount</td>
<td>7.43</td>
<td>7.35</td>
<td>7.48</td>
<td>6.5 - 8.5</td>
</tr>
</tbody>
</table>
The results up to now show that the water for watering the territory of Kline have small amount of dry waists. CaCo3 is the biggest waist participator which is also known that has influence in the land fertility as well as plant.

According to the analyses, all the waters for land watering in this geographic region are great, filled with lime that land needs, as this land lacks lime.

The quality and the amount of the waist of waters in these rivers is distinguishes during the year, for instance a big amount of waists and grounds come during rainy periods and melting period, due to these circumstances people water their plains immediately after heavy rains in order to fertilize the land. Except of acquaintance of water quality, it is of a
great importance to get to know the way of usage, the way of usage considering technical aspect of water supply in this terrain.

Klina has a sufficient supply of water from its rivers to build an adequate irrigation system. The construction of irrigation reservoirs with the water supplied by the four rivers that run through the fields will enable the irrigation of up to 2,000 hectares of agricultural soil.

In general the people in this region use the watering water in a classical way, not only in technical way but also in looking at its usage. Thanks to low elevation, where rivers flow and the river bottom is not deep (2-5 m), the easy possibility is that this water was used early. This means that the people have taken advantage on natural possibilities (hydrographical and morphological) of watering and they have built canals that helped them turn the water flow from the rivers and springs to their lands.

Even today the canals are narrow and not deep which people call”JAZ”. From”JAZ” (water concentration- dams) every house has its small canal from which turn the water in their lands.

Before in the territory of Kline have been watered 1800-2000 hectares of the agricultural land, thanks to five rivers that go through this region, where were built some dams, as well as canals for taking water to the watering areas.

*Chart 14: Dams through the rivers of the Municipality of Kline.*

<table>
<thead>
<tr>
<th>Dams</th>
<th>Lands watered before the war in hectares</th>
<th>Watered lands in hectares year 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DRINI BARDHE RIVER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balaj Dam</td>
<td>350 ha</td>
<td></td>
</tr>
<tr>
<td>Krusheve te Madhe Dam</td>
<td>160 ha</td>
<td></td>
</tr>
<tr>
<td>Zllakuqan Dam</td>
<td>380 ha</td>
<td></td>
</tr>
<tr>
<td>Videj Dam</td>
<td>180 ha</td>
<td></td>
</tr>
<tr>
<td>Zajm Dam</td>
<td>140 ha</td>
<td></td>
</tr>
<tr>
<td><strong>PEJA RIVER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poterç te Eperm Dam</td>
<td>100 ha</td>
<td></td>
</tr>
<tr>
<td>Dugujeve Dam</td>
<td>120 ha</td>
<td></td>
</tr>
</tbody>
</table>
Grabanice te Eperme Dam | 130 ha
---|---
Grabanice te Poshtme Dam | 70 ha
Uke Sahiti Dam | 70 ha
Dollova Dam | 150 ha

**KLINE RIVER**

<table>
<thead>
<tr>
<th>Dresnik Dam</th>
<th>160 ha</th>
<th>Total</th>
<th>1940 ha</th>
</tr>
</thead>
</table>

Total | 130 ha

*Source: The data are from the Directorate of Agriculture and Rural development and environment defense in Kline, 2001.*

From all the dams in the territory of Kline, only three have been built of concrete those of Balaj, Zllakuqani, and the dam of Dresnik, while all the other have been built in a classical way by the villagers.

After the war all the dams are out of use, they have been destroyed as a result of nonintervention of the maintenance in lack of instruments.

All the canals for directing the water to the watering areas have been in the ground, except in the dam of Dresnik which has been built above the Kline River, and has been approximately 1km of a concrete canal which has been destroyed pretty much.

The watering importance has caused confusion between families, however thanks to standards that watering has these quarreling was avoid. Patriarchal standards were taken from the “Kanuni i Leke Dukagjininit” (The canon of Leke Dukagjinini) which has been used until now. Every individual property has its watering schedule and this has to be respected regardless crops change or the owners. If the canal goes past somebody else’s land, he has to accept this due to the fact that it is a mutual interest.

These old rules are of a great importance even today because they interrupt quarrels, and who does not hold in to these standards the village isolates the family from any cooperation.

The turn of watering a.k.a. the time of watering is divided in hours according to the size of the property, usually to 1 hectare of land there are 4 hours available for watering. Before the turn for watering there is the pedological composition of the land that has to be considered, concretely firstly the stony field should be watered before the sandy field due to
the fact that stony field does not hold the humidity, therefore the watering turn is given to the family who has more land with pedological composition.

Depending on planted cultures, the land is watered circa three times, but it happens to be watered 4-5 times or only once monthly depending on climate conditions (rainfalls).

The vast place of this territory waters with three rivers as Drini iBardhe, Lumi I Klines and Kline.

**4.3.1 Hydrogeology**

The Drini Bardhe and the Peja River are the largest and second largest of 8 perennial rivers in the municipality, although flow rates can vary significantly during the year. Water flow in the Mirusha River temporarily decreased completely, during the summer of 2007. In terms of population, by far the largest number of people lives within the Drini Bardhe catchment, underlining its fundamental importance and priority as a source of water both for domestic supply and irrigated agriculture. Urgently needed are solutions to the pollution of all rivers but particularly the Drini Bardhe, Kline and Peja River by raw sewage discharge.

*Chart 15: Areas of the main river catchments within Kline and the percentage of total municipal area.*

<table>
<thead>
<tr>
<th>River Catchment</th>
<th>Population</th>
<th>Hectares</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lum bardhe/Bistrca</td>
<td>8364</td>
<td>8531.3</td>
<td>27.7</td>
</tr>
<tr>
<td>Drina i Bardhe</td>
<td>8750</td>
<td>4573.8</td>
<td>14.9</td>
</tr>
<tr>
<td>Istog/</td>
<td>1931</td>
<td>2554.4</td>
<td>8.3</td>
</tr>
<tr>
<td>Kline</td>
<td>4189</td>
<td>3483.2</td>
<td>11.3</td>
</tr>
<tr>
<td>Mirusha</td>
<td>2038</td>
<td>2879.5</td>
<td>9.4</td>
</tr>
<tr>
<td>Pasji Potok</td>
<td>41692</td>
<td>30760</td>
<td>100</td>
</tr>
</tbody>
</table>

*Source: ALUP*

**4.3.2. Subterranean Waters**

Considering the facts that subterranean waters are of a great importance for agriculture, human activities and supplying population with drinking water, in the territory of Kline subterranean waters have not been studied more, on the other hand above-ground waters have been more researched.
Surfaces with the most subterranean waters in the territory of the Municipality of Kline are those past the river flows such as Drini Bardhe, Peja River, Kline, Istog, and Mirusha. This wealth is about to be seen clearly anywhere where the land is dug as well as the vast number of the coulees which flow from the nature springs.

In the establishment of the subterranean water stratification/layer, mainly influence these elements: atmospheric waters, ground waters and deep waters.

Two first elements are present notably in the alluvial plains, where average deepness of the subterranean water is 3-5 meters, while the third element establishes the subterranean level of water only in the lake plain in an average deepness of 15 meters.

Subterranean water of the terrain is free water. Free water with the influence of above mentioned elements fulfills all the emptiness below a certain level, by establishing spring water by which the population of the Municipality of Kline is supplied with drinking water and less for watering.

As every other water the subterranean water has a sort of regime, it has its movement that changes during the year and depends on some elements. So, the movement of the subterranean water level depends on these elements. So, the movement of the subterranean water level depends on these elements:

- Atmospheric conditions (rainfalls)
- River floods
- Land watering
- Relief

Starting from the first element (rainfalls), exactly during the rainfall period, the subterranean water level rises at approximately 40cm, as the rainfalls fill every hollow place up to the irrigation reservoir layer. During the dry weather, this level is about 1-1.5 cm, while in the rainfall weather the level rises at about 30-50 cm.

The level of subterranean water changes even due to the river influence, exactly during its floods, mostly in the terrains where rivers flow. But this element is closely connected with the first element (rainfalls) as the rainfalls raise the level of river water, which later floods and saturates the land beside with water. The river floods increase the subterranean water level in this area for approximately 10cm.
Another element that determines the increase of the subterranean water level is the pedological composition.

In alluviums without carbonate the subterranean water is present in an average deepness of 4m, which tells the level of spring water in wells.

A phenomenon which is present, and as an element influences in the movement of subterranean water level, is the artificial land watering, which is mostly present in dry seasons.
4.4 The role of land in developing agriculture branches

In land establishment except of the natural elements, social element has a great influence too.

A miscellaneous land is a consequence of a different hipsometrical region, in which the relief, geological construction and climatic elements make it diverse and specific in every regional unit. We can add that the humans have interfered continuously for their needs in improvement of lands in order to produce agricultural cultures. All this process of pedogenesis has established a different land cover, which in fact resembles a mosaic.

Chart 16: The lands of this territory are very heterogeneous and consist of many types and sub-types:

<table>
<thead>
<tr>
<th>Class</th>
<th>Type</th>
<th>Sub type</th>
<th>Area Ha</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weak development</td>
<td>Alluvial lands</td>
<td>Alluvial clay</td>
<td>3.305</td>
<td>8.2</td>
</tr>
<tr>
<td>Of soils (A) C</td>
<td>Carbonates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Colluvial soils</td>
<td>Deluvial soils</td>
<td>191</td>
<td>0.5</td>
</tr>
<tr>
<td>Humus soils</td>
<td>Resinous lands</td>
<td>Non carbonated resins</td>
<td>1.529</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>Eroded resins</td>
<td></td>
<td>2.409</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td>Cultivated resins</td>
<td></td>
<td>4.533</td>
<td>11.2</td>
</tr>
<tr>
<td>Cambic soils (A) (B) C</td>
<td>Middle soils</td>
<td>Non farmed soil used for pastures</td>
<td>6.273</td>
<td>15.6</td>
</tr>
<tr>
<td></td>
<td>Grey non farmed soil used for pastures</td>
<td></td>
<td>1.835</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>Grey clay layers</td>
<td></td>
<td>382</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>Grey soils</td>
<td></td>
<td>1.947</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>Dry grey soils</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Barren land</td>
<td></td>
<td>2.234</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>Grey soils</td>
<td></td>
<td>382</td>
<td>0.5</td>
</tr>
<tr>
<td>Copper soils</td>
<td>Red layer soils</td>
<td></td>
<td>3.495</td>
<td>8.7</td>
</tr>
<tr>
<td>Red soils</td>
<td>Red soils</td>
<td></td>
<td>5.566</td>
<td>13.8</td>
</tr>
<tr>
<td>Clay soil</td>
<td>Non real clay</td>
<td></td>
<td>306</td>
<td>0.7</td>
</tr>
<tr>
<td>Rocky lands</td>
<td>Fertile</td>
<td>Barren land</td>
<td>1.543</td>
<td>4.0</td>
</tr>
</tbody>
</table>
Conditions for Development of Agriculture in the Municipality of Klina, Republic of Kosovo

Supervisor: Jan-Evert Nilsson
Author: Ferim Gashi

<table>
<thead>
<tr>
<th>Class</th>
<th>Area</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ha</td>
<td>%</td>
</tr>
<tr>
<td>1,2 and 3</td>
<td>11.692</td>
<td>29.01</td>
</tr>
<tr>
<td>4 and 5</td>
<td>10.420</td>
<td>25.96</td>
</tr>
<tr>
<td>6,7 and 8</td>
<td>18.188</td>
<td>45.13</td>
</tr>
<tr>
<td>Total</td>
<td>40.300*</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Spatial Planning, Urban and Projects Board, Prishtina 1984, pg.14. The chart was done by the author.

*Included is the area of the Klina Municipality before 1986.

1st, 2nd, and 3rd class of fertility scale lands have 29.0% from the farmed areas. These are alluvial, clay, carbonated, non carbonated resin.

4th and 5th class of fertility scale lands enter the grey lands (red lands) which include about 25.9% of arable areas.

4th and 5th class of fertility scale lands for the intensive usage require adequate rates for their maintenance and methods.

The type of land which is called “rendezina” (a non arable land but they are used for pastures) (6,273 hectares) is the most frequent and therefore they enter in the class 4-6 of fertility scale which are lands with minerals-swamps and non real clay. There are approximately 4 000 hectares of this kind of land.

Mineral-swamps and non real clay lands are expanded in the lowest parts of the terrain which are now used as natural meadows from which due to the hydro plants vegetation hay is produced. After the decrease of the subterranean water level and the adjustment of the river bottom, respectively physical quality of water they can be easily converted or transformed in arable lands.

The pedological consistence in the development of the agricultural products in the territory of the Municipality of Klina has been studied according to the expansion of the agricultural cooperatives. Thus for instance 80% of the land that Budisale agriculture co-op includes belongs to the alluvial type of the land. This land has been created by the
accumulation of different materials which has been carried by the river Drini Bardhe and regarding the consistence and the aspect it is very heterogeneous.

Other characteristics of this kind of land are the layers that are more expressed in the profile. In this surrounding mostly dominates sandy alluvial with a small water capacity which briefly evaporates and the plants do not resist the dryness which means that during the period of vegetation a frequent watering must be done. From chemical point of view this land is very diverse. It has much less calcium carbonate and if it is present somewhere it is mixed up with humus which is also a little and it is extended through all entire profile. It can be found in big amounts in the deepness more than in the surface.

Regarding nourishing matter nutritionist matters for plants, this land is different, but since it is fertilized with manure it does not cause many problems. Regarding attributes that this soil has it is mostly convenient for cultivating sugar cane, leguminous plants (a plant that has its seeds in a pod, such as the bean or pea) while for wheat cultivation it takes the third place.

In the lands of Zllakuqan agricultural co-ops and in the shores of the Zllakuqani village red land (smonica-Albanian word for red land) is dominant. These types of land are important by using agricultural ways. Red land as it is in Zllakuqan village is degenerated contains itself much less nourishing matter. In this land corn and sugar cane is mostly grown while wheat and other plants are less grown. Some places are inconvenient for growing any sort of plants because the water is very near the land. The land belonging to agriculture cooperative of Ujmir some dominant types of lands are present like: Red land, which covers the biggest part, eroded land etc.

Eroded land belongs to A-C category of land, which has a shallow horizon of humus and fruit are grown mostly while the other plants are grown with difficulties. Red land takes part in the land that is middle worth land for farming. Thus in these lands many different agricultural products can be cultivated

In the south of Klina in the both sides of the river Drini Bardhe, are expanded lands that belong to agriculture co-op Lavra from Klina. This is an alluvial land too and much fertile as well as it is a land that is convenient for all kinds of plants.

In the west of Klina lands that belong to agriculture co-op Drenovc are situated. The land that belongs to drenovs village is one of the weakest lands, as regarding physical and
chemical way, while the other part which is watered is convenient for growing all the sorts of plants.

The most fertile land is the one that belongs to Grabanica village but however it has one of the biggest disadvantages which are when river Peja frequently flows out of its flow and it ebbs late so it causes agricultural damages.

In the 80ties in this territory used to start a vast planting of sugar cane, while in the 90ties there was a vast decrease of this product due to the exile of many people.

11-Map Klina 8 Class Soil Suitability
4.5 Flora and Fauna and its role in development of specific branches

The flora of the region of Kline is an expression of many elements that always change in the land.

The vast part of the territory of the municipality of Kline consists of alluvial plains and arable lands. A small part is under lime hills and woods. Average elevation is 300 meters. It has a medium climate which is influenced by Mediterranean climate that comes through river Drini Bardhe from the Mediterranean Sea. This territory is covered by rivers and the most important of them is Drini Bardhe where all the other rivers (river Istog, Peja River, and Mirusha) pour and cover this territory.

With its physical and geographical attributes the territory of Kline has convenient conditions for development of flora and fauna. The differences of elevation from 300 to 800 meters make it possible to have a various flora and fauna.

Agricultural areas which at the same time are used as economical areas cover an area of 30,832 hectares.

Arable land and gardens cover the biggest percentage of these areas of 12,824.13 hectares or 41.6%. This land is cultivated by wheat, industrial plants, and animal's plants. 540.07 hectares or 11.75% is orchard thus Kline is known for its quality fruit and vegetables. From the fruit, apples and plums and from the vegetables is cabbage that is vastly cultivated due to its quality.

In this territory, vineyards include an area of 94.21 hectares.

Paddocks and pastures cover 4,308.81 hectares or 13.7% of the land. As permanent green covers paddocks and pastures, regarding biological aspect they indicate the most endurable category of agriculture areas and they are a good natural regenerator of positive land attributes and maintenance and balance of nature of course immediately after forests.

In the lowest area of the plain, the presence of great humidity and light, the thermal convenience have joined in three main factors for developing vegetative cover. These are the space of plains and lands around which are high willows and alders.

The importance of plants respectively of the products in this part is bigger considering all the conditions for this land usage.
The potential possibility for orcharding development is of a great importance not only for the areas but even for their sorts. It is worth mentioning apples, nuts, plums, pears and cherries that are vastly grown and near the dwelling places sturgeons and poplars are grown.

Hilly area has a miscellaneous vegetation of many types. Forests of oak are greatly extended, and in the dwelling places hawthorn, gooseberries and briers.

With agriculture development, it is foreseen that arable lands will be extended in drawback of orchards and paddocks and pastures, while with dwelling expansion arable lands and orchards will decrease which will influence in instability of ecosystems.

Forests as unused economical areas are seen in the sunny sides and are grown by ash-trees and black hornbeams.

These forests are mainly low and are very opulent. Mutual height of these trees is very big therefore it makes possible the growth of bushes and the herbs.

The rivers and springs of this territory are populated with many kinds of creatures due to the fact that there are optimal conditions for their development and their cultivation. Fish are present in these waters and from them eel, trout and Danube trout are more present which time to time they are present in the waters of Drini Bardhe. Except of fish frogs, turtles and crabs are present.

The municipality of Kline has natural conditions for developing tourism and hunting. Prosperous forests has influenced that this territory is luxuriant with boars. The Mirusha and Drini Bardhe canyons with their vegetation are very attractive for developing boar hunting.

Areas with meadows, pastures and bushes make great conditions for development of hunting rabbits. In this territory there are also present wolves, foxes, squirrels and badgers. From the wildfowl there are woodpeckers, nightingales, pheasants, owls, grouses. The seasonal birds are cuckoo, hawk, bullfinch etc.
5. Social elements in the development of agriculture

Natural conditions pose the basis for localization of primary activities of the agriculture of the farms and forest organizations, while the socio-economical elements influence in its development and progress.

5.1. Land reserves and its role on development of agriculture

The way of usage of arable land areas is one of the elements which determine not only agrarian density but agriculture profile too. In the category of arable lands dominate gardens, paddocks, groves; vineyards with 50.7%, while in the category of barren lands dominate forests with 37.5% of the area.

Figure 8: The structure of utilized lands in the territory of Klina Republic of Kosovo, 2008

The structure of utilized lands in the territory of Klina and Kosovo, 2008

![Chart 18: Land Areas in the Municipality of Klina and Republic of Kosovo, 2008](chart.png)

<table>
<thead>
<tr>
<th></th>
<th>Municipality of Klina</th>
<th>Republic of Kosovo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total area</td>
<td>30849.85 ha</td>
<td>1,089,500 ha</td>
</tr>
<tr>
<td>Arable Land</td>
<td>15343.03 ha</td>
<td>311,538 ha</td>
</tr>
<tr>
<td>Meadows</td>
<td>2243.00 ha</td>
<td>87,470 ha</td>
</tr>
<tr>
<td>Barren land</td>
<td>1498.7 ha</td>
<td>178,309 ha</td>
</tr>
<tr>
<td>Forests</td>
<td>11765.12 ha</td>
<td>512,183 ha</td>
</tr>
</tbody>
</table>

Source: KCA, 2008. The chart is done by the author.
The municipality of Klina has an area of 30,849.85 hectares. From this area, 29,351.15 hectares or 95% are agricultural lands, while 14,987.7 hectares or 5% is barren land (1% from the overall barren land of Republic of Kosovo). 15,343.03 hectares is of arable land or 50% while 11,765.12 (5% from the overall arable land of Republic of Kosovo) or 38% is forests (2% from the overall forests of Republic of Kosovo), 2,243.00 hectares or 7% is Meadows from total agriculture area (3% from the overall meadows of Republic of Kosovo).

From the chart we can see that of arable lands mostly there is 12,743.04 hectares or 41.34% of plain, while the other part of this area is planted with fruit of 508.79 hectares or 1.65%, vineyards 59.81 hectares or 0.19% and meadows 2,184.82 hectares or 7.09%. The minimal area is consisted by gardens with 25.57 hectares or 0.08%. This gives us to understand that the population of this municipality has given more of its importance to the crops.

Regarding 2008, in the private sector are planted 84.3% or 10,745 hectares. The vast part is planted with wheat 4,210 hectares or 39.2%, corn 3,850 hectares or 35.8%, oat 290...
hectares and barley 915 hectares, fodder plants are of 480 hectares or 4.4%, vegetables 360 hectares or 3.3% and fruit 650 hectares or 6.10%.

Figure 9: Inseminated areas in the private sector regarding 2008

Source: Agriculture, rural and environmental development directorate, Kline, 15.09.2008. The chart was done by the author.

In the public sector arable lands consist of 95.7% or 2964.86 hectares from the infield. Fruit and vineyards are of 20 ha or 0.64%, paddocks 3.5%, gardens are less with 0.06%, respectively 213 ha.

Public sector as in forests, lands, vineyards are is extremely on the edge as a consequence of discriminating methods of the violent administration of Serbs and the war in Kosovo. In 2001 most planted was wheat (200 ha) and barley (200 ha) altogether 400 ha or 13.5%.

In general, plants in the territory of Klina are inseminated there where minimal conditions exist in order for them to give their product, notably crops.

According to some studies that were done by the experts of agriculture in the territory of this municipality, crops, industrial plants and those plants of animals can be inseminated and from them can be expected good fruits in the valley of Drini Bardhe and the River of Peja. These valleys in fact are alluvial plains as well as the vast parts of them are watered.
In the hilly side different plants are inseminated but their product depends on the rainfall of summer. This kind of division is reasonable because these are main regions of this municipality that differ from inseminated areas with plants and products that they give within one year.

Corn takes the first place from the plants which are inseminated in this territory. This is reasonable up to some extend due to the good conditions for its growth, then comes wheat which is mainly planted in the hilly area.

Industrial plants are planted in the valleys of Drini Bardhe and the River Peja however the characteristics is that they are not planted in vast areas except in the public properties.

Also efforts are made for choosing more qualitative seeds of the crops that are planted in this municipality. Thus until now this has been implemented successfully in the areas planted with wheat.

The characteristic of this territory is that fruits are planted in smaller areas comparing to good conditions that dominate. The reason is that there is no tradition for planting bigger areas except for family needs.
6. Agriculture branches in the Municipality of Klina

6.1. Land cultivation

Land cultivation is the most important branch of agriculture in the Municipality of Klina. Planting structure is represented most by grains, vegetables, industrial plants and animal plants.

Despite problems like lack of agriculture mechanism, lubricant oils, and other factors of different nature, it was achieved to be planted 6183 ha or 63.1% of the overall arable land in the private sector while in the public sector 350 hectares or 11.8%.

<table>
<thead>
<tr>
<th>Planted area</th>
<th>Private sector</th>
<th>Public sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>In hectares ha</td>
<td>In hectares ha</td>
<td></td>
</tr>
<tr>
<td>Corn</td>
<td>3850</td>
<td>/</td>
</tr>
<tr>
<td>Wheat</td>
<td>4210</td>
<td>200</td>
</tr>
<tr>
<td>Oat</td>
<td>290</td>
<td>/</td>
</tr>
<tr>
<td>Lucerne</td>
<td>480</td>
<td>/</td>
</tr>
<tr>
<td>Barley</td>
<td>915</td>
<td>150</td>
</tr>
<tr>
<td>Vegetables</td>
<td>340</td>
<td></td>
</tr>
<tr>
<td>Fruit</td>
<td>660</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>10745</td>
<td>350</td>
</tr>
</tbody>
</table>

Source: Agriculture, rural and environmental development directorate, Kline, 15.09.2008

From the chart we can see that there are 4210 hectares or 39.2% planted with wheat, corn with 3850 hectares or 35.8%, oat (290 ha) and barley (915 ha) 1205 hectares altogether or 11.2%, fodder plants 480 hectares or 4.4%, vegetables 360 hectares or 3.3%, fruit 640 hectares or 6.10%.

6.2. Horticulture

Even though in the Municipality of Klina are very good conditions for planting vegetables, this branch is not developed. It is more concentrated in the private sector. A vast extend of this branch is more concentrated by the rivers of Drini Bardhe and River Peja. This can be seen in the map of gardens due to the properties in the Municipality of Klina.
2008 there were 360 hectares or 3.3% planted with peppers, tomatoes, cucumbers, potatoes, onions, garlics, water melons, melons and cabbage.  

All these products are planted mostly for family needs while for trade needs more are planted cabbages (more in the village Gremniki which is very famous for cabbage quality not only in this municipality but all over Kosovo) peppers and potatoes.

6.3. Fruit farming

Fruit farming in the Municipality of Klina is represented mainly in the private sector and less in public sector where it takes 650 hectares or 6.10% from the overall areas of land.

According to the numbers of fruit, apples take the first place while tiny fruit like cherries are not in vast numbers although there are good conditions for growing them.

Investigations have shown that this area has very convenient conditions for development of fruit farming in contemporary plantations notably tiny fruits (berries) like strawberry, raspberry, grapes etc. and stony fruits like cherries, peach, apricots etc., and hard shell fruit like hazelnuts, walnuts etc.

6.4. Stock farming

Stock farming in the municipality of Klina is in “stagnant time”, the race composition of stock farming in inconvenient while product quantum and oscillations are big. The reason for such condition is that except of the damages created during the war the main reason stands in the socio-economic measure, respectively in material conditions of agriculture. Stock farming conditions are convenient for its development where there are 2043.00 hectares of pasture and 2184.82 hectares of paddock which gives us to understand that there are good conditions for development of stock growing.

From the stock farming reserve cows are spread with 47.7%, pigs 36.6%, sheep 9.5%, horses 2.9% and goats 3.3%. Poultry is represented with 8.6% in Dukagjini Plain (according to 1981 Dukagjini Plain had 453.190 fowl).
### Chart 21: Stock reserve in the Municipality of Kliena in 2001

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Dwellings</th>
<th>Cows</th>
<th>Sheep</th>
<th>Goats</th>
<th>Pigs</th>
<th>Hoares</th>
<th>Hens</th>
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<tr>
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<td>4</td>
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<tr>
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<td>Dolove</td>
<td>145</td>
<td>55</td>
<td></td>
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<td>6</td>
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<td></td>
<td></td>
<td>226</td>
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<td>957</td>
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<tr>
<td>7</td>
<td>Deiq (Novoselle)</td>
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<td>2</td>
<td>316</td>
<td>5</td>
<td>1987</td>
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<td>8</td>
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<td>6</td>
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<td>164</td>
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<tr>
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<td>50</td>
<td>57</td>
<td>42</td>
<td>1794</td>
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</tr>
<tr>
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<td>Grabanice</td>
<td>137</td>
<td>2</td>
<td>8</td>
<td>12</td>
<td>765</td>
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<tr>
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<td>Gjurgjevik i madh</td>
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<td>55</td>
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</tr>
<tr>
<td>16</td>
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<td>22</td>
<td>Kline vc</td>
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<td>Rudice</td>
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<td>Poterqi Eperm</td>
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<td>Siqeve</td>
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### Conditions for Development of Agriculture in the Municipality of Klina, Republic of Kosovo

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<th>No</th>
<th>Village</th>
<th>Cows</th>
<th>Pigs</th>
<th>Sheep</th>
<th>Horses</th>
<th>Goats</th>
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<td>34</td>
<td>4</td>
<td>592</td>
<td></td>
<td></td>
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<tr>
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<td><strong>Total</strong></td>
<td>7588</td>
<td>1510</td>
<td>523</td>
<td>5799</td>
<td>456</td>
<td>39035</td>
</tr>
</tbody>
</table>

*Source: Veterinary station in Klina*

From the chart we can see that this municipality is mostly famous for cows, pigs, sheep and least for horses and goats.

Villages that have up to 50 heads of cows are Drenovc and Dolce with 22, Dushi 25, Poterci I Ulet 42 and Berkova 50 cows. In these villages there are 199 cows or 2.5%.

The peasants that have 50 up to 297 heads of livestock are 32 villages with 4994 heads respectively 65.4%.

While the villages that have more than 297 heads are: Shtupel (3342 heads), Zllakuqani (348 heads), Gllareva (480 heads), Krusheva e Madhe (485 heads) and Sferka (740 heads). In these five villages there are 2395 heads or 32.1%.

The villages that have more sheep are: Sferka, Perqeva, Volljaku which are in southeast of Klina. In these three villages there are 855 sheep or 56.7%.
In the villages where forests and pastures are dominant have influenced on expansion of goats. Villages that have more goats are: Sferka, Cupeva, Perqeva, Gllareva and Dollova where are grown 389 heads or 74.4%.

Pigs are expanded in those places where most of the population is Christian like: Krusheva e Madhe (1265 heads of pigs), Zllakuqani (818 heads of pigs) Budisalci (622 heads of pigs). In these villages the number of the pigs is 2705 or 46.6%.

There have been taken some steps towards building some farms in this territory, in this way there have been given possibilities of taking loans form the banks, which besides are very rarely taken and supported by the dwellers of this municipality mostly in the hilly-mountainous villages.

6.5. The forestry sector

From the overall area of Municipality of Klina which is 30799.85 hectares, forests include 11735.12 hectares or 38.2%.

Forests and forest lands in the Municipality of Klina include central part of the region of Dukagjini Plain. In these areas there are mainly forests with oaks and wild pomegranate.

The forests are very closely grown due to the orographic conditions, while forest expansion through the villages has influenced illegal deforestation which has led to degradation of the vast forests.

From the total area of forests 11735.12 hectares, there is a 6747.25 or 54.9% hectare that belongs to public sector, while the other part of 5287.87 hectares or 45.1% belong to private sector.

In the territory of the Municipality of Klina there is a high growth of forests, thus their condition from economical point of view is unsatisfactory due to the overall economic effects which impacts forestry on general economy of the municipality which are relatively low.

The condition of forests in private sector is weak enough due to the non adequate governing with them. The present conditions of forests and forest funds does not fulfill its needs with woods neither can in general its functions be used.
Regarding forests experts’ estimations, forestry in the Municipality of Klina is much damaged in about 70% of the area. The forests have been damaged in the pre war period, respectively during the violent administration of Serbs, and in the post war period the forests have been damaged by irresponsible people. Recently the forests are being destroyed mostly by the fire, for instance in the villages of Dollove, Volljake and Perceve several hectares have been destroyed by the fire.

A 2001 Forest Sector Study estimated that some 40% of public forests and 29% of private forests in Kosovo have been subject of uncontrolled or illegal harvesting activities.

The inventory results also confirm expert opinions that coppice forest, especially public owned, is exposed to heavy harvesting for firewood. The results also show that many young and middle-aged forests are in urgent need of management interventions, ranging from cleaning/pre-commercial thinning to commercial thinning. It is expected these general observations are also valid in Kline.

### 6.5.1 Forest cover and land ownership

Although forest land accounts for nearly 10,000 hectares or more than 30% of Kline municipality (36% - or more than 11,500Ha, if scrub land is included), its quality and productive capacity is very low.

KFA confirms that there are not any timber resources of any commercial value in Kline, although it is claimed that there are 1000 Ha of 13 good condition years old forests (22 years remaining before harvest) still intact and in stands north of the Peja / Prishtina road and the Adem Galica stone quarry areas. Most of the remaining forest covers stands of coppiced oak which have very low timber volumes and suffer from neglect in thinning and lack of a proper forest management regime.

### 6.5.2 Forest resource assessment

There is widespread reliance in rural Municipality of Kline on coppiced trees as a source of fuelwood for heating and cooking in the months of winter.
A brief visual assessment of forest quality in Municipality of Kline shows that all forest, especially that under KFA management is in a much degraded state, unlike private owned forests which are in a better condition. Public forests, private and public land need investment in forest management.

On Chart 21 are listed land cover types which are grouped by category of land ownership. It shows that 22,199 Ha of land in the private sector more than 500 Ha or 22.9% of this is forest.

### Chart 22. Land use types in Kline (2001): land area (ha and percent) according to ownership and as a percentage of total

<table>
<thead>
<tr>
<th>Land Use Type</th>
<th>Ownership</th>
<th>%</th>
<th>Area (Ha)</th>
<th>% of land use type per ownership</th>
<th>% of total land use type in Kline per ownership.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>KFA Land</td>
<td>61.8</td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>KFA Land</td>
<td>511.1</td>
<td>10.3</td>
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<td>KFA Land</td>
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<td>71.2</td>
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<td>Grassland</td>
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<td>9.0</td>
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<tr>
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<td>KFA Land</td>
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<td>4.0</td>
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<td>Scrub</td>
<td>KFA Land</td>
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<td>4.0</td>
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</tr>
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<td>Urban</td>
<td>KFA Land</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td>15.8</td>
<td>4,971.5</td>
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<tr>
<td>*</td>
<td>SOE Land</td>
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<tr>
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<td>9.8</td>
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<td>SOE Land</td>
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<td>0.0</td>
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<tr>
<td><strong>Subtotal</strong></td>
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<td>13.8</td>
<td>4,363.8</td>
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<tr>
<td>*</td>
<td>Private Land</td>
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<td>1.3</td>
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<td>Agriculture</td>
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<td>70.4</td>
<td>22,199.3</td>
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<tr>
<td><strong>Total Land Cover</strong></td>
<td></td>
<td>100</td>
<td>31,534.6</td>
<td>100.0</td>
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</tr>
</tbody>
</table>

*Source: ALUP*

Due to the local economy there are many problems which face forestry, however the most important according to local KFA staff is illegal extraction of timber which is widely
spread and is used mostly for sale and as fuelwood thus KFA has some plans to prevent these illegal activities by reforestation, however in 2001-2006 60Ha of land were reforested with assistance from FAO.

Due to the lack of overall national forest policy and strategy, long term and sustainable rural development is limited, thus it is seen that such policy is the only method to succeed in protecting and managing the forest as a sustainable resource.

Under the current situation, regeneration of forest is impossible as long as the illegal harvesting and sale of fuel wood provides for many citizens the only available source of income in Kline municipality, who’s estimated rural unemployment rate runs as high as 80%.

- **Coppiced forest as source of fuel wood**

  The very poor quality of forest and long period before timber wood harvesting can take place minimizes short term economic rewards of forestry and stands against the possibility of forestry gaining as a significant part of the economy apart from a source of fuel wood and low income for the very poor.

  One possibility of using forest in a way that does not impose a 25 year waiting penalty involves the use of coppiced forest to produce energy for fuel wood heating boilers. For this to take place, a particular type of boiler (a fuel wood boiler) is required that consumes the wood in an efficient manner. Installation of such a boiler in a part or parts of the municipality would create a ready local market for coppiced timber with rotation as little as 5 years.

- **Local fuel wood market as a solution**

  The municipality should seek grant funding for at least one fuel wood boiler for public premises in Kline municipality. Installation of this would immediately create a permanent local market for low value short rotation fuel wood from coppiced land and increase the economic value of preventing timber theft.
7. Forestry Development and Action Plan

7.1. Forest on Private Land

By providing assistance to owners of private forest land like seeds, gadgets in general would be a step towards improving the economic performance of the forest sector as well as by establishing a private owners association that would form a local partnership. By far the largest proportion of forest land occurs on privately owned land that is more than 5000Ha or 50% of all forest land being on land that is only 3,000Ha on land that is administered by KFA. Considering this 1,524Ha is under private ownership which is heavily degraded forest.

The RLMP recommends that the 6507 hectares of forest on private land is managed sustainably as forest, and this includes enrichment planting of 1437.4 hectares of land classified as severely degraded forest or 'scrub'.

Source: ALUP
7.2. Forest on state owned land (KFA)

KFA which is a national organization for implementing forest management is responsible for ensuring land under its control is managed correctly as forest and performs well economically. Presently some of the land within KFAs jurisdiction is non forest, including village land and quarries, and it is appropriate that such land should not be included within KFAs management area. Non-forested land, including agricultural land and grassland that lie within KFA boundaries should be either planted or degazetted entirely as forest land.

Chart 25: Forestry components of the RLMP on KFA Land

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<th>Forest on KFA Land</th>
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<td>Other Use - convert to SFM or redefine ownership (degazette)</td>
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<tr>
<td>Enrichment Planting</td>
<td>671</td>
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<tr>
<td>Convert to Sustainable Forest Management</td>
<td>569</td>
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</table>

Source: ALUP

As the national organisation for implementing forest management, KFA is responsible for ensuring land under its control is managed correctly as forest and performs well economically. Currently some of the land within KFAs jurisdiction is non forest, including village land and quarries, and it is appropriate that such land should not be included within KFAs management area. Non-forested land, including agricultural land and grassland that lie within KFA boundaries should be either planted or degazetted entirely as forest land.

Chart 26: Forestry components of the RLMP on KFA Land

<table>
<thead>
<tr>
<th>Forest on KFA Land</th>
<th>Hectares</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implement Sustainable Forest Management</td>
<td>3,442</td>
</tr>
<tr>
<td>Other Use - convert to SFM or redefine ownership (degazette)</td>
<td>214</td>
</tr>
<tr>
<td>Enrichment Planting</td>
<td>671</td>
</tr>
<tr>
<td>Convert to Sustainable Forest Management</td>
<td>569</td>
</tr>
</tbody>
</table>

Source: ALUP
7.3 Forest on SOE land

The 308 Hectares of ‘low’ forest on SOE land should be managed according to SFM principles to ensure its maximum economic productivity while the 425 Hectares of very degraded forest on SOE land should be enriched to ensure its future viability as forest land. Some of the forest areas are sufficiently large to justify significant investments in improving the number and quality of growing stock, while some of the smaller sites would be more effectively managed as wood lots for domestic consumption.

*Chart 27: Areas Planned as Sustainably Managed Forest SOE*

<table>
<thead>
<tr>
<th>Socially Owned Enterprises Managed Forest</th>
<th>Area / Ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dollova_Qeskova / Bujqesia_Peje</td>
<td>323.6</td>
</tr>
<tr>
<td>Budisalc / Bujqesia_Peje</td>
<td>101.3</td>
</tr>
<tr>
<td>Bingia / NPB_Malishgan</td>
<td>71.3</td>
</tr>
<tr>
<td>Grabanica_Gillogani / Bujqesia_Peje</td>
<td>30.1</td>
</tr>
<tr>
<td>Drenovc / Bujqesia_Peje</td>
<td>29.2</td>
</tr>
<tr>
<td>Zajmi / Bujqesia_Peje</td>
<td>18.1</td>
</tr>
<tr>
<td>Parallov / NPB_Malishgan</td>
<td>12.5</td>
</tr>
<tr>
<td>Jovanica / NPB_Malishgan</td>
<td>11.4</td>
</tr>
<tr>
<td>Gremnik_vishnje1 / NPB_Malishgan</td>
<td>6.4</td>
</tr>
<tr>
<td>Poterq/lablanice / Bujqesia_Peje</td>
<td>6.2</td>
</tr>
<tr>
<td>Dushi1 / NPB_Malishgan</td>
<td>5.2</td>
</tr>
<tr>
<td>Dushi_Resnik / NPB_Malishgan</td>
<td>3.9</td>
</tr>
<tr>
<td>Dollova_Qeskova1 / Bujqesia_Peje</td>
<td>3.9</td>
</tr>
<tr>
<td>Berkoave_Kosh / NPB_Malishgan</td>
<td>2.7</td>
</tr>
<tr>
<td>Zllakuqan_lajthija / NPB_Malishgan</td>
<td>2.1</td>
</tr>
<tr>
<td>Gremnik_vishnje2 / NPB_Malishgan</td>
<td>1.9</td>
</tr>
<tr>
<td>Private Land</td>
<td>1.4</td>
</tr>
<tr>
<td>Renove / NPB_Malishgan</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>308.5</strong></td>
</tr>
</tbody>
</table>

*Source: ALUP*
7.4 Constraints to forest sector development

The problems that face the forest sector in Kline are common to all municipalities in Kosovo, and can be summarised as follows:

- Widespread illegal extraction of fuel wood and timber from KFA land
- Inadequate protection of forests.
- Absence of forest management plans.
- Insufficient KFA manpower and resources
- Small scale of forest landowners who are unable to benefit from forestry

The above problems are dealt with a very few local actions. For instance there is a poor infrequent rural water supply that is very important for establishing successful forests. In addition between 2001-2006 although KFA planted 60 Ha of land in the Mirusha Gorge...
area, 60% of seedlings died due to lack of water. The lack of forest management advice and support may negatively affect successful establishment of new forest plantations especially on privately held and SOE land. Then the absence of appropriate resources, professional forest management advice, access to mechanized tools and the equipment for thinning, seeds etc, negatively influences the ability of local communities to improve the quality of growing timber.

7.5 Potential for community involvement in forest sector development

Improving forest management on state owned land through the leasing of KFA land to private owners.

From field observations in Kline it is typical that forest on private land is of much higher quality than forest on state (KFA administered) land. Logically we can suggest that for improvement of forest management in Kline municipality could be done by involving land owners in management of KFA land.

Therefore the municipality should consider a proposal of a long term leasing agreement that keeps the land under state control, but rewards the leaseholder (private citizen) for maintaining the forest in a good condition by providing (limited) access to timber and firewood at pre-harvesting thinning times.

The terms of the lease and setting up the forest leaseholders should be carefully prepared with the participation of KFA these forest leaseholders would have to function as local forest guards in order to prevent or minimise the ever-present risk and ongoing extraction of timber by unauthorized individuals.

Private forest landowners would be able to access the resources of KFA in both forest management planning and in the harvesting of timber, paying for this.

7.6 Forestry Project Proposals

Wood is a major source of renewable heat energy and burnt efficiently, it produces virtually no smoke and no acid rain. Short rotation forestry and short rotation coppice trees can be purpose-grown for energy. The large forest area grown as coppiced woodland in Kline indicates potential to become a major supplier in woodfuel (renewable heat from
biomass). Forest plantations can be managed to produce woodfuel with short term rotations from 11-13 years. Recycle wood from the parts of harvested timber trees that are not suitable for saw timber also a potential source of energy.

The municipality of Kline will be eligible for structural funds when Kosovo enters the EU pre accession phase using IPA (Instruments of Pre-Accession) funding under a number of current programmes. The EAR funded Local Development Strategy (LDS) project is currently preparing Kosovo municipalities for this. EU provides funding towards the development and capital costs of renewable energy projects for communities, as well as assisting technical assessments of project feasibility. Support may be allocated to wood-fueled community projects, including district heating schemes such as those in schools community centres and public buildings.

7.7 Forestry Action Plan

Initiatives are needed in order to encourage the establishment of small scale forestry enterprises. Small forestry enterprises can influence the local economy only if the local market conditions are sufficiently favorable. The action plan develops ideas on how to create revenues for forest owners who want to restore degraded forests.

The municipality should prepare and submit a proposal to Kosovo Forest Agency that would result in preparation of a draft agreement between rural landowners and Kosovo Forest Agency. This proposal would describe how forest land that is presently legally administered by Kosovo Forest Agency could be leased by rural landowners.

The municipality should seek capital grant funding for the acquisition of biomass heating boilers for selected public centres or schools.

8 Agricultural Action Plan

Municipal Agricultural office presented the agricultural action plan for Kline in two workshops. Its main focus is on the following factors:

- How to improve the productivity of farming
• How to deal with the pollution of water, land and soil
• How to deal with the loss of agricultural land through construction
• How to improve the marketing of agricultural produce
• How to mobilize investment capital for the agricultural sector
• What off-farm income opportunities are available?
• Farmers organizations

8.1 On Farm Productivity

For the future it can be expected that the subsistence farming sector will diminish, as new off-farm employment and income opportunities arise. The small scale farming sector will undergo a slow, but drastic changes. The challenge is to provide economic support to this process so that farmers can benefit from it and a sound and sustainable new farming sector can evolve.

Due to the fact that staple food products can be found on the local market. The farm can specialize which will lead to intensification, for instance now one can observe a preference of farmers for livestock production moreover for milk production.

The improved technology (e.g. high yielding cows, disease resistant varieties, more efficient machinery etc.) is a process which increases productivity in farming, which would follow the following 1) existing appropriate technologies have to be identified, 2) they have to be validated under Kosovo conditions and 3) they have to be introduced in the farming practice.

On external hazards

Several external hazards threaten agricultural production:

- Irrigation water from rivers is contaminated by sewage and waste. This means that farmers prefer to irrigate with ground water and have to pump it with high costs. They should just get up pressure on the political decision makers in order to improve the situation of black waters in rivers.
• Waste is often dumped in the country side. It spoils the landscape and can contaminate the soil. The polluters have to be made responsible to clean it up and farmers have to put pressure on politicians to enforce the existing laws. A public awareness campaign and public clean up are needed to be done accompany this. A coordinated event between municipality, schools and farmers could give the issue a push.

• Soil fertility is endangered by certain agricultural practices (erosion, drop in organic matter, wrong application of plant protection products). The law on agricultural land requires regular control, to be financed by the farmer. This provision is not widely known. An awareness campaign needs to inform farms and later it has to be enforced by the authorities.

Growing cities and villages and industrial cities are consuming agricultural land. This is currently happening in an uncontrolled way. Although farmers in particular cases benefit from selling agricultural land for high prices, it has also severe negative effects. Valuable natural resources are destroyed and the landscape is spoilt due to the building of different factories or houses, or blocks of flats on agricultural land.

8.2 On Marketing of Agricultural Produce

Marketing of agricultural produce is one of the most popular demands of farmers; however people often mean the price level, while talking about better marketing opportunities when it comes to planning future action. They do remember the “good old (Yugoslav) times” when the local cooperative used to buy the produce at a guaranteed price.

The group working on the agricultural action plan milk collection is highest prioritized due to the fact that milk production is typical product for small farmers. There are already four milk collection centres in Kline, but two or three more would be needed. Especially in the northern hilly areas, there are none and also in the mountain area of Perceve not milk collection is available.

In order to deliver it and receive a better price, farmers need to secure the quality of
milk such as bacteria or contamination. The requirements need investments on the farm, as well as technical advice, thus milk selling has to be guaranteed according to quality.

Nevertheless we can not neglect the improvement of the local cattle market, as there are many environmental threats through illegal slaughtering and waste disposal in the nearby Drini River.

There are several good examples in Kosovo, where local cattle markets were rehabilitated with relatively low investments, but with good results. The operators of the market need to be trained and an effective veterinary control established. The market needs to cover its running and capital costs through feeds charged to the customers.

In any case the market would need urgent improvements, especially a roof and better hygienic conditions. Similar to the cattle market, besides financing and improving the infrastructure, an efficient and effective management of the market needs to be established at the same time: guarantee of hygienic conditions, cleaning, cost coverage and the connection to a market information system would be objectives.

One cross-cutting issue, concerning all levels of the food chain is food safety. This is a complex, but highly important topic for the long term viability of the Kosova food sector. Action has to be started on all levels, lead by the public authorities and the agro-industry. If the Kosovo food sector cannot meet them, it will not succeed. Local actors have to get acquainted and start to do what is in their domain to meet these requirements. Cooperation with national projects is essential to get access to know how and training.

**8.3 On Investment Capital**

Also for this issue, farmers have to abandon the old idea of Agro-Kosova, which had supplied them with inputs and also with finance at often very favorable conditions. But also the banks need to learn that farmers are also business men and can be good customers.

This approach cannot be developed on the level of Kline itself. But Kline farmers and institutions can participate in activities and projects on national level. On the local level farmers need to get acquainted with the credit lines and the requirements of banks. Advisory help is needed to assist the municipality prepare investment projects so they can be easily appraised by the local banks and other financial institutions. Bank officers are often not
acquainted with the agricultural sector and often results in underestimation of the true business and investment potential. Two approaches are necessary to overcome this: firstly banks should decide on special agricultural credit lines and train their employees specifically to deal with this sector. Secondly the local farming sector and the banks should establish a line of communication, which enables both parties to better understand the possibilities of the other side. Regular meetings and events are necessary to establish trust and build up confidence over time.

8.4 On off-farm opportunities

Off-farm job and income opportunities have been and are still essential for the viability of small subsistence farms. Off-farm jobs are often providing the necessary cash income, while the farm provides food and housing. However jobs in the industry are currently very scarce in Kosovo. In rural areas these jobs are almost inexistent.

A potentially interesting field of rural off-farm occupation could be forestry. However forestry in Municipalty of Kline is currently of very low productivity and needs years to recover. In addition there is still of illegal cutting and selling of fire wood. It is unknown, but cannot be excluded that the rural population is involved in these activities. This must be stopped and the protection of forests must be enforced.

Another off-farm income opportunity is rural tourism. In other countries this provides jobs for many people, but in Kosovo it is still less developed. Some places have started in this direction, like restaurants along the river bench or kiosks near Mirusha Gorge. These attempts need to be carefully evaluated and brought into a concept, which combines the protection of the beauties of the landscape with the economic interests of the rural population.

8.5 On Farmers Organisations

The above mentioned priorities and projects will not be achievable, if farmers don’t take the initiative and a leading role in this process. Public services, projects, donors or any external assistance will fail, if farmers are not responding.
8.6 On Irrigation

In Yugoslav times there was intensive irrigated agriculture, and there are a number of physical structures on the Drini Bardhe. These structures, built in the 1960s are at Rodice, Bresnik, Zllakuqan, Grabanic e eperme and Grabanic e Ulet and provide take off points for a network of distribution canals. Maintenance of both dams and distribution network has now virtually collapsed and currently only 500 Ha of land is irrigated out of an area that was formerly almost 2000 Ha in size. Absence of reliable irrigation water supplies and dependence on rain fed supply is clearly a major constraint on farmers’ ability to respond to the market and make decisions that maximise profitability.

The practical options for expanding the availability of irrigation water as a development strategy needs to be reviewed carefully, taking the local market and farmers’ preferences into consideration. In practical terms as long as no improvement of irrigation water quality is achieved, investments in the irrigation systems is not recommendable. A systematic continued river and irrigation water quality monitoring programme is a necessity. Since the maintenance of dams may indeed be difficult for a farmers group, this maintenance may be contracted out to a contractor by the Irrigation Company. The Irrigation Company is responsible for the quality of work. Canal O&M remains the responsibility of farmers. Dam operation may be done by the farmers group supervised by the Irrigation Company or a (in future to be expected) river basin authority.

9. Industry role in development of agriculture

Among all non developed municipalities in Kosovo is the Municipality of Klina. In this municipality other economy activities are less developed. Until the end of 1980 Klina was without important industrial objects even though industry development relatively has good conditions.

In 1980 Klina had only two manufacturers which belong to industrial activity which were “Boks” mine and “Seperacioni”.

In the future industry should absorb the biggest part of investments, respectively it
should play its main role in development and backwardness which is present should be exceeded.

Due to the existing natural resources explored in the Municipality of Klina, the development of industry should be more intensive hence its further industrial development will be based mainly on agricultural raw material and raw minerals.

Its propitious geographical position, traffic possibilities and infrastructure as well as water supply will be a convenient element for setting future industrial capacities in the Municipality of Klina.

An important economical potential of this municipality is the agricultural areas. Farmed areas take more than 20,000 Ha considering its convenient climatic conditions and watering possibilities these areas are a vast potential for the development of Municipality of Klina.

It is foreseen that the areas which are below industrial plants include circa 15% of the farmed area (sugar cane, sunflower) which is a base for the development of capacities regarding raw material with agricultural origin.

All these make it possible for the development of food industry in the Municipality of Klina in the future.

10. Institutional framework

The Ministry of Agriculture, Forestry and Rural Development maintains a regional office in Peje, which is also responsible for Municipality of Klina.

- Currently there are five people working: Officer for livestock production, rural development and extension officer, two phyto-sanitary inspectors and one veterinary inspector.
- The office is equipped with all necessary equipment and as well they have a car.
- Main responsibilities are to support municipal offices, organize workshops and field days, collect data about the region and coordinate and support MAFRD in their field work.
- Usually all activities are coordinated with MAFRD and they are serving to farmer as an open field office where they can address their issues about agriculture and rural development.
- There is no specific programme in Kline Municipality, partly due to lack of budget but as well unclear role of regional office of MAFRD.

After the war in 1999 this system disappeared quickly and no cooperatives are active anymore in Kline. New farmer’s organizations and self-help initiatives are only very slowly evolving. They founded, if there are urgent needs, a strong interest or often, if there is the possibility to profit from a project.

Selected farmers groups, projects and NGOs:

- Agro Ujmiri: association of dairy producers around the MCC in Ujmir village

“Blegtori 2005” in Dollova: Mercy Corps has supported the creation this farmer association to start a new MCC, planned for September 2007.

- Intercooperation: Support to 1 ha strawberries in Grabanice region, 2 ha apples in Zabergje, 0, 5 ha apples in Dersnik, seedling production in Vide, compost production with Agro Kline.

- Articam/Italy: Support was given to MCC in Cerovik.


- Rural Advisory Service: Two RAS advisers contracted from May 2006 until end of 2006. No continuation since then.

- LDSP, Local development Strategy Project (EU financed) started in May 2007. The regional adviser is residing in Kline and supports Local Action Groups (LAG). These groups are invited to develop projects in a participatory way. However finance for the realization of these projects is not provided by LDSP.

Financing of agricultural investments are relying largely on private capital. In Kline no cases of major institutional financing through banks or the Agricultural Business Unit or major investment projects or proposals are known. Small credits from the local banks (Raiffeisen and ProCredit Bank) are possible, but only at relatively high interest rates. There are no advisors, who would be able to support farmers or investors in the elaboration of investment projects. Banks don’t have special credit lines for farmers.
II. List of planning rules and objectives

For specific land uses such as forestry there are planning criteria that are implemented at a much higher level of spatial detail, i.e. forest management plans, where the principle of sustainable yield should prevail. Sustainability here is understood as the notion that trees should not be harvested faster than they are replenished. For some forest land (i.e. KFA land) there are changing or emerging planning principles such as that of multiple use, that is land should be managed for a variety of simultaneous uses. Or example timber harvest, grazing, hunting and wildlife conservation. Acknowledging that in some cases the legal context of specific land uses has yet to be enshrined in a legal form, the following basic principles are followed.

1) The RLMP should guide sustainable economic development in the municipality;

2) The quality and quantity of prime agricultural land should be preserved.

3) RLMP should guide environmental protection.

4) The RLMP should ensure that land is managed in a manner that preserves and protects it from damage and degradation. Soil erosion should be minimized by restricting the cultivation of arable crops on steep land, using this instead for forestry or grazing purposes.

5) Planning takes into account the protective functions of the water sheds and the potentially negative downstream impact of effects of land use decisions such as deforestation of steep land. Any existing forested, scrub, or grassland in the upper part of river basins should remain under this cover. It is understood that this requires a regional rather than a municipal approach and remains pending the installation and functioning of river basin authorities.

6) Any mineral extraction activity should return top soils and land covers to their original condition, avoiding extractive methods that expose land surface to high levels of runoff and sedimentation. Given the recognition by the Spatial Plan of Kosovo of Kline Municipality as
the ‘garden’ of Kosovo, lignite mining initiated in the area of greatest soil fertility would be most detrimental to agricultural production. This is considered a most harmful development scenario, illustrated by the fact that the Obiliq lignite mining near Prishtina remains extensive and that the site is demonstrably accountable for heavy environmental impacts.

7) Construction of residential housing in rural areas should be planned and take place according to defined criteria, avoiding as much as possible loss of high grade agricultural land.

8) Land must be protected from the effects of soil erosion:

9) Intensive agricultural land use should be limited to flat areas or shallow sloping land.

10) Forest, shrub or permanent grass cover should be maintained on steeply sloping land, defined as land over 15%.

11) Arable agriculture should not be practiced on those areas that are frequently flooded, in order to reduce soil loss. These areas should be managed in manner that most effectively reduces risks. Land adjacent to major rivers / watercourses (floodplains) should be maintained under permanent grass / forest cover.

The assessment of landscape character is fundamental to the planning of rural areas. This is because rural areas, if not carefully managed, will experience significant impact as a result of future growth. It is therefore important to understand the sensitivity of these areas to change, so that growth that takes place outside the larger urban centers can be directed to locations which are least sensitive to change and contribute towards achieving a sustainable pattern of development.
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29. Direct views in the territory of the Municipality of Klina, 2008

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Legend
- Red: Private sector
- Green: Public sector

by Ferim Gashi