Horticultural strategy of Kosovo 2009 – 2013

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Abbreviations

ARDP	Agricultural and Rural Development Plan of MAFRD (2007-2013)
AKA	Alliance of Kosovo Agribusiness
AKIS	Agriculture Knowledge and Information System
CABI	Centre for Agricultural Bioscience International
CEFTA	Central European Free Trade Agreement
EAR	European Agency for Reconstruction
ECIKS	Economic Initiative for Kosovo
EU	European Union
EVV	Institute for Grapes and Wine (Rahovec)
Ha	Hectare (100 are or 10.000 s.m.)
HPK	Horticulture Promotion Kosovo (2007-) previously SPHPK
IP	Integrated Production
IPM	Integrated Pest Management
KCBS	Kosovo Cluster and Business Support Project (US financed)
KDC	Kosovo Development Centre
MAFRD	Ministry of Agriculture, Food and Rural Development
MFI	Micro Finance Institution
MIS	Market Information System
MSP	Marketing Support Project (EAR sponsored)
NGO	Non-Governmental Organisation
RAS	Rural Advisory Service
RDASD	Regional Development and Rural Advisory Service
s.m.	Square Metre
SOE	Socially Owned Enterprise
SPHPK	Swiss Project for Horticultural Promotion in Kosovo (2001-2006)
SWIK	Support to the Wine Industry in Kosovo (UNDP project)
t	Tonne (1.000 kg)
VAT	Value Added Tax

Summary

This horticultural strategy is an elaboration of the ARDP 2009-2013 of MAFRD. It has been made by four working groups of MAFRD and HPK staff, supported by external experts and an international advisor, who was also responsible for writing this paper.

THE SUB-SECTORS

Fruits
Kosovo imports many fruits, particularly apples and pears. At the same time fruit production is very profitable if modern technology is used. So there is good potential to increase apple production: until 2013 some 560 ha can be planted. This means that in later on (in 2018) 1.5 million kg of apples have to be exported, but considering the production cost of apples this is quite possible. The area under pears, sour cherry and soft fruits like blueberry, raspberry and strawberry can be increased as well. The latter are mostly required by (re-emerging) small and medium scale processors. Large scale processing is not a feasible option for the period under review.

Several measures are needed to support farmers with increasing their productivity and production capacity:

1. provide high quality seedlings at reasonable costs. A 1:1 matching grant scheme for well functioning nurseries can provide them with an incentive to produce high quality saplings, as well as make these available at reasonable costs to farmers. This will also stimulate a more strict inspection regime to enforce existing legislation.
2. draft proper legislation and undertake an eradication campaign for fire blight
3. provide financial support (of 30% of the cash investment) for newly established orchards and for cold stores.
4. provide advice and training on critical issues like orchards establishment, pruning/-thinning, fertilisation and IPM methods and approaches.

Vegetables
Since the war farmers have already invested much in greenhouse production; still there is room to expand the capacity, mostly by extending the harvesting period. An additional 170 ha of greenhouses is foreseen; most of these (100 ha) should be of mid-level technology. In this way a substantial part of the present imports can be substituted (but not all). Export is hardly foreseen as Kosovo does not have a comparative advantage in greenhouse production.

Several measures are needed to support farmers with increasing their productivity and production capacity:

1. provide financial support (30% of cash investment) for new, mid-level greenhouses
2. provide advice and training on: seedling production, cropping patterns, variety choice, micro-climate control, pruning/thinning, fertilisation and IPM methods and approaches
3. support construction companies to design mid-level greenhouses at reasonable costs
4. applied research on critical issues like greenhouse design and seedling production.

For open field vegetables the main issue is the intensification of production: more produce can be harvested from a smaller area. Local demand is expected to grow less than for other

horticultural products, while a substantial increase in export is foreseen as the cost price is relatively low - especially for peppers. The needed support measures are:

1. advice and training on intensive production technologies: variety choice, seedling production, land preparation, mulching methods, fertilisation and IPM
2. improvement in irrigation systems and creation of a land market.

Grapes

The situation with table grapes is similar to fruits. There is substantial room to increase the area (with 750 ha) in order to meet the growing demand and to substitute for imports and the production of vineyards that are abandoned (as they poorly maintained). New vineyards will only come into production after 2013. When they will be in full production in 2018, an annual export of 800 t is needed (to North Albania and Montenegro).

The needed support measures are:

1. provision of high quality seedlings at reasonable costs in the same manner as with fruits.
2. financial support (of 30% of cash investment) for new vineyards.
3. provision of advice and training on critical issues like orchard establishment, pruning/ thinning, fertilisation and IPM methods and approaches.

The area of wine grapes decreased by half in the 1990s; since 2002 another quarter of the area was abandoned. Despite excess processing capacities, the amount of wine produced dropped from 9 in 2005 to 6 million litres. Most is of (very) poor quality and large amounts are exported below cost price. The amount of quality wine is limited (0.5 million) and very few of it is exported. All in all, the present vineyards produce sufficient grapes for the local wine market, even if annually 4% is abandoned. Planting new vineyards can only be encouraged, once it is clear that Kosovo wineries can produce quality wines at competitive prices.

Ornamentals

The demand for both annual ornamentals is expected to grow (very) fast in the next five years. The profitability bedding plants is similar to greenhouse vegetables and considerably better if optimal technologies are used. The most limiting factor to increase production is the limited access to capital to invest in the necessary greenhouses and the lack of knowledge and skills. Also the marketing can still be improved substantially. The support needed is very similar to the support for greenhouse vegetable production:

1. provide financial support (30% of cash investment) for high quality greenhouses (which are more expensive than for normal vegetable production)
2. provide advice and training on: new species and cultivars (e.g. cut-flowers), seedling production, micro-climate control, fertilisation and IPM methods and approaches
3. improve the marketing via more specialised marketing channels, better PR and adding more value to the products (better grading, labelling, making bouquets).

Also the demand for perennials is expected to grow fast. The main limiting factor is the lack of knowledge and skills. As the profitability is (very) high and the necessary investments limited, the main support needed is advice and training.

CROSS CUTTING THEMES

Kosovo farmers need support from MAFRD, private service providers and donor projects. The first priority for MAFRD should be to provide farmers access to capital. This is best done by providing 30% investment subsidies on competitive technologies that are too expensive for resource poor farmers. This requires setting up a payment agency.

In the next five years 37 million Euro has to be invested; so 30% investment subsidy would amount to 11 million, or 2.2 million per year. These investments will generate annually 12 million Euro extra income and nearly half a million labour days. If one assumes that one person works 200 days/year, this equals nearly 2.500 fulltime or 5.000 part time jobs.

Apple production generates the best returns; for every 1000 Euro invested, farmers earn 600 Euro extra per year and 25 days of work are created. Table grapes are efficient in generating income; yet they do not generate much work. Greenhouse production (both vegetables and ornamentals) have good potential to create jobs, but financial returns for vegetables are low.

The second priority is to provide access to knowledge and skills. This means setting up an extension system. Until now Kosovo does not have a full fledged extension service. In line with MAFRD policies, the best system would be to tender all extension assignments to NGOs and private companies. A national extension council (of AKA, farmers' representatives, donors, etc.) should decide on priorities and supervise the tender procedures.

Private stakeholders have to take the lead in improving access to inputs and technologies; commercial companies should increase their cooperation with international companies and select those inputs and technologies that are appropriate for Kosovo. Donor projects should (continue to) focus on testing and adapting innovations, in cooperation with private actors and researchers.

The access to markets can be improved by private actors and MAFRD. The first need to work on producing (better) packaging materials. The latter needs to define, promote and enforce quality standards. Accurate market information is needed as well; short term market information cannot be organised on a commercial scale. Long term market analyses have to be made to assist farmers in making good investment decisions, as well as to assist the policy department of MAFRD in designing evidence-based policies. The latter is the last priority for MAFRD. The present strategy is mostly based on guestimates, but future strategies needs to be based on detailed market data and on accurate farm management data. An independent institute is needed to collect and analyse these data.

1 Introduction

1.1 Context

The present strategy builds on previous strategies of the Ministry of Agricultural, Forestry and Rural Development (MAFRD). The first strategic document was the Green Book, published in 2003 where the ministry‘s strategy for sustainable agricultural and rural development is summarised as “to facilitate structural changes in the rural economy and establish the economic framework and mechanisms to support employment creation and income generation through improvement of agriculture and rural development.”

In the Green Book this is translated into five concrete objectives:

1. increase the overall income of farmers;
2. encourage import substitution and develop exports of niche agri-food products;
3. ensure food security and quality for consumers;
4. increase the value of production through improvements in harvest and post-harvest technologies and product processing; and
5. increase the economic security of rural inhabitants.

The second main policy document of MAFRD is the Agriculture and Rural Development Plan 2007-2013 (ARDP) published in 2006. It is based on two pillars:

1. undertake actions that will overcome the bottlenecks that are holding back sustainable rural development
2. start to align Kosovo’s rural sector with the axes of EU rural development policy:
   - Axis 1 - Competitiveness
   - Axis 2 - Environment and improved land use
   - Axis 3 - Rural diversification and quality of rural life
   - Axis 4 - Community-based local development strategies

The more concrete objectives identified in ARDP 2007-2013 are:

1. additional income for farmers and rural dwellers, leading to improved living standards and working conditions in rural areas;
2. improved competitiveness and efficiency of primary agricultural production, in order to achieve import substitution and take advantage of export markets;
3. improved processing and marketing of agricultural and forestry products, through increased efficiency and competitiveness;
4. improved on-farm/in-factory quality and hygiene standards;
5. sustainable rural development and improved quality of life through promotion of farming and other economic activities that are in harmony with the environment;
6. creation of employment in rural areas, particularly through rural diversification;
7. alignment of Kosovo’s agriculture with that of the EU.

This strategy for the horticultural sector focuses on the first two objectives of the ARDP: increase the income and competitiveness of the horticultural sector. The aim of the strategy is to guide and coordinate the investments of all stakeholders (private, public and donors), in the sector in the coming years (2009-2013).

The relatively short time horizon of the strategy (2009-2013) forces all stakeholders to look at the issues that can reasonably addressed in the coming years. It is also allows for a more exact assessment of the resources needed to achieve the formulated targets.

This strategy has been developed by a four working groups (one for each sub-sector) with staff from MAFRD and HPK and some independent experts. An international advisor facilitated the analytical process and was responsible for the writing. Most data used here are 'guestimates', elaborated by the Working Groups. The poor quality of many data means that the strategy has to be reviewed and updated in 2010.

1.2 The analytical framework

The analytical framework used is reflected in the set-up of the paper. Part I explores the context of the horticultural sector. First of all the transition from a specialised agriculture dominated by SOEs with export capacity (in and outside ex-Yugoslavia) to a diversified agriculture dominated by small farmers working for the local market. A second dimension is the state support to the sector; this support is still weak (chapter 2).

In part II four sub-sectors are analysed and partial strategies designed: fruits (ch. 3), vegetables (ch. 4), grapes (ch. 5) and ornamentals (ch. 6). This is done in three steps. First a value chain analyses is made of the most important crops (*marker crops*). The production systems, post-harvest issues, processing, marketing and import and export are described and options for improvements identified.

Next the potential increase in market demand in 2013 is guestimated, based on:

a. the expected growth of consumption, based on population growth (assumed to be 2% p.a.) and the development of the consumption per capita
b. the expected reduction of production by subsistance farmers
c. the potential to reduce imports
d. the potential to increase exports.

The potential additional area per crop or sub-sector is calculated by dividing the expected increase in demand by the expected yields per ha in 2013.

The third step is to describe the support farmers need to grab the opportunities offered by expanding markets in 2013. It is assumed that family farms will remain the backbone of the horticultural sector; to become more competitive these farms need (better) access to inputs and technologies, to markets, to capital (credit) and to skills and knowledge. In some cases good policies and regulations are essential as well.

Part III presents cross-cutting issues. What are common elements in the support farmers need and how can this be organised? How to assure access to inputs/technologies, markets, capital and knowledge? What is the role of MAFRD, the private sector, NGOs and donor-funded projects? And how can MAFRD design evidence-based policies and strategies in the future?

The final part is the design of the overall strategy which is presented in the summary.

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Part I: Context

2 The context

2.1 The agriculture sector in transition

Agriculture has been always been a key sector in the economy of Kosovo. After World War II, substantial investments were made, productivity increased and the number of people working in the sector decreased. In the 1990s this trend was reversed: investments plummeted, productivity dropped and the share of the working population in agriculture doubled from one quarter to well over half in the last part of the decade.

After the war economic growth in Kosovo has been poor and the performance of the agricultural sector was below average. Both the area under cultivation and the yield per ha dropped. So the share of agricultural in the overall economy dropped quickly; currently it is some 15%, with still 40% of the people officially employed in the sector. Productivity is very low and two-third of the poor live in rural areas. In 2006, 49% of the rural households were poor[1]; 18% even extremely poor (in urban areas this was resp. 37% and 14%).

One reason for the poor performance is the small average farm size. In 2000 around 55% of the agricultural households were in the range 0.5–3 ha. Only 1% had more than 10 hectares. The many small and resource poor farmers produce low yields due to the lack of proper inputs and technologies and to a lack of skills and experience to use these. Secondly, part of the agricultural infrastructure was destroyed during the war. Thirdly the break up of Yugoslavia caused major disruptions in agricultural markets. While for some products there is no longer a large home market (low quality wine), other products, that previously came from other parts of Yugoslavia (eg vegetables) are now being produced locally.

Fourthly, the privatisation of several SOEs led to a loss of production and processing capacity: often their equipment proved obsolete and/or the supply of raw materials became a problem. The latter is caused by the fact that factories have to deal with many small farmers whose production costs are too high to allow the processing industry to be competitive.

One way to get out of the vicious circle of poverty and low productivity is credit to invest in more productive inputs and technologies. However only 2-3% of the loan portfolios of banks and MFIs is used for agricultural purposes. The lack of collateral is one reason for that; another is the lack of capacities of the financial institutions to assess the viability and risks (especially long term) of agricultural investments and the skills of farmers. Farmers are reluctant to take loans against the going interest rates of 13 % or more. The legal system is an obstacle as well, as it has not protected banks if loans were defaulted.

[1] The poverty line is defined as 43 EURO/cap./month. This translates in 3.600 EURO/family/year

2.2 Support for the agricultural sector

Until today the most direct support to the agricultural sector has been two-fold: import/export policies that influence the competitiveness of the sector and the state budget for agriculture.

Like most Balkan countries, Kosovo has a very open economy. Agricultural products from CEFTA (Central European Free Trade Agreement) countries have a zero-custom tariff. For all other countries it is 15%. The VAT of 15% applies to imports of all countries. As for the import of inputs, in 2004 customs tariff and VAT on most categories have been abolished. This refers to seeds/planting materials, fertilizers, agricultural machinery, most pesticides (VAT still applies only for insecticides). At the moment MAFRD is working on getting some other inputs (e.g. pumps for irrigation and plastic film for greenhouses) under the same regulation. No taxes or levies are paid on exports.

For many farmers the zero-tariff for imports from CEFTA countries is a sign that the state does not protect their interests. Indeed imports dominate on several agricultural markets. However, one has to widen the picture. Kosovo farmers pay virtually no tax. Seventy percent of government revenues is collected at borders and most of the remainder comes from VAT. So exemption of custom duties and VAT is a major favor to the sector.

Another concern is the budget for agriculture. Both in absolute and percentage terms the agricultural budget is very low, as the next table shows.

Table 1 Kosovo agriculture 2006 budget compared with neighbouring countries

	Unit	Kosovo	Albania	Serbia	Macedonia	Montenegro
Population	Million	2.0	3.2	7.4	2.0	0.6
GNI/capita	€	1,500	3,290	4,730	3,460	5,180
Agriculture share in GDP	%	15%	23%	17%	10%	
Agriculture employment.	%	40%	58%	30%		
Budget for agriculture*	€ mill	6.4	50	207	25	12.6
Agric budget/capita	€	2.5	16	28	12	21
Agric. budget % of GDP	%	0.21	0.47	0.59	0.36	0.41

Source: World Bank and FAO statistics and estimates of the authors for Kosovo based on the ARDP

The state budget for agriculture is (less than) half of that in neighboring countries. And these countries have again very low agricultural budgets compared with other transition countries (which again have a low budget compared to more developed countries). The poorest country in Europe, Moldova, spends 0.9% of GDP on agriculture; for Armenia this is 1.2 % and for Kyrgyzstan 1.8%. So the agricultural budget of Kosovo is extremely low; both in absolute terms and as a share of the GDP.

In 2008 the budget was 8 million and the proposed budget for 2008 is 12 million Euro. This will bring Kosovo more in line with neighboring countries; although these are also quickly increasing their agriculture budget (with a view on expected EU subsidies in the future). In 2008 a small part of the Kosovo Consolidated Budget has been allocated for direct financial support to farmers. This is expected to grow in the future. It is foreseen to set up a payment agency for this, in line with EU-regulations.

The next table shows that even with low salaries, a high percentage of the agricultural budget is spent on salaries and administrative costs. This is partly logical as even with a low budget one needs a core staff and one cannot avoid some core overhead costs.

Table2: Allocation of agricultural budget in comparison to the region

	Agricultural budget (M Euro)	Ministry staff	Average monthly salary	Share of salaries in ag. budget	Admin. Cost/ staff	Share of admin. costs in ag. budget
Kosovo	6.4	609	223	25 %	4,872	46 %
Montenegro	12.6	123	450	5 %	7,021	7 %
Serbia	207	964	640	4 %	35,342	16 %
Macedonia	25	430	514	11%	7,468	13 %
Albania	50	1,350	467	15 %	12,499	34 %

Source: WB data in: WB, 2008. Albania, Strategic policies for a more competitive agricultural sector

All in all, the government has not yet been able to provide meaningful support to the private actors in agriculture. This is understandable, as the (interim) government faced many other essential priorities in terms of policies and budgets - still it needs to change. In the medium term substantially higher budgets will be needed if Kosovo wants to create a competitive agriculture.

Although part of this will have to be used for higher salaries and to increase the number of staff working on the EU-accession process, this strategy is based on the assumption that additional budgets will also come forward for:

- increased direct payments to farmers and agro-entrepreneurs
- improved inspection systems
- setting up a functional Agricultural Knowledge and Information System.

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Part II: the sub-sectors

3 Fruit production

3.1 Production system

3.1.1 Introduction

Kosovo has been a tree fruit growing area for centuries – benefiting from favourable agro-climatic conditions as well as from traditional varieties with good pest and disease resistance. The basis of a modern commercial industry was established in 1957 with the introduction of new varieties and cultivation techniques and, by 1984, over 12,000 ha of were in production – of which 84% were privately owned. Apples were dominant, followed by plums, pears, cherries and walnuts.

Peja Institute was responsible for producing planting materials. Most rootstocks were generative, while the vegetative rootstocks used tended to be the most vigorous ones, allowing only up to 500 trees per ha. Marketing channels were centralised with fresh and processed fruit being sold throughout Yugoslavia.

By 2001, as a result of system collapse before and during the war, commercial orchards had been reduced to less than 60 ha and all processing factories had been either destroyed or closed. Peja institute had effectively stopped working and no vegetative rootstock was produced for any top fruit species. The market was dominated by imports of fruit and of poor quality planting material from neighbouring countries.

Since 2001 the sub-sector is recovering. With support of projects, nurserymen started to produce modern, vegetative rootstocks and farmers started to plant intensive orchards, mostly apples. Especially HPK assisted many farmers to plant new, intensive orchards, by availing high quality seedlings for free. In 2007 this was interrupted due to the outbreak of fire blight and an apparent lack of skills of farmers to manage more intensive orchards.

As for the species composition the next table shows the area under perennial crops in 2005 grown in orchards larger than 0.1 ha. Apples and plums are the dominant crops, together they cover two thirds of the total area.

Table: The area of the main fruits and nuts in 2005

Fruit species	Ha	% of total
Apple	608	38
Fresh plums	470	30
Sour cherry	194	12
Pears	141	9
Hazelnuts	89	6
Chestnuts	23	1
Others	60	4
Total	**1,585**	**100**

Source: MAFRD Statistical office. Based on data from municipalities

Throughout this paper, apples are used as a marker crop; it represents nearly half of the total fruit production and offers the best opportunity to work on import substitution. It is assumed that the patterns and principles that apply here are the same for other top fruits.

3.1.2 Climate

Kosovo has the right temperature, right soil, sufficient rainfall and sunshine for orchards with temperate fruits and nuts. However, the growing season is slightly shorter than its southern competitors, such as Macedonia and Albania.

The main fruit growing regions are found in the Dukagjini plains, where the av. temperature is 1.2 C higher than on the plain of Kosovo and which has 25 more days of vegetation. Late spring frost presents a risk, especially sensitive are the phenol-phases of fruit-crop blooming. Extremes occur once in 25-30 years in the period 20 April-20 May. In Dukagjini Plain the first autumn frost, on average, occurs from 22 October (Gjakova) to 11 November (Prizren) whilst on the Plain of Kosova this is 12-27 October.

Total annual rainfall of 750-850 mm is good, but the distribution is not favourable. During the vegetation period (April-Sept.) with high temperatures, rainfall is insufficient (340-350 mm). This means additional irrigation is needed. Relative air moisture is suitable. The highest values are recorded in winter whilst it is lowest in summer (July-August). Average annual values of relative air moisture in Dukagjni Plain are 70%, whilst in Prishtina and Ferizaj it is slightly higher (72-76%).

3.1.3 Production systems

Backyard trees
Half of the production comes from the backyards of 186.000 families with an estimated 7 trees on average. All together this equals (over) 6.000 ha with a total fruit production of 18.000 t. All is used for home-consumption. Generally trees are poorly maintained, if at all, and productivity is very low (3 t/ha). They do however represent an important risk, as a source of diseases and pests, for more commercial oriented farmers.

Extensive orchards
Generally these small orchards (0.1 – 0.4 ha) are poorly managed. Very little pruning, no thinning, poor plant protection and a lack of management of intercropped grasses lead to irregular and low yields of low quality. Most is used for home-consumption.

In many cases the trees are over 20 years old and have been grafted on generative root stocks, leading to leafy and high crowns. Trees are up to 6m high and often are a mixture of species and types. Plant density is up to 500 trees/ha. These fruits present a potential source of diseases and pests. Yields estimates differ; the ARDP estimated it to be 5 t/ha; a UNDP survey found 6.6 t/ha for a sample of farmers. The Working Group estimated yields are increasing and put it at 7.7 t/ha.

People still plant new orchards with generative seedlings. In 2006 and 2007 this is estimated to be 30 ha and for 2008 and 2009 it will be double: 60 ha. They are assessed to have a maximum yield of 15 t/ha. Such orchards risk to be abandoned in the future, when labour costs will become too high to harvest large, bushy trees.

Semi-intensive orchards
In comparison with extensive orchards these are bigger (0.4–1.0 ha) and distinguished by:

- Planting in lines, with 500 - 1000 trees per ha;
- Cultivation between lines, mainly natural grass which is mowed or used as pasture for livestock. Alfalfa is also cultivated
- Some protection and sporadic fertilisation (mainly in spring)
- Slightly better packing in used carton or plastic or wooden boxes
- Some storage in simple store rooms/ basements etc.
- Most products sold on the nearest local markets by farmers on market days
- Some farmers produce home brandy (rakia) from fallen fruits
- Knowledge on pests and diseases and issues such as pollination is very limited.

The WG estimated the yield of mature semi-intensive orchards at 30 t/ha.

Intensive orchards
These commercially oriented orchards differ from semi-intensive ones:

- They focus on one variety and this variety is based on market demands: fruit taste, aroma and shape, ripening period (earliness)
- Vegetative rootstocks are used (MM106, M26, M9)
- Higher plant densities: 4 X 2.5 m to 3.5 X 1.5 m (1.000 – 1.900 trees/ha)
- Cultivars with better pollination features are used
- Farmers try to shape the crown (into improved pyramid, craggy bush or spear system) by pruning, but know-how on this is still limited
- Green pruning and fruit thinning is not optimal and so is the fruit quality. Fruits remain small and only partly coloured (as they remain partly in the shadow)
- Irrigation is improving: furrow, flooding and drip irrigation systems are used. To assure proper fruit setting, in summer irrigation intervals should be 7-10 days (in winter 3-4 weeks suffices). MAFRD estimated that in 2004, 55% of the 435 ha of private commercial orchards was irrigated. These days this is higher.
- Inter-rows remain cultivated; mostly with grass that is frequently removed. Some herbicides are used. Mulching is not practised (except in demonstrations)
- Picking is done successfully, but more based on intuition than on a scientifically evaluated biological parameter (ripening);
- The orchards have access to permanent roads.
- Packing is done in plastic, wooden or carton boxes which were previously used for other crops. The disinfection of these boxes before filling is not practised.

The WG estimates the yield of mature, intensive orchards at 45 t/ha.

Donors are promoting (semi-) intensive orchards which require vegetative saplings. In 2006 HPK assisted farmers with such saplings for 60 ha of semi-intensive orchards. It proved difficult for them to manage these properly (in terms of fertilisation, pruning, thinning, etc). On top of that in early 2007 an outbreak of fire blight put all investment in jeopardy. Therefore, the enthusiasm was reduced and in 2007 and 2008 resp. 50 and 70 ha were planted throughout Kosovo with (semi-) intensive orchards, without much support of projects.

3.1.4 Geographical spreading

As for the geographical distribution, the next table gives on overview of the situation in 2005 for the main species, apples and plums [2].

[2] SOK, 2005. Based on data provided by municipal agricultural departments

Table: Distribution of fruit production by municipalities

Commune	Apple	Plums	% of total
Klina	140	157	28
Decani	117	109	21
Peja	53	18	7
Istog	50	10	6
Ferizaji	47	7	5
Gjakova	29	20	5
Prizreni	30	15	4
Kamenica	22	7	3
Gjilani	14	23	3
Malisheva	13	18	3
Suhareka	13	4	2
Rest	80	84	15
Total area	**608**	**470**	**100**

So the western region (Dukagjini plains - highlighted) is the core area of fruit production with an extimated 76% of the total.

3.1.5 Varieties

A range of apple varieties is grown. They can be grouped according to ripening stage and to colour and taste. Some are for processing. The most used cultivars are:

- *Standard cultivars*: Ida red, Golden Delicious, Red Delicious, Granny Smith, Jonagold, Prima, Melrose, Elstar etc.;
- *Newly introduced cultivars*: Spartan, Saturn, Amorosa, Winston, Gotha, Braeburn, Gala, Fuxhi, etc.
- *Cultivated cultivars*: Red Falstaff, Jonica, Jonagored, Red Prince, Hasen
- *Early cultivars:* (increasingly demanded): Sunrise, Katy, Scrumptious, Red Devil.

A survey in 2006 by the MSP project among 60 commercial farmers found the following varieties: Ida Red 67%, Melrose 7%, Golden Delicious 6%, Jonagold 6%, Red Delicious 4%, Boskop 3%, Granny Smith 1% and Jonathan 1%. So Ida Red covers 2/3 of the production. This seems typical for the national level as well.

According to an informal survey by HPK among wholesalers, the most popular apple varieties (in order of preference) are: Ida red, Golden Delicious & Red delicious, Jonagold, Mutsu and Granny Smith. This fits well with the present local production structure, yet if the taste of Kosovo consumers will converge with the taste in EU-countries, where Ida red is hardly eaten, the cultivar structure might need to be adjusted.

3.1.6 Nursery system

After the war the nursery system had to be rebuilt urgently as the generally used generative rootstocks have some severe disadvantages:

- rather long delays between initial investments and the first harvest
- large, bushy crowns that are hard to shape by pruning, which again causes insufficient aeration, and insufficient sunshine on ripening fruits etc.
- high labour costs for (pruning and) harvesting
- lower yields per ha.

HPK introduced vegetative rootstock in four nurseries in 2002. This innovation did not spread automatically, so in 2006 another three were supported. The next table shows the number of vegetative rootstock in six nurseries supported by HPK in 2008.

Table : The number of apple saplings on vegetative rootstocks in 2008[3]

Rootstock	3 nurseries started in 2006	4 nurseries started in 2001	TOTAL
MM111	0	7.310	7.310
MM 106	18.400	16.224	34.624
M 26	32.000	16.192	48.192
M 9	36.000	15.888	51.888
M27	0	1.863	1.863
Expected production	***86.400***	***57.477***	***143.877***

In 2006 MM111 is no longer used, while M27, M 9 and M 26 are on the increase. This is an indication that higher planting densities are aimed at.

As saplings stay 2 years in a nursery, half come to the market in any one year. So 72.000 saplings are available. A survey of the WG suggests one third is sold to backyard farmers. The remaining 48.000 suffice for 32-48 ha with a density of 1.000-1.500 trees/ha.

There are many other nurseries which still rely on generative rootstocks. MAFRD data show they produce 98.000 generative seedlings. If two-thirds of these are apples and if they stay 2 years in the nursery while 40% goes to backyards[4], the remaining suffices to plant 60 ha with 325 trees/ha. Seedlings are imported as well, but how many of these are fruit or apple seedlings is unknown. The WG estimated that 60.000 vegetative apple seedlings are imported[5]. With one third going to backyards, this is sufficient for 32 ha with 12.500 trees/ha.

So in 2008 in total 60 ha of extensive orchards with generative trees are planted and 70 ha of vegetative, semi-intensive orchards. At the same time 57.000 seedlings are used to replace the 1.3 million fruit trees in backyards; a replacement rate of 4%.

Imported saplings tend to be of low quality. Regulation has being drafted to introduce international standards, based on the advanced-CAC system. Yet, the standards are insufficiently enforced. Inspection and certification is only partly applied. Nurseries that are registered try to follow the rules, but when doing so they are not protected on the market. Uncontrolled competitors continue to offer poor quality seedlings on the same market. This undermines the willingness and motivation of nurserymen to join certification schemes and pay the (symbolic) fee of 25 Euro.

So despite some progress there are still important limitations to the nursery system; particularly the quality (incl. the var. purity) of saplings leaves much to be desired:

- There are only 3 mother nurseries for scions, which cannot fulfil all needs. As nurserymen get scions 'anywhere' the risks of spreading diseases via saplings is considerable. This also applies to most imported scions. Only 3 nurseries have imported scion material certified by reliable sources (using EPPO standards).
- Only 4 nurseries have mother orchards for vegetative rootstocks for apples that is free of viruses and with a guaranteed purity of variety

[3] Informal survey (2008) by the Working Group
[4] With 6.000 ha of backyards, 46.000 seedlings are needed to replace these orchards every 30 years.
[5] Import data show 300.000 imported seedlings, but this includes ornamental- and grape seedlings.

- None of the nurseries has an orchard for the production of seeds for rootstocks; seeds are collected by fruits grown freely without phyto-sanitarian guarantee.
- There are only three orchards with a collection of cultivars.
- Nurseries are not organised in groups or functional associations. Few nurseries hire experts. As a result, agro-technical, pomo-technical and phyto-sanitary measures are incomplete. Also knowledge on diseases and pests is incomplete. In many cases diseases and pests have been identified in nurseries.
- In 2004 MAFRD started a certification scheme[6], but most nurserymen have insufficient knowledge on this and on the standards required. The coding system for rootstock and cultivars is not known and not applied.
- The rights of patent owners of cultivars are not known or not respected
- When infected orchards are close to nurseries no institutional mechanisms exists to solve this problem.

Data from existing nurseries show that these can be profitable; their main constraints are lack of skills, limited access to high quality genetic material and unfair competition. The latter is enhanced by the fact that many customers are insufficiently aware of the critical value of better quality saplings.

According to MAFRD data, 17 producers of fruit sapling material are registered.

3.1.7 Plant protection

Since April 2007 a serious outbreak of fire blight was identified, it is clear that this is the biggest threat to the top-fruit industry in Kosovo. Being very contagious and without any treatment available, the only way to combat it, is eradication. To enable farmers to eradicate it, most countries enacted legislation that both forces people to eradicate diseased plants as well as provides some form of compensation for this.

An Albanian expert assessed the situation in 2007 and concluded that a dramatic situation could develop. Young trees, in new orchards, will die before producing fruits due to infestation from nearby old orchards. Losses can be high. He recommended:

The farmers

- Remove cancers, dead/burned shoots, twigs, flower clusters, shrived leaves and dead tissue. Prune in dormant season (winter). When a trunk is infected extirpation of the whole tree may be needed. Burn pruned material outside orchard
- Attention must be paid to wild hosts and other secluded tree hosts near orchards
- Saplings must be analyzed before putting in the market
- Choose resistant fruit varieties and rootstocks
- Inspection of the trees during the blooming time and after
- Avoid flowers in nurseries. Bees should not be allowed in infected orchards
- Spray immediately after hard rains, late frosts, hail, strong storms, etc that causes wounds in the plant tissues
- Nurseries that have a fire blight history within or around them should be closed
- Creation awareness through trainings and leaflets

[6] Administrative instruction No. 12/2004. On the registration of producers of seedling material

The government

- Establish adequate legislation and implement it immediately
- Establishing CAC-1 requirements in the production of planting materials of fruit trees
- Strict inspection of border entry points of propagation/planting materials including seedlings. Infected materials must be prohibited to enter Kosovo
- Establishment a forecasting system for fire blight disease in Kosovo.

In 2008 some action was taken by MAFRD, supported by HPK. Farmers were trained and information was disseminated. However, discussions on a necessary eradication program did not yet result in legislation and the planned Fire Blight Committee to monitor the spread of the disease has not yet been installed. Plum Pox virus could cause a similar major upheaval, but at present no information is available on its distribution.

The outbreak of fire blight and the continuous threat it poses to all apple growers was one reason for HPK to stop promoting apple production. Indeed, as long as no adequate mechanisms are in place to eradicate this disease, apple production remains a risky affair.

Other problems are:

- Plant protection is improving, but remains conventional. There is no knowledge on alternative protection methods, and environmental issues are insufficiently taken into consideration.
- Farmers are aware of main diseases (know as hiri, kroma, rotting and lately fire blight). Yet, they are not familiar with all protection techniques and methods;
- Farmers in Dukagjini have problems with the apple worm
- Machinery is getting more advanced. Spraying atomisers are used, or motor pumps, tractors and cultivators for cultivation between lines;
- Advisory systems are not functional whilst producers in some areas are organised into associations facilitating in this way the advisory system;
- Warning and prognosis systems for diseases do not exist.

MAFRD cooperates closely with HPK and CABI-Switzerland on IP-issues. A Technical Working Group “Apple IPM in Kosovo” was created with representatives from MAFRD, service providers, apple growers, university faculty (plant protection), Peja Institute, inspectors from municipalities and regional consultants. The main issues were monitoring of apple pests and the Green & Yellow List of measures and pesticides that can be applied in IP. In 2009 guidelines will be made with general agronomic rules and minimum requirements (defined as mandatory rules/prohibitions or “must” items), that have to be met by all farmers participating in the apple IPM/IP programme. It will be based on the structure of the General Technical Guideline for IP published by MAFRD in 2006.

Some more general support of CABI is foreseen as well in the area of pesticide registration and training of MAFRD staff and service providers in rational pesticide use.

3.1.8 Yields

Little is known about yields. The next table shows yields of apples and plums in relation to farm size, as estimated by the WG of the ARDP.

Table: Productivity of apples and plums, based on farm seize in 2004[7]

	Extensive	Semi-commercial	Commercial	Total/ av.
Apple				
Orchard size	0,10 – 0,40 ha	0,40 – 1,00 ha	> 1,00 ha	
Average area	328	187	93	**608**
Production t/ha	5	20	35	**14.2**
Total t	1.640	3.740	3.255	**8.635**
Plums				
Orchard size	0.5 - 0.10 ha	0.10 – 0.25 ha	>0.25 ha	
Average area	334	89	47	**470**
Production t/ha	6	12	20	**8.3**
Total t	2.004	1.068	840	**3.912**

Source: ARDP; based on MAFRD Statistical Office. Based on data from municipalities

The WG for the present strategy assessed the yield at two levels: the maximum yield of a mature orchards and an average yield, based on the expected yields in the first 15 years of an orchard. This leads to the following assessment of yields in the three different orchard system described in par. 3.1.3:

- extensive orchards: max. yield: 10 t/ha; average: 7.7 t/ha.
- semi-intensive orchards: max. yield 30 t/ha; average: 25.7 t/ha
- intensive orchards: max. yield 45 t/ha; average 38 t/ha.

In the last few years semi-intensive apple orchards have been established and the yield quoted above is based on the initial yields obtained there. The estimated 45 t/ha of intensive orchards (ca. 2,000 tree/ha) is based on international experiences.

3.1.9 Post harvest issue

Picking is done successively but often not according to biological stages of ripeness as farmers are not sufficiently familiar with them and as they do not have the labour to harvest in consecutive stages.

Packing is mostly done in wooden crates (10-20 kg). Corrugated carton boxes are also used. The 2006 survey of MSP found that 67% of the commercial farmers sold apples in cardboard boxes (12% with name/logo; 55% without) or wooden boxes (27%); 5% were packed in plastic bags. Small farmers use plastic bags, some wooden boxes.

Storing is not yet generally done. Most storage capacity of former SOEs is obsolete. Some farmers store apples in low costs stores for a few months (up till new year). Most of the time these are basements or simple farm structures; with or without some form of insulation. In a few places improved local storage is used: apples are kept on pallets, well above the floor, ventilation is stimulated by sufficient outlets and the floor is wetted regularly to maintain humidity. In the village of Istog 800 t is stored in this way.

Four farmers' groups, with support of donors (KCBS, HPK), invested in cold stores with a total capacity of 565 t where apples can be stores up to 5-6 months. The investment per tonne of storage capacity is 400-500 Euro. Operational costs depend on the scale of operations, but with limited quantities they are some 10 cts/kg for 6 months.

Whether storage is economically viable depends on how the prices develop after the harvesting period. Data on 2005-2008 show that the prices starts to increase substantially

[7] MAFRD Statistical Office. Based on data from municipalities

in April-May. Cold rooms with atmospheric control (or ULO) are needed to fully benefit from this high prices.

One limitation farmers face in storage is their need to sell as early as possible as they need the cash urgently. The main constraint is however the high initial investments. Options to make these investments economically more attractive are:

- reduce costs to a minimum by using existing facilities and by making use of economics of scale
- improve the overall efficiency of the cold stores by storing other products in summer; e.g. milk, meat or ice-cream.

Generally it is difficult to make a cold store profitable when it is only used for one product for one part of the year.

3.1.10 Processing

In the 1960s AgroKosova was founded; an umbrella organization for two major fruit processors, Progresi (Prizren) and Ereniku (Gjakova). These SOEs processed 30,000 t of fruit/vegetables and supplied a wider market, including export to Europe. Progresi focused on jams and marmalades, while Ereniku worked on fruit juices (apple, pear, cherry, blueberries) with a maximum capacity of 50,000 tones/year. Progresi is now operating at low capacity, using 500 tonnes of raw materials which they source from 800 farmers. The capacity of its cold chambers is 5.000 t. It exports limited amounts to Kosovars in the Diaspora. Ereniku is closed.

Actually in Kosovo, there is no instance of utilizing fruit quantities in the fruit juice industry. A number of operating units import concentrate essences in order to produce fruit juices. Processing fruit juices from local fruits requires a constant supply and using economies of scale in production. It will take many more years before this can be achieved in Kosovo.

There are a few mid-level processors who are more specialised; e.g. Agroprodukt Commerce in Podujeva with a capacity of 1,000 t/year (refrigeration capacity 300 t.). It is mainly involved in (partial) processing of mushrooms (with a HACCP certified line), and also deals with wild blueberries, juniper berries, rosehip and other wild fruits and very recently are involved with cultivated raspberries. They export 100% of their products, often half-fabricates of cleaned and partially processed products.

Kooperativa Rugova in Peja is a mid-scale processor focused on wild blueberries and other wild fruits and mushrooms. They supply the domestic market, and export some quantities to the neighbouring countries (Montenegro and Serbia).

Processors face many constraints. The basic one is that modern processing factories are capital intensive so huge quantities are needed to capture economics of scale and generate reasonable returns to investments. This is difficult for a number of reasons:

- the cost price of raw materials coming from small farmers is too high. International competition on processed fruits is very fierce[8]. The production of raw materials needs to be large scale and either mechanised or based on very low labour costs.

[8] One report concludes that even when Kosovo processors would get apples for free, they can not compete: KCBS 2005. Processing Equipment for Fruit and Vegetables.

- transaction costs between the many, small farmers and the factory are very high. There are very few farmers' organisations that could increase the efficiency of the interaction. Contract growers are very few as well.
- normally processors use second or third quality produce, but in Kosovo farmers do not grade their fruits
- a small internal market makes it difficult to obtain economics of scale. In addition Kosovo companies lack access to Serbia, while Serbian products can enter in Kosovo freely
- the political status of Kosovo forces Kosovo processors to use international transport companies for exports, which increases the costs of transport.
- as many fruits are still imported, farmers can get better prices for their fruits on the fresh market (even with rather low quality). For the same reason farmers do not plant varieties geared towards processing
- transport costs are high and quality is suffering (e.g. with wild blueberries).
- lack of energy causes an increase in costs (with a few exceptions). Significant levels of refrigeration are needed to slow down spoilage and maintain freshness/flavour of ripe fruit. Water supply is also problematic.

Some problems stem from the processors themselves:

- a lack of equipment; e.g. individual quick freezers.
- very few agro industry engineers and food technicians and a general lack of know how has been raised at some processing units.
- serious issues with privatization of buildings, a.o. with Progresi. The pending status of privatization makes investment plans complicated, as well as relations with banks
- a lack of quality standards and food safety standards for processed products dedicated for export. few processors have implemented HACCP or ISO standards. They are the most important exporters of processed or semi-processed products.
- Packaging and labelling could be improved. Packaging materials are imported leading to dependency and higher transport cost.

As a result of the constraints, only 1.5% of the SMEs in Kosovo are agro-businesses and only 20% of fruit-based preserves currently sold in supermarkets are produced locally.

Small scale fruit processing is significant in rural areas, where farm families produce different jams, compotes or dried fruit for their own needs. A few farmers own higher volume equipment for processing different soft fruits into jams etc, and these products are sold by farmers on regional markets. HPK helped a number of growers to increase their returns to soft fruits (raspberries and blackberries) by adding jam as a component.

The main conclusion is that large scale capital intensive factories have too many difficulties in organizing local raw material supply to be profitable. Mid-scale processing is apparently the most viable economic size. Small scale fruit processing will continue in the future in providing a part of the internal market demand.

3.1.11 Marketing

Market size

The ARDP estimated[9] total annual fruit consumption in 2001 at 22 kg/cap. In the next table data from neighbouring countries are given for comparison.

[9] Based on a survey implemented in 2001

Table : Fruit consumption (kg/cap/yr) in the region in 2003

Country	Fruit	Apples
Albania	90	13
Bosnia and Herzegovina	57	12
Bulgaria	45	5
Croatia	88	18
Hungary	71	22
Romania	64	29
Serbia / Montenegro	118	22
FYR of Macedonia	79	10
AVERAGE	**77**	**16**
Kosovo (2001)	**22**	**11**

Source: FAO Stat website

Fruit consumption in Kosovo is very low compared to other countries. Apple consumption is low.

Marketing channels

All major towns have permanent or temporary markets. Alongside local products, packed and non-packed, imports are sold at these markets. Both local and regional traders sell from the back of trucks. Sales are uncoordinated and in relatively small quantities. Market facilities are basic but are gradually being upgraded. Municipalities are responsible for managing the official markets but this is often delegated to traders who operate on a one-year license. Many sales take place at roadside locations as well.

The MSP survey found that commercial farmers sold their apples to: wholesaler (48%), green market (23%), supermarket (20%), retailer (6%), export (2%) and passing traders (2%). A survey among 1200 consumers showed that urban clients prefer to buy from supermarkets (70%) or greenmarkets (54%), while rural clients prefer to buy from farmers.

There is a considerable amount of trading going among traders. The MSP survey found that the 30 wholesalers they interviewed in 2006 purchased 48% of their produce from other traders. Some 37% was imported and 15% was from local producers. Another finding of the survey was that the imports of 30 traders consisted of:

	Import		Local production	
Cultivar	**Amount (t)**	**Wholesale Price**	**Amount (t)**	**Wholesale Price**
Ida Red	624	0.49	110	0.44
Red Delicious	399	0.49	30	0.45
Jonagold			13	0.38
Golden Delicious	183	0.47	9	-
Other	128	0.51	12	0.43
Total	**1,334**		**174**	

We can see that at the time of the survey (June 2006):

- Local production was only 12% of the total amount on the market
- Imported apples of the same variety get a higher price of 4-5 cents/kg, or 10%
- Imported apples of other varieties get a much higher price
- Ida Red covers less than half of the import; so it seems over-represented in the local production of commercial farmers (with 2/3 of the production).

Retailers were surveyed as well; 85% purchased from wholesalers and 15% from farmers. The main reasons for obtaining supplies directly from farmers were price and proximity.

Promotion
Few farmers and traders are actively promoting their products. The MSP survey found a significant preference for fruits produced in Kosovo (55%). This is confirmed by the perception that products from Kosovo are at least of an equal quality to imports (62%).

HPK introduced branding and logos with the slogans 'Nga toka jone ' and 'Natura'. The Fragaria Association of soft-fruit producers near Gjakova has been assisted to develop the brand name 'Fragaria' for fresh soft fruit and 'Freskia' for soft-fruit jam. Branding however proved difficult to sustain given the lack of legal protection available in Kosovo. In a similar way the MSP project provided support to:

- Kosova Fruits (UVB, Pema & Fruti) on apple boxes and brand stickers for apples.
- Anadrini on wooden boxes and nets for vegetables, and brand stickers for melons.

It also provided international expertise on packaging and labelling (incl. legislation). In general local stakeholders are hesitant to invest in promotion and donors have taken the lead.

Market prices
The prices of apples at the Prishtina wholesale market in the last three years oscillates between 0.35 and 0.55 Euro/kg in autumn. Prices differ per cultivar. The MSP survey found the following averages:

Table: Off farm prices in 2006 of 60 commercial apple farmers

Cultivar	Av. price (Euro/kg)
Granny Smith	0.45
Jona Gold	0.40
Golden Delicious	0.37
Red Delicious	0.37
Ida Red	0.35
Melrose	0.28

Compared with the wholesale prices (see above), a difference of 8-9 cents/kg or 25% is observed for Ida red and Red Delicious. For Jonagold the wholesale price is lower than the farmers' price.

3.1.12 Import and export

The next table shows the import of fruits in the last four years.

Table: Import of selected fruits in t and value (1.000 Euro) in 2004-2007

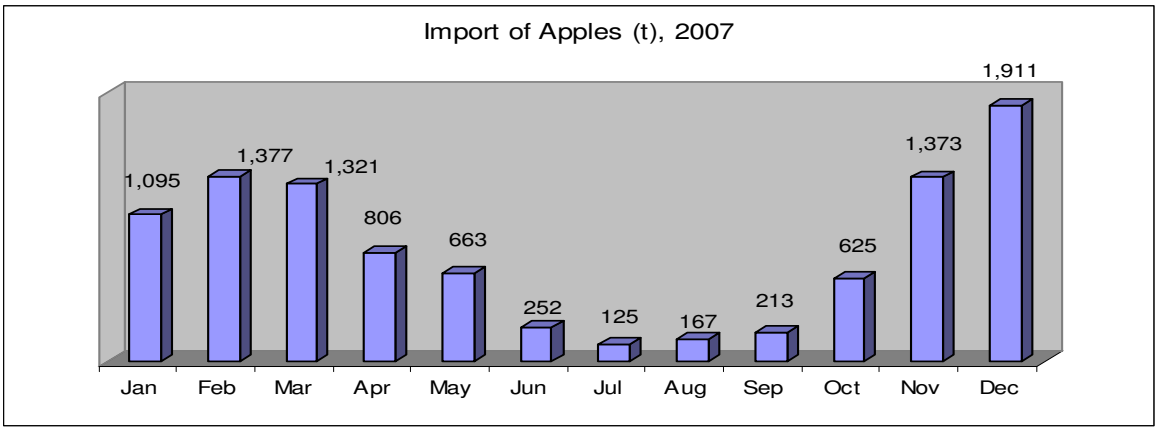
	2004		2005		2006		2007	
	t	Value	t	Value	t	Value	t	Value
Apple	8,201	1,695	11,716	2,535	10,759	2,325	9,929	2,355
Plums	0	0	281	57	475	100	470	137
Pears	301	112	887	298	981	356	1.292	494

Source: HPK data based on data from UNMIK

The import of apples is fairly stable; that of pears is increasing steadily and rapidly. The import of plums is increasing as well. Other fruits are less important. Annual apple imports represent a value of 2.5 million Euro. Pears are second with a value of half a million Euro.

The next graph shows how the import was divided over the year. Obviously imports are reduced during the months that local apples come to the market, but even in this period,

the import does continue, albeit at a low level.



Most apple imports come from Macedonia; about 8.000 t with a value of 1.8 million Euro. Next is Greece (1.300 t/ 325.000 Euro) and Italy (320 and 100.000).

3.2 Potential growth

In this paragraph the room for improvements is assessed. First, the potential to increase the productivity and income of farmers is assessed; secondly the potential increase in market demand in the next 5 years is estimated.

3.2.1 Increased productivity

The production technology used by apple farmers differs widely. The basic parameter is the planting density, which as such has many management implications. The next table provides the income per ha while using different practices.

Table: Income from one ha of apple in different systems

Plants/ha	Yield (kg/ha)	Price (Euro/-kg(	Gross income	Fix costs (Euro/ ha)	Var. cash costs (Euro/ha)	Family labour (Euro)	Income from land, and capital	Income from land, capital and family labour
	(a)	(b)	C = a x b	(d)	(e)	(f)	(c-d-e)	(c-d-e+f)
500	7,700	0.30	2,310	381	1,453	567	476	1,043
1.200	25,700	0.36	9,252	906	4,915	2,096	3,431	5,527
2.000	38,000	0.40	15,200	1,127	8,469	4,107	5,604	9,710

The cost price is fairly similar; resp. 24, 23 and 25 cents per kg. The profit per kg are resp. 6, 13 and 15 cents; so the margins are much more favourable for the intensive system. Combined with the increased yield, the income per ha with the intensive system is 9 times higher than with the extensive system. The semi-intensive system is intermediary.

3.2.2 Potential market growth

Starting from a consumption of 22 kg/cap (see 3.1.11) in 2001 and a growth rate of 2% p.a. consumption is 25.3 kg/cap in 2008 and 27.9 kg/cap in 2013, still below the Albanian

2003-level and the estimated consumption in Kosovo in 1988[10]. As population increases as well, the fruit market is assessed to increase from 52.000 t now to 63.500 t in 2013.

For apples this is 26.000 t in 2008 and 31.700 t in 2013; an increase of 5.700 t. Apples are produced in four production systems:

1. backyards, totally oriented to home consumption,
2. extensive orchards with low yields (7.7 t/ha) with some production marketed,
3. semi-intensive orchards (max. yield of 30 t/ha), all for the market
4. intensive orchards (max yield 45 t/ha) that are all marketed.

About half of the production comes from 6.000 ha of backyards. The quality of these trees will go down, and people will migrate to towns. Yet, people do plant new trees as well. It is assumed that production will be reduced by 2% p.a.; so in 2013 production will be 750 t lower than in 2008. Combining the effect of more demand and less home production, the potential market demand increases with 6.500 t in 2013.

Export has been a very limited and even with an annual growth of 40%, the expansion is limited to 200 t in 2013. Reducing import offers more chances: apple import has been 10.000 t in the last few years; of this 4.300 t is imported before the end of the year. This market could be captured. Indeed the projected import comes down from 10.500 t in 2008 to slight less than 7.000 t in 2013; adding an additional market demand of 3.700 t in 2013.

So the total expected additional demand for apples in 2013 is 10.200 t. Until 2013, 560 ha of apples orchards need to be planted to supply this. Probably in 2009 still a similar area of generative orchards are planted as in 2008 (60 ha), but this should be discouraged. As farmers (and extension workers) are not yet ready to plant intensive orchards, initially the focus will be on semi-intensive orchards: 70 ha in 2009 and 2010. After that, it could drop to 60 ha per year. The total until 2013 is 320 ha. At the same time, the area planted with intensive orchards should increase from 20 ha in 2009 to 70 ha in 2013. Production will continue to increase after 2013 and in 2015 exports will exceed imports. In 2018, total export needs to be 2.500 t. This requires substantial investments in storage.

[10] Data from: Pemëtaria në kosovë, a presentation by V. Avdiu, MAFRD

Table: scenario for the development of the area under apples until 2013

Annual growth		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
TOTAL FRUIT CONSUMPTION														
Population (million)	2%	1.98	2.02	2.06	2.10	2.14	2.19	2.23	2.27	2.32	2.37	2.41	2.46	2.51
Consumption (Kg/cap.)	2%	24.3	24.8	25.3	25.8	26.3	26.8	27.4	27.9	28.5	29.0	29.6	30.2	30.8
Total consumption(t)		48,114	50,058	52,080	54,184	56,373	58,651	61,020	63,485	66,050	68,719	71,495	74,383	77,388
Total apple consumption (46%)	**50%**	**24,057**	**25,029**	**26,040**	**27,092**	**28,187**	**29,325**	**30,510**	**31,743**	**33,025**	**34,359**	**35,747**	**37,192**	**38,694**
Home production in backyards														
Area under fruit	-2%	6,000	5,880	5,762	5,647	5,534	5,424	5,315	5,209	5,105	5,002	4,902	4,804	4,708
Total apple production (t)	**46%**	**8,280**	**8,114**	**7,952**	**7,793**	**7,637**	**7,484**	**7,335**	**7,188**	**7,044**	**6,903**	**6,765**	**6,630**	**6,497**
MARKET DEMAND FOR APPLES (t)		**15,777**	**16,915**	**18,088**	**19,299**	**20,549**	**21,841**	**23,175**	**24,555**	**25,981**	**27,456**	**28,982**	**30,562**	**32,197**
Market production in extensive orchards														
Area (under apples)	0%	515	515	515	515	515	515	515	515	515	515	515	515	515
Yield (t/ha; start at 7.7 t/ha)	2%	7.7	7.9	8.0	8.2	8.3	8.5	8.7	8.8	9.0	9.2	9.4	9.6	9.8
Total apple production (t)		3,966	4,045	4,126	4,208	4,292	4,378	4,466	4,555	4,646	4,739	4,834	4,931	5,029
Market production in generative orchards planted after 2006														
Max yield: 15 t/ha Area (ha)		30	30	60	60	0	0	0	0	0	0	0	0	0
Total production (t)		0	0	0	5	50	234	617	1,238	1,935	2,475	2,700	2,700	2,700
Market production existing, mature semi-intensive orchards														
Max. pod. 30 t/ha Area (ha)		93	0	0	0	0	0	0	0	0	0	0	0	0
Total production (t)		2,790	2,790	2,790	2,790	2,790	2,790	2,790	2,790	2,790	2,790	2,790	2,790	2,790
Market production in new semi-intensive orchards														
(newly planted) Area (ha)		60	50	70	70	70	60	60	60	0	0	0	0	0
Total production (t)		0	90	450	1,005	2,070	3,480	5,145	7,170	9,120	10,890	12,240	13,140	13,500
Market production in new intensive orchards														
Max 45 t/ha (newly planted) area (ha)		0	0	0	20	40	50	60	70	0	0	0	0	0
Total production (t)		**0**	**0**	**0**	**0**	**45**	**315**	**1,013**	**2,318**	**4,298**	**6,638**	**8,685**	**10,170**	**10,800**
TOTAL MARKET PRODUCTION APPLES		**6,756**	**6,925**	**7,366**	**8,008**	**9,247**	**11,197**	**14,030**	**18,070**	**22,789**	**27,532**	**31,249**	**33,731**	**34,819**
EXPORT (40% increase p.a.)		20	28	39	55	77	108	151	211	295	413	579	810	1,134
IMPORTS OF APPLES		9,042	10,018	10,761	11,346	11,379	10,751	9,296	6,695	3,487	337	-1,688	-2,359	-1,489
INCREASE IN VEG. APPLE ORCHARDS		**0**	**0**	**70**	**90**	**110**	**110**	**120**	**130**	**0**	**0**	**0**	**0**	**0**

3.3 Support needed

Having concluded that there is substantial room to increase fruit production, in terms of area and yield per ha, the questions arises how this can be achieved. Five perspectives will be used:

- access to input/technologies,
- access to markets,
- access to finance
- access to knowledge and skills
- policies and regulations.

This paragraph focuses on support to farmers, as this is critical. Yet with some support in (investing in) equipment, training and marketing (labelling, packaging, promotion) SMEs in processing could develop into larger companies, furnishing relatively high quality processed fruits to local markets. The support they require cannot be captured in general terms but should be based on an in-depth analysis of each company.

3.3.1 Access to inputs and technologies

In order to increase their productivity, farmers have to apply a number of technologies:

- Use sapling from vegetative rootstocks
- Use high quality (pure and disease free) saplings
- Use higher densities: at least 1.200 trees/ha and preferably 2.000 trees/ha.
- Use proper irrigation and fertilisation systems
- Improve pruning and thinning techniques to ensure a good balance between leaves and fruits that leads to high productivity without periodicity problems
- Use fences to avoid damage to the (lower branches of) fruit trees
- Use IPM to overcome crop disorders, while avoiding overuse of pesticides.

One opportunity to speed up seedling production is to use bench-grafting. Presently bud-grafting is done. This means that the final sapling is only coming to the market in 2 years. Saplings of a vegetative rootstock made via bench-grafting have a 1-year shorter production period, so they reduce the (labour) costs substantially.

The crucial technologies are embedded in saplings; these need to be of high quality (in phyto-sanitary terms) and of the right cultivar. The latter means that species/cultivars have to be planted that have a good market and sufficiently resistant to storage.

Provide a strong incentive to nurseries to produce high quality seedlings. Registered nurseries need to be inspected thoroughly and if found to be functioning well, be rewarded with a matching grant of 1:1. For every quality apple sapling they produce, they will be given a high quality, imported sapling for free. This will have a number of desired imapcts:

- nurseries get a strong incentive to register and to apply proper methods
- low quality nurseries become less profitable
- more high quality sapling will come on the market for a lower price; this will increase the competitivens of the sub-sector in the future
- MAFRD inspectors will be more motivated to do their job properly
- It will avoid creating overcapacity in nurseries; for the next few years many seedlings are needed to rehabilitate the industry, but in the long run (after 2013), this will be much less as the demand will be reduced to ‘replacement level’.

3.3.2 Access to markets

Improving quality
The key-technologies that the farmers have to apply are:

- More homogenous product (better grading and sorting). Apple grading charts have to be designed and distributed.
- Adjust the cultivars to the changing taste of the consumer. This means:
  - less Ida red
  - and more Fuji, Gala, Jonagold, Breaburn, Elstar
- IP-technique to avoid overuse of pesticides. A first step is to classify all pesticides and to regulate their use. Again: much training is needed.
- Improve pruning techniques so that fruits get sufficient sunlight to ripen evenly
- Better packing: carton boxes with logos/ brand-names. Carton producers can be supported to make appropopriate boxes for apples (and other fruits).

Diversification
This strategy is based on the situation with apples, yet there are more options. The import of plums seems to increase and particularly the import of pears is increasing rapidly. This offers good opportunity for farmers to diversify.

Within apple production, the room to diversify with cultivars is still substantial. For example, imports of Granny Smith are substantially higher than the proportion in the local production. Earlier and late varieties offer interesting options as well. Varieties with a long shelf life will have better markets. Some soft fruits, like blueberry and raspberry, offer good perspectives - particularly as some small-scale processors are interested in this.

Storage
Better storage can prolong the marketing period and is needed to be able to substitute imports. The quality of storage can be improved substantially, by improving insulation and airflows and the temperature and humidity in the store. Temperatures in local stores are too high during and just after the harvest and too cold during winter. The optimum temperature for storing apples is 0 degrees Celsius. During the initial months, farmers could open the doors of the store at night and close them during the day to bring down the temperature of the fruit and to maintain the consistency of the fruit pulp. Better air flows can be obtained by proper stacking of the boxes and creating air flow channels (of 5-10 cm) between pallets. The desired humidity level of 95% can be obtained by wetting the floor (obviously only when apples are stored on pallets). Encouraging farmers to use these techniques and providing them with simple thermo- and hygrometer can contribute much to better quality storage.

Thirdly, simple Styrofoam (5 cm) can be very well used for insulation. A layer of cement can be applied to protect it from damage. Simple trials showed fruit pulp temperatures consistently declined as the daily fluctuation from morning to night in the inside air temperatures and fruit pulp temperatures decreased. The total cash cost of insulating one simple farm store was only 400 Euro. Cold stores require much more investment: 400 - 500 Euro per tonne of storing capacity. With an additional 5-10% investment (incl. making the room airtight), a controlled atmosphere can be made.

3.3.3 Access to finance

The investment for one ha of semi-intensive orchards (1.200 trees/ha) is over 12.000 Euro. The main costs are related to infrastructure: 3.400 for irrigation (well, pump, pipes), 1.400 for a fence and 1.800 for posts. In total 6.600 Euro. Other costs are for seedlings (1.800 Euro), inputs (1.000), labour (1.200) and services (ploughing etc.; 1.200). Assuming farmers can invest labour and the costs for services, the additional cash needed is 10.000 Euro/ha. For intensive orchards this is some 15.000 Euro/ha.

The next table provides the cash flow of a 'model orchard'. Investments are just over 12.000 Euro and the farmer has a 5-year loan of 10.000, with a grace period of 2 years.

	1	2	3	4	5	6	7	8	9
Income		540	2,880	5,400	8,640	10,800	10,800	10,800	10,800
Costs	12,095	1,424	2,807	4,369	6,937	6,397	6,397	6,397	6,937
Annual net cash flow	(12,095)	(884)	73	1,031	1,703	4,403	4,403	4,403	3,863
Cumulative net cash flow	(12,095)	(12,979)	(12,906)	(11,875)	(10,172)	(5,770)	(1,367)	3,036	6,899
Principal balance	10,000	10,000	10,000	8,451	5,840	2,840			
Yearly interest (14%)		1,584	1,338	1,020	630	185			
Principal payment			1,549	2,611	3,000	2,840			
Cumulative cash flow	**(2,095)**	**(4,563)**	**(7,377)**	**(9,977)**	**(11,904)**	**(10,527)**	**(6,124)**	**(1,721)**	**2,141**

The max. yield has been put at 30 t/ha; which is sold for 36 cts/kg on average. It takes 7 years before the cumulative cash flow becomes positive. If farmers take a loan of 10.000 Euro with an interest rate of 14%, the cash flow is less negative, yet it takes 8 years to arrive at the break-even point. If one takes into account that during these years a farmer also has to use some income for family needs, the period to save sufficient income from an orchard to invest in a second one is well over ten years. So small farmers do not have sufficient financial means to invest in (semi-) intensive orchards and commercial credits are not attractive. On the other hand, it is in the national interest to produce more apples in Kosovo and to reduce imports.

The round table organised by the WG showed that stakeholders in the sub-sector prefer that government funds are to lower the interest rate of loans for orchards. Banks however do not think it feasible to provide loans for more than 5 years; so farmers should have some other income from which they can repay part of the loan. The next table shows the impact of subsidising the interest rate (of 14%) for a 5 years loan with a 2 years grace period.

Table: impact subsidy of interest of a loan of 10.000 Euro for a semi-intensive orchard

	1	2	3	4	5	6	7	8	9
Cumulative cash flow without subsidy	(12,095)	(12,979)	(12,906)	(11,875)	(10,172)	(5,770)	(1,367)	3,036	6,899
Cumulative cash flow with subsidy on interest rate (total subsidy in 5 years 4.750)	(2,095)	(2,979)	(4,455)	(6,035)	(7,333)	(5,770)	(1,367)	3,036	6,899
Cumulative cash flow with 3.500 cash subsidy at once (discounted total costs also 4.750)	(2,095)	(4,008)	(5,812)	(7,141)	(7,798)	(5,362)	(959)	3,444	7,306

Subsidising the interest rate reduces the max. negative cash flow substantially. It also ensures that the maximum negative cash balance is much later in the process (in year 5). The cost of subsidising the interest rate is 4.750 Euro over 5 years. If this is discounted with 10%, the present value is 3.500 Euro. Giving 3.500 Euro as a matching grant, the cash flow is initially more negative, but it is slightly better in the long run.

Farmers need to be supported financially to invest in orchards. A 30% contribution of the cash costs (or 3.500 Euro/ha) seems reasonable. Pre-conditions for support should be:

- The applicant should be fulltime farmer
- Planting more than 1.200 trees per ha on vegetative rootstocks
- Using certified saplings
- Have a contract with a certified extension worker who is paid for the services
- Min. surface: 0.5 ha; max. 3 ha.
- Min. amount: 1.500 Euro; max. 6.000 Euro

Substituting imports in the first half of the year (5.000 t) requires substantial investments in storage. With the estimated costs of 400 -500 Euro per t the total investment required is 2.5 million Euro; or 0.5 million per year. If MAFRD supports this with 30% (like with orchards), this is some 150.000 Euro p.a. More details on the set up of a direct payment scheme can be found in par. 7.3.

3.3.4 Access to knowledge and skills

Training and advice is needed on how to handle intensive orchards in terms of pruning, fertilisation, thinning and IPM. The number of people that have the knowledge and skills to do this is however very limited. Extension workers employed by municipalities are generalists who do not have the required experience and in-depth understanding to support specialised, commercial farmers[11]. So first of all training of trainers is needed.

Secondly, the institutional setting of extension has to be clarified. As this is an issue that is relevant for all sub-sectors it is dealt with in par. 7.4 on cross cutting themes.

3.3.5 Policies and regulations

The first and most urgent step is to organise a campaign to eradicate fire blight; a disease that can jeopardise all progress made so far. This could be done by MAFRD with support of HPK and CABI. This should be complemented with a survey into plum pox virus that could be equally destructive to plums, the second most important crop.

The most important task of the government is to ensure that healthy saplings are used. For this, MAFRD has already issued 7 administrative instructions, which among others

[11] This is not specific for Kosovo. In many less developed countries this is the case; even in some rich countries.

refer to the registration of nurseries, the labelling of saplings and control on the health of imported sapling via the CAC-plus methodology. The implementation of these orders is still weak and needs major improvement in both the inspection of imports as well as of seedlings produced by small nurseries that can still legally sell seedlings in their own villages.

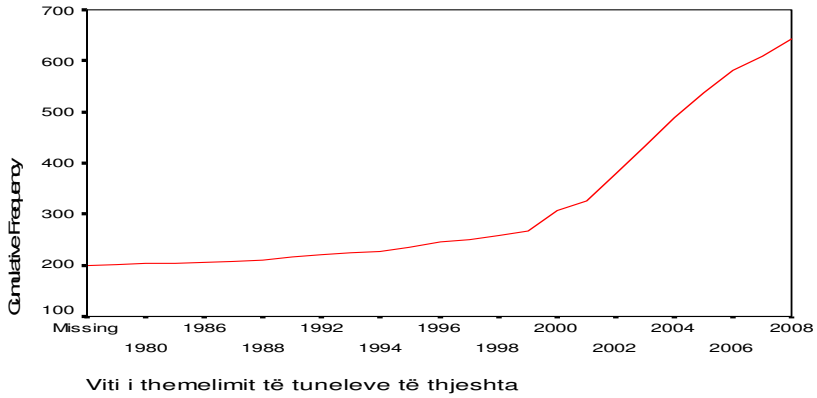
4 Vegetable production

4.1 Production system

4.1.1 Introduction

In ex-Yugoslavia vegetable production was based on machinery rings and supply to a large-scale processing sector. Now the cooperatives and large scale processors have collapsed and the old Yugoslav market of 22 million people, taking vast quantities of a limited range of vegetables from Kosovo, is replaced by a market of 2 million people demanding the whole range of vegetables. To adjust the production and marketing systems, new technologies are required and more investments. Particularly the number of (plastic) greenhouses increased dramatically since the war, as the graph below illustrates.

Graph 1: The development of the number of farmers with greenhouses



Since the war the number of greenhouse tripled: now 644 farmers have a greenhouse bigger than 250 s.m. All together they have 152 ha - an average 0.24 ha.

In this strategy open field, production and greenhouses production are treated separately. Pepper and cabbage are used as marker crops for open field production. For greenhouse production tomatoes, cucumber and pepper are the most prominant crops.

4.1.2 Total production

In 2005, vegetable production was estimated at 221,850 t: 202,500 from 14.500 ha of open fields and 19,350 from 470 ha of greenhouses. Average yields for open fields are given at 14 t/ha, and for greenhouse 55 t/ha[12]. The area per farm under vegetables is usually small; the next table (with 2005 data) from the ARDP gives an impression.

[12] Indeed dividing the total production of 19.350 t in greenhouses by 470 ha leads to 41 t/ha.

Table: Farm size distribution of vegetable farmers in 2005

	Open field		Greenhouse	
	Area (*are*)	Farmers	Area (*are*)	Farmers
Subsistence	20 <	140,000	10 <	125,00
Semi-commercial	20 – 80	5,000	10 – 20	173
Commercial	> 80	1,500	>20	100

Source: ARDP 2007-2013

It was estimated that 87% of the production comes from farms with less than 20 *are*[13] and that 25% of production is consumed on the farm, while the rest is marketed.

4.1.3 Climate

Kosovo can be subdivided into two plains. The north-eastern "Rrafshi i Kosovës", and south-western "Rrafshi i Dukagjinit". The border between the two forms the watershed between the Adriatic- on the one, and the Black Sea on the other side.

The climate in "Rrafshi i Kosovës", (incl. the Ibar-Valley), is influenced by continental air masses. Winters are colder with medium temperatures above –10 °C, (down to –26 °C). Summers are very hot with av. temp. of 20 °C, (up to 37 °C). Annual rainfall is 600 mm. The climate in "Rrafshi i Dukagjinit", is influenced by hot air masses crossing from the Adriatic Sea. Medium temperatures in winter range from 0.5 °C to 22.8 °C. Annual rainfall is 700 mm per year. Winter is characterized by heavy snowfall.

Based on the pluviometric coefficient of Emberger, Kosovo is less suitable for vegetable production under protected cultivation compared with the important areas of greenhouse production in Albania (Berat, Lushnja, Fier) and some regions of Macedonia. The "Rafshi i Kosoves" is even less suitable than Beograd area (Serbia). Prizren region could become a competitive vegetable producer in Western Balkans, due to its favorable pluviometric position compared with regions in Serbia (Beograd), Macedonia (Shtip) and N. Albania.

The amount of light during winter is insufficient for vegetable production under protected cultivation. The amount of sunshine hours in Oct–March ranges from 550 hrs (Peja) to 630 hrs (Pristina) which is considerably less than the minimum of 750 hrs needed for intensive vegetable winter production, even for less light demanded crops like tomatoes. The amount of light does allow winter production of lettuce and spinach.

The number of sunshine hours/day is another limiting factor. The minimum of 5 hrs/day is not found in any region. There is however a fast increase in the number of sunshine hours from the first decade of March. Considering that there is enough space for young, just transplanted plants, shifting the transplanting date towards the beginning of March, should be one of the most effective means to increase the earliness and to extend the vegetable production period in Kosovo greenhouses.

Table: Monthly average number of sunshine hours/day in different sites[14].

Stat./Month	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*
Peja	2.3	3.6	4.8	6.1	7.1	8.6	9.6	9.3	7.4	5.4	3.2	2.1
Prizreni	2.2	3.5	4.4	5.7	6.5	7.5	9.1	7.2	5	5.5	2.8	2.4
Prishtina	2.1	3.4	4.3	6	6.9	8.6	10	9.5	7.4	5.6	2.7	1.9

[13] 1 *are* is 100 square metres.
[14] Syle Tahirsylaj (IHMK). Te dhenat metereologjike te Kosoves. Personal communication.

The climatic difference explains why the main areas of vegetable production are Rahovec, Prizren and Viti. The main areas for greenhouses are Peja and Prizren, in the plains of Dukagjini. In this plain Mamusha municipality is the core-area of greenhouse production.

The 750 mm rainfall/year is not only insufficient; it is also not well spread, so during the vegetation period (April-Sept) irrigation is needed. So open field vegetable production is mainly organised in parcels alongside rivers. In some cases, some vegetables (onions and garlic) are also cultivated without irrigation.

4.1.4 Production systems

Open field
Open field vegetable are concentrated in Anadrine valley; a triangle in the Dukagjini plains between Rahovec, Jakova and Pizren. Some 3.000 ha of peppers is grown there (out of the total 5000 ha). Farmers know rotation is needed, but land is lacking. In this area, the rent for one ha is 1,500-2,000 Euro. All land is irrigated via a gravity system owned by a public company. The annual costs of irrigation are 100 Euro /ha.

Pepper production is concentrated in the western part as well. In 2005 the three main pepper growing areas were: Rahovec with 1.530 ha of pepper, Decan with 750 ha and Peja with 620 ha. In most of these areas more than half of the area is under pepper and farmers use the same land for 2-3 consecutive years. With only 1-2 cows per farm, there is not enough manure. Watermelon is the next important crop, while tomato production is shifting to greenhouses. The production of industrial tomatoes for processors has ceased.

Greenhouses[15]
Three different types of greenhouses are distinguished:

Simple Tunnels (SL)
These are constructed from various materials, mainly wood and other nondurable material. The height is not over 2.5m, ventilation is done from the back- and front side of tunnels. Tunnel covering is of poor quality with a durability of less than two years. In Mamusha (a high potential area), over 90% of the area is from simple tunnels.

Medium Technological Level (MTL)
These are tunnels with an improved structure and a high durability (metal structure with or without galvanisation). The height of these tunnels is over 2.5m, lateral ventilation is applied and the plastics have a durability of over two years.

Block System (BS)
A Bock System is comprised of two or more tunnels merged into one single production area. They are constructed from durable materials, use lateral ventilation and have a height of over 2.5m. The plastic in this system has a durability of 3 or more years.

The vast majority of simple tunnels are composed like “boxes”. The aim is to maximize the accumulation of solar energy inside and to conserve it, but this type of greenhouse is not able to release the excess heat in certain periods. Low gutter height and insufficient aeration (due to a lack of side windows) are serious obstacles to plant growth. High air temperatures and high air humidity are common, and a pour natural fruit setting is evident. Farmers take care against frost, but they are not yet convinced of the great negative impact high air temperatures have on plant viability and yield.

[15] All data in this section come from the Inventory of greenhouses by Prof. Gjonbalaj for PHK in August 2008

Only in the block system, 30% of the greenhouses are heated: 20% with wood and the remaining 10% with coal or gas. In the other systems, less than 5% is heated. Heating is only used for complementary heating, as systematic heating is not economically viable.

Most farmers with a simple tunnel use plastic that is only suitable for one or two years. Farmers with a more durable greenhouse use plastics that are more durable. Most farmers simply burn the used plastics or throw it away. Only 30% is used for other purposes or recycled.

Among the 644 farmers with greenhouses larger than 250 s.m., the survey found the following seize distribution.

Table : The area of greenhouses according to years (2005, 2008, 2011)

	0.025-0.20 Ha			0.21-0.60 Ha			Over 0.60 Ha			Total (Ha)		
	2005	2008	2011	2005	2008	2011	2005	2008	2011	2005	2008	2011
Simple tunnel	16	23	11	32	60	57	7	32	73	55	115	141
MTL	3	6	4	2	5	18	1	2	10	6	13	32
Block-system	5	8	6	4	10	14	3	6	10	12	24	31
Total	**24**	**37**	**21**	**38**	**75**	**89**	**11**	**40**	**93**	**73**	**152**	**203**

The data confirm the S-shape of the graph: while between 2005 and 2008 the area more than doubled, in the next 3 years the growth is only one third. Obviously, some new farmers will enter the scene, but this will most likely not change the overall picture.

While between 2005 and 2008, the growth in simple tunnels was fastest, in the next three years the growth in mid-level greenhouses will be much higher. In the same way, one can observe that greenhouses are rapidly becoming bigger.

The next table illustrates the dominant position of Mamusha in the greenhouse industry.

Table: Surface of the greenhouses in Mamusha area Ha(2005, 2008 and 2011)

Type of greenhouses	2005		2008		2011	
	Area	%	Area	%	Area	%
Simple tunnels	43	78	89	77	105	74
MTL	2	33	4	31	14	44
Block-system	0.5	4	2	8	2	6
Total	46	63	95	63	121	58

So 77% of all simple tunnels are in Mamusha, 31% of the mid-level greenhouses and 8% of the block-system greenhouses.

As the structure of simple tunnels is weak, heavy winds or snow can be catastrophic. Farmers often remove the plastic cover in winter. Some companies work on an improved construction model that can withstand nature better. The model that came out of this is suitable for Kosovo conditions, but it seems too expensive for the majority of farmers. Presently HPK supports new efforts to design a durable greenhouse for 15 Euro per s.m.

4.1.5 Crop husbandry

Crop management improved in the last few years. Drip irrigation and mulching are broadly used in greenhouses. New and better cultivars are in use, and there is a trend to use

more and better qualities of fertilizers and pesticides. Despite this, production technology can still be considered as extensive. The next table shows the relation between the type of greenhouse and the intensity of the production.

Table: Relation between the type of greenhouse and crops grown

Type of greenhouse	Tomatoes	Tomatoes, cucumber	Tomatoes, cucumber, pepper	Other combinations
Simple tunnels	24.2	33.7	11.4	30.7
MTL	17.4	23.9	14.1	44.6
Block-system	7.5	19.4	21.6	51.1

Many greenhouses are used to cultivate only one crop per year: from mid-March to mid-October. Sometimes, lettuce is used as the second crop during winter. This gives a very short period of greenhouse exploitation which is inefficient. While growers have the intention to be earlier with their production, heating is not financially feasible. The short harvesting season is caused by several factors: modest crop management practices, high air temperatures in May-August, lack of proper crop nutrition, inefficient methods of improving fruit setting and the lack of proper combination of different successive crops or cultivars.

Expanding the exploitation period of greenhouses by planting earlier seems realistic, but more climatic and field data are needed to elaborate this fully. The high air temperatures inside greenhouses in summer, due to the lack of proper aeration, can be considered as one of the main factors of the lownumber of fruits set and the fast plant senescence, resulting in a very short reproductive life.

Tomatoes and cucumbers are the most important. A lack of know how on new species and poor understanding on the potential profits that could be generated by new crops seem to be limiting factors for further diversification.

At the same time, growing practices must be improved in order to better exploit the potential yields of modern cultivars. This refers to plant density, plant spacing, plant training and pruning, fruit setting, fertilization and irrigation frequency and quantity. Hybrid seeds are needed and better seedlings. Traditional warm beds are used for seedling production, but planting is too close and, without the use of trays, transplanting is problematic. This means root systems have to be cut which leads to stress in the beginning of the season and a loss of some ten days' growth. Use of small tunnels would be an improvement.

The number of varieties is increasing and better, long shelf-life cultivars are already used. Still, in many greenhouses, the variety choice is not appropriate. Especially in cucumber, many farmers still use old fashion, monoic cultivars, which do not allow exploiting the greenhouse height effectively. Many of the tomatoes varieties used have been replaced in neighbouring countries a few years ago. Selection of varieties seems not to be done based on qualified advice or appropriate trials. All varieties are indeterminate cultivars, while determinate ones are very much appreciated for their earliness. Due to their intensive flowering and fruit setting, resulting in a short harvesting period, determinate cultivars could also be used in Kosovo conditions as a second crop in greenhouses.

MAFRD cooperates with HPK and CABI on an IP programme in tomato and cucumber production. Experts and farmers are trained in monitoring and combating pests and diseases with environmental-friendly pesticides.

4.1.6 Inputs

Nearly all inputs are imported: seeds, fertilizers, plastic, irrigation systems and pesticides. A number of input suppliers have representatives in the Dukagjini Plain to market their products; e.g. for tomato seeds well known companies are distributing quality seeds. Some 95% of tomato seeds are brought from these companies.

Relations between farmers and input suppliers are improving. Some input companies demonstrate their inputs in the field and distribute samples. Based on the results in demo-plots, they decide on what to do in the next season. Farmers often doubt the quality of basic fertilisers and pesticides.

The variety of agricultural inputs is limited, and so is the competition among suppliers, who seem to be less innovative than desirable. Some observe a "distance" between input dealers and farmers. One example is fertilisation. Overuse of chemical fertilizers is observed. Written recommendations provided to farmers are sometimes wrong. Insufficient information is available among input dealers, extension workers and farmers on the proper ratio and quantities of basic nutrients needed at different stages of specific crops. Soil salinity problems, due to fertilizer overdose, could become a prominent threat to many greenhouses.

In plant protection similar problems appear. The general approach is to spray (too much) chemical each time plants show any symptom (i.e. fungi, bacteria or virus). Very rarely, plant disorders are considered to be linked with poor climatic control, soil structure, lack, or excess of any nutrient, etc. There are many diseases in the Anadrini area; esp. Phythopthora capsici. No nematodes are reported as yet (only in greenhouse).

4.1.7 Yields

According to the ARDP average yield per ha for open field production is 14 t/ha, and for greenhouse 55 t. Obviously this needs further specification for different crops. In 2004 the following assessment was made[16].

		Yields in 2004		Potential production	
Crop	**Area (ha)**	**Yield (t/ha)**	**Production (t)**	**Yield (t/ha)**	**Production (t)**
Tomatoes	1,980	15.5	30,690	50	99,000
Peppers	4,750	10.0	47,500	25	118,750
Cucumber	401	20.0	8,020	30	12,030
Water melon	1,460	23.0	33,580	50	73,000
Cabbage	1,475	25.0	36,875	50	73,750
Onions	1,343	6.0	8,058	40	53,720
Garlic	182	3.2	582	8	1,456
Beans	184	3.5	644	5	920
Pumpkin	1,228	5.5	6,754	15	18,420
Carrots	125	9.0	1,125	40	5,000
Leek	107	25.0	2,675	30	3,210
Spinach	153	10.0	1,530	20	3,060
Green beans	93	1.1	102	2	186
Other	1,201	9.0	10,809	15	18,015
Potatoes	7,873	14.5	114,159	40	314,920
Total	**22,555**	**13.4**	**303,103**	**35**	**795,437**

[16] van Agthoven J and S. Kaciu, 2004. High Value Irrigated Crops. MAFRD/SOK.

Although the method used in these assessments is not known, its shows experts believe that most yields could well be doubled.

Studies done in preparation of this strategy lead to the following assessments. A single tomato crop in simple tunnels yields 87.5 t/ha; in MLT this is 150 t/ha; when a tomato crop is combined with cucumbers total yield us 178.5 t/ha. Pepper in a MLT yields 80 t/ha. In open field this is only 10 t/ha for extensive farmers; 22.5 t/ha for the current practices in the best area (Anadrini) and 45 t/ha if the best practice are applied.

4.1.8 Post harvest issue

Tomatoes are picked and immediately sent to the market; as there are no storing facilities. A number of farms pack tomatoes directly in wooden or carton boxes; others use bigger boxes when picking and then fill wooden boxes of 5-6 kg that are sent to the market. Very few use new boxes; farmers see these as too expensive. The classification and sorting of tomatoes is informal. Packing of tomatoes into boxes is done based on the shape, size and consistency. Usually there are two or three sizes in the same box (160-250gr).

For most vegetables, net bags are the main form of packaging. Imported produce is better graded, boxed and labeled.

4.1.9 Processing

Most vegetable conservation is done in households for their own needs. Small scale processing focuses on traditional products like pickled preserves from pepper, cabbage, cucumber, of ajvar (a popular sauce based on mashed peppers with additions of other vegetables), tomato paste, hot pepper sauce, dried peppers etc.

Mid-scale processing mostly refers to new enterprises or farmer organizations (mainly women), involved in partial processing. Among their products are pickled vegetables, ajvar, food supplements etc. Mid-scale initiatives have shown to be successful in their supply of raw materials (with some exceptions), as well as in marketing. The possibility for more formal commercialisation exists and particularly for niche markets (through retailers and catering establishments) for reliable, quality assured and unique production.

A few industrial scale processors are active; they face difficulties in raw material supply and they work mainly on the internal market. Some have stable exports such as Pestova, Progresi and Agroprodukti. Products involved are potatoes, tomatoes, peppers, mush-rooms, peas, beans, cucumbers, cabbages and carrots. Final products are potato chips, French fries, ketchup, different preserves, canned vegetables, ajvar etc.

According to ECIKS (Economic Initiative for Kosovo), all local processors cover just 30% of the local market. In general, they need to organize the collection of sufficient quantities of inputs (vegetables), which is not an easy task considering the very small size of the many production units and farms.

“Progresi” in Prizren has a line for vegetable conservation, processing and controlled storage. It uses 30% of its capacity, processing some 2.000 t annually: red peppers of Kapia variety (1.500 t), Baburet (350 t), Somborka (150 t) and Chili (feferon) peppers (100 t). All supplied by local farmers, except the chilli peppers imported from Macedonia (0.30-

0.40 Euro/kg). At the peak of production (Aug.-Sept.) it is impossible for the company to absorb all peppers on offer.

In Krusha e Madhe village a women association “Farmer Women” with the Swiss “Caritas” support started traditional pepper processing and sell it in jars of 2.5 kg. They plan to conserve 10 t of processed pepper products. Another initiative is from “Etlinger” company, which in collaboration with Mercy Corps has organized the production of spiral peppers in 7 hectares with the intention to buy all products. Their future plans involve conservation of 1,000 t of processed pepper (using chilli-, Kapia variety and tomato-shaped peppers). There seems to be a growing market for processed peppers. Growing peppers for the processing industry could become a viable option for large, cost-efficient farmers.

The constraints for fruit processing (see par. 3.1.10) are relevant for vegetable processing as well. An additional aspect is that for vegetables, the need to work with special varieties for industrial purposes is bigger; e.g., tomatoes used for making tomato paste need to have much higher dry matter content than fresh tomatoes to reduce transport and evaporation costs. Farmers will only grow these cultivars when they have a secure market; e.g. via a contract with a processor. At the moment processors cannot provide such security. Only Pestova is doing this successfully with potatoes.

4.1.10 Marketing

Market size
The ARDP estimates annual consumption of fresh vegetables per capita at 146 kg. As the next table shows this is an average figure in the region, but still 15% below the Albanian figure of 173 kg/cap.

Table: Vegetable consumption (kg/cap) in the region in 2003

Country	Consumption
Albania	173
Bosnia and Herzegovina	168
Bulgaria	144
Croatia	110
Hungary	117
Romania	179
Serbia / Montenegro	105
FYR of Macedonia	156
AVERAGE	**144**

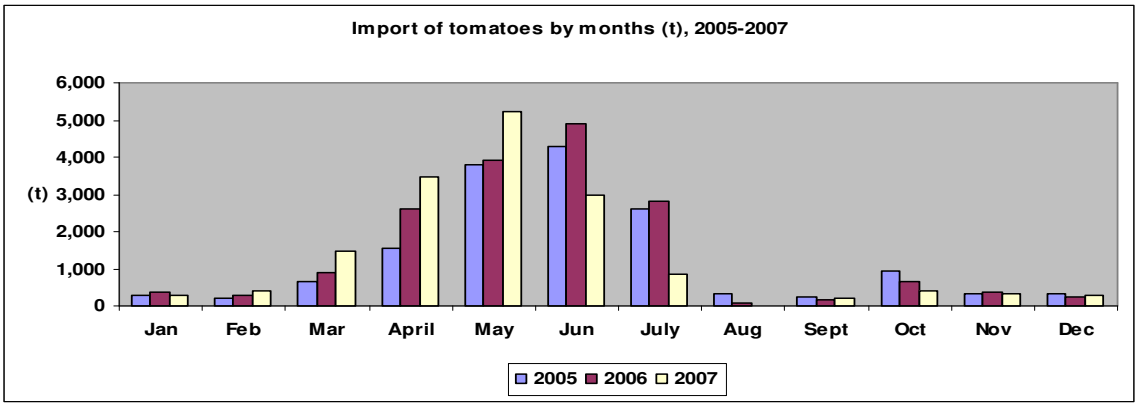
So there is room for improvement, also if one considers that the annual consumption of processed vegetables of 1.5 kg/capita is very low compared with 8-12 kg/capita in the EU. The explanation of both figures is that families buy large amounts of fresh vegetables in season and pickle them at home.

Marketing channels
Vegetables are sold in local markets, mini-markets and super markets. In the main harvest season, farmers as well as traders sell their produce from trucks outside the main towns. Imported vegetables dominate out of season. As 75% of the processed vegetables are imported; imports dominate the market throughout the year.

4.1.11 Export and imports

Imports
According to the ARDP Kosovo farms supply 75% of the domestic demand for fresh vegetables. In 2007 37,686 t of fresh temperate vegetables with a declared value of €10.3 million was imported. Macedonia (16.500 t with a value of 2.6 million Euro) and Turkey (13.800 t and 5.1 million Euro) are the main sources. The import in 2007 was some 10% below the 2006- and 2005 level.

Tomatoes are the most imported fresh vegetables with 15.-16000 t annually, followed by peppers and cabbage (6.500 t each), cucumber (4.500 t) and onions (2.500 t and down from 6.500 in 2005, so a rapid decline). A crucial element in the strategic planning is the timing of imports. The next graph shows this for the marker crop tomatoes.



Source: UNMIK Customs service 2007

Obviously, imports are limited in the period that local production is maximal: July- Sept. In this period a process of import substitution is going on. In 2007 tomato imports were lower than in 2006 in all months after June. For cucumber this happened for the period April-October.

Exports
In 2007 Kosovo exported 5.500 t of vegetable with a value of half a million Euro. Cabbage export was highest with 975 t, followed by onions (890 t), tomatoes (855 t) and pepper (730 t). Main importers were Montenegro (1.500 t for 175 thousand Euro), Bulgaria (resp. 500 and 33), Albania (470 and 98) and Serbia (320 and 60). The value of vegetable exports show a clear upwards trend since 2004, but the absolute values remain very low. The value of total vegetable exports represents only 4% of vegetables imports.

4.2 Potential growth

4.2.1 Increased productivity

Greenhouses
The income from vegetable using different practices is presented in the next table:

Table: Economic analysis of different greenhouses cultures

	Yield (kg.ha)	Price (Euro/kg)	Gross income (Euro/ha)	Fix costs (Euro/ha)	Var. Costs (Euro/ha)	Family Labour (Euro/ha)	Income from land and capital (Euro/ha)	Income from land, capital and labour (Euro/ha)
	(a)	(b)	c = a x b	(d)	€	(f)	(c-d-e)	(c-d-e+f)
Tomatoes simple tunnel	87,500	0.34	29,750	5,870	23,496	9,000	384	9,384
Tomatoes mid level greenhouse	150,000	0.34	51,000	12,250	33,640	13,000	5,110	18,110
Tomato/cucumber in mid level GH	178,500	0.39	69,615	12,250	52,419	20,944	4,947	25,891
Lettuce, second crop in mid level	33,000	0.60	19,800	150	13,936	4,650	5,714	10,364
Peppers in mid level greenhouse	80,000	0.56	44,800	12,250	27,600	10,500	4,950	15,450

Source: calculations of the WG.

Farmers with simple tunnels are basically employing themselves (during summer). There is no return to land and capital, all income has to be used to pay oneself for the many hours worked. These data are based on labour cost of 10 Euro/day, so using external labour (at 15 Euro/day) leads to a negative return to land and capital.

In MLT even a single tomato crop doubles incomes and this is not only composed of labour income; there is also a return of 5.000 Euro on land and capital. With cucumbers as a second crop, the return to investments is the same, but more hours can be worked. If lettuce is grown (as second or third crop), another 5.700 profit can be made on the investments and an additional 4.650 income from labour. It is estimated that about half of the farmers with mid-level greenhouses grown lettuce as a third crop. Peppers in mid-level greenhouses offer similar returns to investments, yet they require less labour. In the future, with a growing area of tomatoes (in simple tunnels) the price of peppers might be sustained better. Pepper can be grown as a second crop as well.

Open fields

The income farmers get from vegetables in the open field is presented in the next table:

Table: Economic analysis of different open field cultures

	Yield (kg/ha)	Price (Euro/kg)	Gross income (Euro/ha)	Fix costs (Euro/ha)	Var. Costs (Euro/ha)	Family Labour (Euro/ha)	Income from land and capital (Euro/ha)	Income from land, capital and labour (Euro/ha)
	(a)	(b)	c = a x b	(d)	€	(f)	(c-d-e)	(c-d-e+f)
Pepper, extensive	10,000	0.25	2,500	600	2,146	924	-246	678
Pepper current practice Anadrini	22,500	0.25	5,625	600	4,481	2,146	544	2,690
Pepper best practice	45,000	0.30	13,500	680	9,806	3,501	3,014	6,515
Cabbage current practice,	50,000	0.15	7,500	50	1,975	340	5,475	5,815

Source: calculations of the WG.

The extensive system does not lead to any return to investment; it only provides work. Current practices in the best area (Anadrini) gives better returns and the best practices provide good returns, as does growing cabbage. Considering that investments are much lower, the returns are remarkably close to those of greenhouses.

4.2.2 Potential market growth

The potential to grow depends on four issues:

a. Growth of consumption due to population growth and higher consumption per cap.
b. Replacement of small, subsistence farms by viable family farms
c. Import substitution
d. Export potential

Population and consumption growth
According to the ARDP in 2005 consumption of greenhouse vegetables was 10 kg/cap; in 2008 this is assumed to be 11 kg/cap. Imports of tomatoes, cucumber and pepper are added to this: in total 13 kg/cap. So consumption is put at 24 kg/cap in 2008; or 49.500 t in total. A population and consumption growth of 2% each, lead in 2013 to an additional consumption of 11.000 t compared to 2008.

Reduction of subsistence farmers
The ARDP estimated that in 2005 there were 470 ha of greenhouses, of which 150 were (semi-) commercial. This leaves 320 ha of very small, subsistence oriented greenhouses. No data are available on how this develops, but with an ongoing urbanization and economic growth, it is assumed to be reduced by 5% per year.

Import substitution
A recent report on the potential of greenhouses in Kosovo[17] concluded that much of the imports could be substituted:

> Tomatoes. 'By introducing better designed greenhouses and upgrading current production technologies Kosovo has the potential to substitute tomato imports from very beginning of June till beginning of November, but it will continue to depend on imports for the rest of year.' In practice: substitute some 4.300 t of imports.
>
> Peppers. Using modern cultivation methods in the open field and by shifting pepper cultivation to greenhouses it is possible to substitute pepper imports of at least the second half of May, and to fully supply market demands for the other period till the first frosts (end of Oct. or beginning of Nov.). In practice: substitute 3.500 t.
>
> Cucumbers. By increasing greenhouse area, the possibility to fully substitute cucumber imports in May and June is realistic. Meantime, by applying second greenhouse cropping with appropriate cultivars, the second peak of cucumber imports (Sept. – Oct.) can be totally substituted. In practice: substitute 3.000 t.
>
> Secondary crops. By promoting second crops in simple greenhouses also spinach and lettuce imports (resp. 22 – and 125 t in 2007) in Nov.-March can be substituted.

So 12.000 t of imports can be substituted, including a shift of peppers into greenhouses.

Export potential
No studies have been done on the competitiveness of greenhouse production in Kosovo, so it is hard to assess the export potential. The cost price of tomatoes in tunnels and MLT is resp. 34 and 31 cents/kg. In Albania this is 28 cents. This does not prevent some

[17] Balliu, A. and S. Kaciu. 2008. The potential of greenhouse industry in Kosovo. PHK.

exports to Montenegro or North Albania in certain periods of the year, but no dramatic growth in export is expected. Tomato exports increased in 2007 (from a very low level), and it is assumed to increase further with 10% per year; leading to additional growth of some 1.000 t in 2013. In the next table these data are included in a scenario. As there is a lack of reliable data, these are only guestimates made by the WG.

Table: scenario for the development of the area with greenhouses

	Annual growth	2008	2009	2010	2011	2012	2013
TOTAL CONSUMPTION of tomatoes, cucumbers and pepper							
Population (million)	2%	2.06	2.10	2.14	2.19	2.23	2.27
Consumption (Kg/cap.)	2%	24.0	24.5	25.0	25.5	26.0	26.5
Total consumption(t)		49,440	51,437	53,515	55,677	57,927	60,267
Home production in backyards							
Area (ha)	-5%	320	304	289	274	261	248
Yield (t/ha)	0%	22	22	22	22	22	22
Total production (t)		7,040	6,688	6,354	6,036	5,734	5,447
MARKET DEMAND (t)		42,400	44,749	47,162	49,641	52,192	54,819
EXPORT (10% growth p.a.)		1,600	1,760	1,936	2,130	2,343	2,577
IMPORTS (t)		28,330	27,795	26,599	24,537	21,339	16,650
Production in simple tunnels							
Area (ha)	10%	115	127	139	**153**	168	185
Development of yields (%)	2%	88	89.8	91.6	93.4	95.3	97.2
Total production (t)		10,120	11,355	12,740	14,294	16,038	17,995
Production in mid-level greenhouses							
Area (ha)	30%	37	48	63	**81**	106	137
Development of yields (%)	2%	150	153.0	156.1	159.2	162.4	165.6
Total production (t)		2,805	5,550	7,359	9,758	12,940	17,158
TOTAL LOCAL PRODUCTION		22,710	25,402	28,852	33,270	38,930	46,194
INCREASE IN SIMPLE TUNNELS		0	11.5	12.7	13.9	15.3	16.8
INCREASE IN MID-LEVEL GH		0	11.1	14.4	18.8	24.4	31.7

In this scenario an additional 170 ha are needed: 70 ha of tunnels and 100 ha of mid-level greenhouses. The inventory among greenhouse farmers in 2008 showed that 516 of them (81%) are planning to expand their production. The key to success is to ensure that they invest in MLT as this is more profitable and leads to a longer harvesting period.

Open field

Population and consumption growth

Consumption in 2008 is estimated at 124 kg/cap, based on the ARDP-estimate that in 2005 total vegetable consumption was 296.000 t; with a population of 2 million and a consumption of 24 kg/cap. of greenhouse vegetables. Population growth is again put at 2 % p.a., but the growth in consumption is supposed to be 1 % as consumption compared to other countries is relatively high (in comparison to e.g. fruits). This leads to an increase in consumption of 41.000 t. In 2013 consumption will be 130 kg/cap. Combined with 26 kg/cap of greenhouse vegetables it comes to 156 kg/cap.

Reduction of subsistence farmers

Data on the area under vegetable are rare and different sources come to different figures. Here we assume the area under vegetable to be 16.000 ha in 2008 and it is assumed that with ongoing urbanization and economic growth, this will be reduced by 5% per year.

Imports
The Working Group estimated that the following imports can be substituted:

a. Onion: 1.900 t whole year
b. Cabbage: 1.000 t in the period June- Oct
c. Carrot: 800 t whole year.

So some 3.700 t that is currently imported can be produced locally. In the scenario, the import substitution reaches 4.000 t. As we will see below, imports of the main crop pepper can be reduced to virtually zero in the period half May- en of October. This can be achieved by growing more peppers in greenhouses (see below); here we focus on crops that will remain typical field vegetable.

Export potential
The competitiveness of open field production is also not known, but the cost price for pepper is well below the costs price in Albania (25 versus 39 cents). Export of open field vegetables is growing rather rapidly, although from a low initial level. In 2007, it was some 2.500 t, mostly cabbage and peppers and it is assumed to grow at 25% p.a.. This means in 2013 over 7.600 t can be exported.

Table: Scenario for the development of the area with open field vegetables

	Annual growth	2008	2009	2010	2011	2012	2013
TOTAL CONSUMPTION OF OPEN FIELD VEGETABLES							
Population (million)	2%	2.06	2.10	2.14	2.19	2.23	2.27
Consumption (Kg/cap.)	1.0%	124.0	125.2	126.5	127.8	129.0	130.3
Total consumption(t)		255,439	263,153	271,100	279,288	287,722	296,411
Home production in backyards							
Area (ha)	-5%	7,500	7,125	6,769	6,430	6,109	5,803
Yield (t/ha)	0%	10	10.0	10.0	10.0	10.0	10.0
Total production (t)		75,000	71,250	67,688	64,303	61,088	58,034
MARKET DEMAND (t)		180,439	193,206	206,104	219,153	232,374	245,788
EXPORT (25% growth p.a.)		2,500	3,125	3,906	4,883	6,104	7,629
IMPORTS (t)		22,939	24,025	24,254	23,567	21,907	19,211
Production in extensive systems							
Area (ha)	0%	5,000	5,000	5,000	5,000	5,000	5,000
Development of yields (%)	2%	14	14.3	14.6	14.9	15.2	15.5
Total production (t)		70,000	71,400	72,828	74,285	75,770	77,286
Production in current commercial practices (Anadrini)							
Area (ha)	2%	3,000	3,060	3,121	3,184	3,247	3,312
Development of yields (%)	8%	22.5	24.3	26.2	28.3	30.6	33.1
Total production (t)		67,500	74,358	81,913	90,235	99,403	109,502
Production in best commercial practices							
Area (ha)	10%	500	550	605	666	732	805
Development of yields (%)	2%	45	46	47	48	49	50
Total production (t)		22,500	25,245	28,325	31,781	35,658	40,008
TOTAL LOCAL PRODUCTION		235,000	242,253	250,753	260,603	271,919	284,830
INCREASE IN COMMERCIAL PRAC.		0	60	61	62	64	65
INCREASE IN BEST PRACTCIES		0	50	55	61	67	73

In this scenario the area of vegetables decreases from 16.000 ha to slightly less than 15.000 while the average yields increase with one third (from 14.8 t/ha to 19.6 t/ha).

4.3 Support needed

The overall aim for providing support to greenhouse production is to extend the harvest season in order to reduce imports. A second aim is to reduce the cost price and increase farmers' incomes.

4.3.1 Access to inputs and technologies

Greenhouse production
Many issues can be improved in this sub-sector. The main ones[18] are summarised here:

Greenhouse design and construction improvement.

- Increase the use of plastic films to improve the earliness and enhance the yield of crops like watermelon, melon, cucumbers, peppers, etc., by using small tunnels. Small tunnels inside greenhouses is an important tool to plant earlier.
- Improving greenhouse aeration. Even wooden constructed greenhouses must be equipped with simple hand-operated side windows. This will keep air temperatures under control and consequently expand the plant life and harvesting period.
- Increase greenhouse gutter height to 2.5- 2.8 m to offer more space for plant growth and higher yields. It will also contribute to less temperature and humidity fluctuations which both contribute to less disease and longer harvesting period.
- Improve the quality of covering plastic films to expand the exploitation period, to go even all-year-round (with lettuce). Use long life polyethylene films.
- Use multi-span greenhouses to reduce construction cost per s.m. Using large spans (> 5 m.) would allow mechanization of some processes in the greenhouses.

Crop diversity and variety improvement.

- Promote the introduction of new varieties by private seed companies.
- Enhance crop diversity: pepper, eggplant, melon and French beans. Financial calculations may show the advantage these crops. Technical assistance is needed.
- Introduce (semi-) determinate tomato cultivars to increase earliness. They can expand the harvesting period in the autumn (as a second crop after cucumbers, melons). Careful selection of varieties is needed (good fruit setting in low light intensity, low temperature, high yield, long shelf life, appropriate fruit shape/size).

Improving crop management.

- Expand the exploitation period by improving aeration and plant nutrition and by two crops per year. Planting peppers or eggplants allows a longer harvesting period from early May to the beginning of November. This requires technical assistance and better (more resistant) quality polyethylene films.
- Improve crop nutrition. Train extension workers and input dealers. Compile a simple extension publication on fertigation methods and simple methods of fertilizer calculations. This will help for a better understanding of plant feeding. Shift from quantitative method of fertigation, to the proportional one.
- Improve fruit setting. This is one of the most challenging issues for tomato and pepper. Promote the use of bumble bees for fruit pollination in greenhouses.

[18] This section is based on the report Prof Prof. Balliu of Tirana University in June 2008, on request of PHK

Open field production
To improve the productivity of open field vegetables, the following can be done[19]:

- Choosing quality seeds (hybrids) to plant
- Proper preparation of seedlings, by using appropriate substrate, in modules (without using bare-rooted transplantation to the final ground)
- Proper land preparation before seedling transplant.
- Covering plants (black mulch) to protect them from low temperatures in the early stages. This leads to earlier ripening of fruits by 15-20 days and to higher yields.
- Utilisation of drip irrigation
- proper fertilisation (incl. base fertilisation / soluble fertilisers via drip irrigation)
- Application of proper IPM methods.

By applying the above-mentioned measures in pepper production double the MAFRD declared average yield (23 t/ha) could be achieved and the harvest can be 3 weeks earlier; at the end of June rather than July 15th to 20th.

4.3.2 Access to markets

The first priority is to come to the market earlier, in order to benefit from higher prices. To harvest earlier, one has to invest in mid-level greenhouses and in early seedling production. Earliness is also the key to getting higher poduction and to substitute imports.

The next table shows the impact of transplanting tomato seedlings one month earlier: an addional yield of 13.7 t/ha and much higher yields in June when the price is still good.

Table: Tomato yield (kg/s.m.) in Dukagjinit, by transplanting date in greenhouse[20]

Transpl.data	Total	June	July	August	September
16-Mar	5.38	1.22	2.96	1.2	
26-Mar	5.51	1.2	2.56	1.4	0.35
6-Apr	4.46	0.75	2.21	1.17	0.33
16-Apr	4.01	0.39	1.75	1.28	0.59

Determinate tomato cultivars can be used to harvest earlier. It can also be used as a second crop, in autumn. Other measures already mentioned are: diversification (melons, squashes, French beans, etc.) and using late varieties and those with a longer shelf life.

Marketing as such can be improved by better sorting/grading and with better packing materials like carton boxes with a trademarks and labels. Experiences in Albania suggests that offering a good homogenous product is the first step to better marketing.

4.3.3 Access to finance

Green houses
There is room for 70 ha of additional simple tunnels and 100 ha of mid-level greenhouses. The costs of a simple tunnel is 40.000 Euro/ha and of a mid-level greenhouse 150.000 Euro/ha. So total investment is resp. 2.8 and 15 million Euro in the next five years.

The inventory showed that 81% of the farmers are planning to expand their farm. The next graphs shows where they think to get the necessary capital.

[19] Based on: Kaciu, S. 2008. Study of existing situation on growing pepper in Kosovo
[20] Isuf Lushi. PhD course. Study of different aspects of tomato production technology. Pers. Comm..

Table: expected source of capital to expand greenhouses

	Number of farmers	%
Credits from banks	93	18.0
Own savings	251	48.6
Credits & savings	86	16.7
Other sources	86	16.7
Total	**516**	**100.0**

Source: Inventory of greenhouses

Half of the farmers think to use their own savings. Two thirds of the others hope to get a loan. The amount farmers can invest is limited. Most likely most of them think to invest in simple tunnels, which costs some 40.000 Euro/ha. The next table illustrates this.

Table: Impact of investments on income of farmers

	Income (Euro/ha)	Investment needed per ha (Euro)	Area with 20.000 Euro	Income from 20.000 investment	Income with 30% invest-ment subsidy	Income per day	Cost price per kg
	(a)	(b)	I	d = a x c	(e)	(f)	(g)
Tomatoes in simple tunnel	9,384	40.000	0.5	4,692	6,703	10.4	0.336
Tomatoes mid level greenhouse	18,110	150.000	0.133	2,415	3,450	13.9	0.306
Tomato/cucumber in mid level GH	25,891	150.000	0.133	3,452	4,932	12.4	
Peppers in mid level greenhouse	15,450	150.000	0.133	2,060	2,943	14.7	0.498

Source: calculations of the WG.

The table shows that the income from an investment of 20.000 Euro in simple tunnels is higher than from the same investments in a (smaller) mid-level greenhouse. However, in the (near) future this will lead to overproduction in summer and a drop in prices. Therefore, from a long term, national point of view MLT are much more important to substitute imports. The cost price of tomatoes from mid-level greenhouses is also slightly lower. To stimulate farmers to invest in MLT, a matching grant of 30% on cash investments is needed. Then these farmers receive as similar income from the same investment, while they are more efficient. To do this the following budget is needed:

Table: investment needed to develop the area with greenhouses (in 1.000 Euro)

Annual growth	2008	2009	2010	2011	2012	2013	Total
INCREASE IN SIMPLE TUNNELS	0	11.5	12.7	13.9	15.3	16.8	70.2 ha
Farmers contribution (50%)	0	230	253	278	306	337	**1,404**
Bank loan (50%)	0	230	253	278	306	337	**1,404**
							2.808
INCREASE IN MID-LEVEL	0.0	11.1	14.4	18.8	24.4	31.7	100.4 ha
Farmers contribution (40%)	0	666	866	1,126	1,463	1,902	**6,022**
Bank loan (30%)	0	499	649	844	1,097	1,427	**4,517**
Grant (30%)	0	499	649	844	1,097	1,427	**4,517**
TOTAL INVESTMENT	**0**	**1,665**	**2,164**	**2,814**	**3,658**	**4,755**	**15,056**

In total nearly 18 million Euro is needed. A support of 4.5 million via grants (in five years) by the MAFRD could direct these investments in the right direction: mid-level greenhouses. Only those with experience in greenhouse production should get this support. At the same time, those working on an improved design for greenhouses for a reasonable price per s.m. need to be supported with technical assistance.

Open field
The investment for 1 ha of open field vegetables is 6.000 Euro, most of it for inputs, while long term investments are limited. Most of the capital needed can be financed by farmers or by seasonal loans (from banks or MFIs). Probably the biggest problem for these loans is the poor functioning of the land market that makes it difficulty to use land as collateral. Another constraint could be the need to invest in mechanisation and general farm outlays.

4.3.4 Access to knowledge and skills

The need for farmers to get access to new knowledge is huge. This concerns impartial information on inputs (seeds, fertilisers, pesticides, plastics etc.). Some of the new knowledge still needs to be generated in comparative trials under Kosovo (farmers') conditions.

Farmers need many new skills: micro-climate control in greenhouses, enhancing fruit setting, thinning of leaves, improving plant nutrition, diversification of cropping patterns, reducing pesticide use and general IPM techniques. The work by CABI on introducing IPM is crucial as it can substantially reduce the use of pesticides, which is essential to improve the quality of the produce, to protect the health of consumers and to increase farmers' incomes. Par 7.4 explores how the extension efforts could be organised.

4.3.5 Policies and regulations

In the short term vegetable production is directed by private actors. Financial, technical and market issues are crucial. The main longer term policy issue is the creation of a legal framework to enhance environmentally-friendly production methods. This can be captured under the notion of Integrated Production, but refers also to the need to dispose of used plastics in a proper way.

Another policy issue is the design and enforcement of quality standards and creating a proper institutional environment for certification systems (either for IPM, organic farming, Global GAP or any other standard.).

Open field vegetable production would profit much from improving general policies on land ownership (creating a functional land market) and irrigation.

5 Grape and wine production

5.1 Production system

5.1.1 Introduction

Archaeological discoveries date the first vineyards in Kosovo at 2000 years ago. The tradition of grape cultivation and processing has continued until today. Suitable agro-ecologic conditions, love and willingness to produce and process grape into wine and rakia have been a key factor in this tradition. Vineyards had their ups-and-downs. Significant damage of vineyards occurred in 1913-1923 when phylloxera ruined almost all vineyards. After this, new vineyards were raised with saplings resistant to phylloxera.

The most successful period were the 80'ies, when Kosovo had nearly 9.000 ha of vineyards. A factory in Rahovec could produce 50 million litres of wine annually. At its peak, export was 40 million litres; mostly to Germany. During the war the area under vineyard declined drastically. Vineyards in the SOE sector such as "Mirusha", Malisheva and "Vreshtaria" in Prizren, as well as "Dubrava" in Istog were totally ruined.

5.1.2 Production data

In recent years a consensus developed that there are 4.500 ha of grapes. Recent EVV data collected by municipalities, show a total of 4.437 ha. However in 2002 the SWIK project already estimated the area to be much smaller: 3.650 ha, of which 2.500 ha in Rahovec. In 2008 a detailed survey of all vineyards in Rahovec proved that the area under vineyards is 1.969 ha. Assuming that in other areas also 20% has been lost since the SWIK estimates, the area under grapes is around 2.900 ha, or one third less than a few years ago. Also the wine production is about one third less. While in 2004/5 the formal wine industry produced 9 million litres per year, after 2006 this was less than 6 million.

5.1.3 Climate

Kosovo has a mild continental climate influenced by the Mediterranean climate which penetrates to Dukagjini Plane through the valley of Drini i Bardhë. Winters are usually cold whilst summers are hot. Agro-climatic conditions for vineyards are suitable, especially for early varieties; late varieties might get problems in the harvesting stage.

There are more than 200 sunny days annually to help ripen the grapes, on par with some well known wine production regions. Vineyards are mainly raised in steep hilly areas which are well exposed to the sun. The elevation in areas of Kosovo where grape is cultivated is varies from 350 to 600 metres. Land conditions favour vineyard development as often the land can hardly be used for other purposes.

5.1.4 Varieties

Dozens of grape varieties are cultivated for different purposes. The next table lists the major ones and the area they covered in 2002 (statistical data) and in 2008 in Rahovec (data from the Geo-Land study).

Table: Area under different wine grape varieties in 2002 and 2008

	Red varieties					White varieties			
	Area in 2002 in Kosovo	Area in Rahovec in 2002	Area in Rahovec in 2008	% remained in 2008		Area in 2002	Area in Rahovec in 2002	Area in Rahovec in 2008	% of 2008 remained
Black gamay	709	495	232	47	Smederevka	600	534	333	62
Procupak	578	358	208	58	Italian Riesling	458	210	189	90
Pinot Noir	339	88	67	76	Rkaciteli	140	13	8	60
Vranac	197	141	298	211	Zhuplanka	135	38	12	32
Colored Gamay	121	21	7	33	Rhein Riesling	128	28	25	90
Fancovka	120	41	14	34	Sauvignon	36	0		0
Zhametna	103	30	100	335	Semion	26	5		0
Merlot	55	50	17	34	Zhilavka	20	5	3	57
Cabernet Sauvignon	23	2		0	Pinot Blanc	20	1	2	177
Cabernet Franc	19	2	25	1116	Chardonnay	17	13	22	174
Alicante Bousché	17	3		0	Muscat Otonel	6	0		0
Other	50	26	9	34	Other	20	2	9	367
TOTAL	**2,331**	**1,257**	**977**	**78**	**TOTAL**	**1,607**	**849**	**603**	**71**

According to 2002 statistics, the area of wine grapes in 2002 was nearly 4000 ha, of which 2,100 in Rahovec. In 2008 the area in Rahovec proved to be 1.580 ha. As nearly 70% of the total area is estimated to be in Rahovec the area under wine grapes in Kosovo can be estimated to be around 2,300 ha in 2008. Since Vranac is actually used as a table grape, the area under wine grapes is put at 2.000 ha.

Therefore, between 2002 and 2008 about one quarter of all vineyards was lost in Rahovec; white wines lost 29%, red wines 22%. Some cultivars faired much better. The area under Vranac increased with 100 ha and under Zhametna with 70 ha. This first is due to the fact that it can be used as table grapes as well. The second is a very traditional variety.

The next table looks at the quality of the wine that got lost. Three types of wines are distinguished: top wines, quality wines and table wines.

Table: Relation between quality of grapes and the area lost in Rahovec

Wine grape quality	Area in 2002	Area in 2008	% remained
Top wines: Chardonnay, Semion, Sauvigon, Muscat Ottonel, Rhein Riesling, Pinot Blanc, Pinot Noir, Merlot, Cabernet S.	186 ha	133 ha	71%
Quality wines: Italian Riesling, Zhillavka, Coloured Gamay, Gamay, Vranac, Frankovka, Alicante,	915 ha	743 ha	81%
Table wines: Smederevka, Rakaciteli, Zhupljanka, Procupak and Zhametna	935 ha	649 ha	69%

The variety structure represents the old strategy of producing bulk wines. The losses are fairly similar in all categories, except for the second quality which includes Vranac. This means that the area under first quality grapes in Rahovec slightly decreased from 8.9% in 2002 to 8.4% in 2008.

The next table shows the same data on table grapes.

Table: Area under different table grape varieties in 2002 and 2008

	Area in 2002	Area in Rahovec in 2002	Area in Rahovec in 2008	% of 2008 remained
Afuzali	177	66	30	46
Muscat Italian	169	129	137	106
Muscat Hamburg	174	111	139	125
Kardinal	92	37	27	72
Grocanka	52	25	1	4
Others	10	26	32	123
TOTAL	**674**	**394**	**366**	**93**

A much higher percentage of table grapes has been retained since 2002. Assuming that the area developed in the same way outside Rahovec, the total area under table gapes is 625 ha. Adding the 300 ha of Vranac the area under table grapes comes to 925 ha.

5.1.5 Types of farmers

In the ARDP and in other documents, wine farmers are divided in three groups:

- Traditional vineyards with up to 0.20 ha; majority for home consumption;
- Semi-commercial vineyards from 0.20 ha up to 1 ha; and
- Commercial vineyards with over 1.0 ha.

In 2008, the EVV commissioned an inventory of all vineyards in Rahovec. It will serve as a base for a cadastral registration of all vineyards and for a future wine atlas. The next table with data from this inventory shows the size distribution of parcels in Rahovec. The 1,969 ha are owned by 3,343 farmers who have 4,057 vineyards in 5,848 parcels.

Table : Parcel size distribution in Rahovec in 2008

Parcel size category	Number	Est. average	Total area
0.05 – 0.5 ha	3,028	0.25	757
0.5 - 1 ha	686	0.75	515
1- 1.5 ha	136	1.25	170
1.5 -2 ha	62	1.75	109
2 – 2.5 ha	45	2.25	101
2.5-3 ha	33	2.75	91
> 3 ha	67	3.39	227
Total	**4,057**	**0.49**	**1,969**

The table shows an extreme fragmentation of vineyards. The overall average is half a hectare. With an average yield of 8 t/ha, the average farmer has 4 t.

In this strategy, two main types of vineyards are distinguished: those owned by farmers and those owned by wineries. The latter refers basically to two large companies *Stonecastele vineyards & Winery L.I.C* and *Agrokosova Holding.* Each owned some 600 ha of vineyards each in 2006. Since then they abandoned about 20%, so presently they have 970 ha. Their yields have been very low, but as the worst parts are left aside, it starts to increase. In 2007 it was over 5 t/ha.

Producers are not (yet) organised in associations. There is only one vineyard cooperative (in Rahovec) with members from Albanian and Serbian communities. The main aim is to

exchange information and experiences and to identify market opportunities. The coop is not directly involved in economic activities.

5.1.6 Crop husbandry

Since the 1970'ies grape production was dominated by vineyards with a support system (trellis), despite some areas where cultivation is done by the classic method (in stumps) with autochthon varieties such as *Prokupka* dhe *Pllovdina.* Nowadays vineyards are planted with a support system to enable the use of more modern agricultural machinery.

Essential inputs in vineyards and wineries are mainly imported: fertilizers, pesticides, concrete columns, wire and biotechnological substances for wine production. Traders import through authorised representatives in Kosovo, such as Agrounion, Semenarna etc. Distribution is done through smaller traders and agricultural pharmacies in vineyard areas. Relations among traders and farmers are good, but there are cases when there is a lack of adequate professional advice. Suppliers conduct market research for new inputs, whilst the promotion of new products is done through fairs and various presentations.

The timing and N application is not always optimal. Instead of applying these early on in the growing season, some farmers incorrectly apply nitrogen as late as August, i.e. at the end of the growth period. With no subsequent effect on the grapes it is subsequently lost as a pollutant in runoff to the local stream and river systems.

5.1.7 Nurseries and seedlings

Quality seedlings are crucial for good production. There are 11 nurseries with a capacity of 110.000 - 145.000 seedlings. Nearly all are in Rahovec; one is in Suhereka. None of them is able to apply quality standards. The main constraints are:

- The use of mother-materials from not certified sources ('normal' vineyard). Next to problems with disease, some materials are not true to type.
- Old fashioned grafting technology, a lack of a proper (clean) working environment and proper stores
- No proper inspection and certification.
- Poor labelling, classification, marketing etc.
- Lack of training and advice.

In 2007 another 283.000 seedlings were imported, mostly from Serbia. Comparing the percentages of imported varieties with those of existing varieties, leads to the following observations:

- 30% of imported seedlings is Vranac, which covers only 5% of existing orchards. Although it can be classified as a second quality wine grape, it is a table grape as well. Classifying it as table grape brings the share of table grapes to over 50% of imported seedlings, a clear indication of the farmers' preference for this crop
- The share of Smederevka and Prokupk drops dramatically. These are third class wines. The same can be said about Gamay, a second quality wine. Another explanation could be that these seedlings are produced inside Kosovo.
- Some first quality wines get a higher share than they have at present (Merlot, Chardonnay, Cabernet Sauvignon) while another gets less: Pino Noir. Probably the latter is also produced inside Kosovo.
- 60.000 seedlings of first quality grapes are imported, enough to plant 15 ha.

Seedlings of grape-vine are imported by authorised traders. Seedlings often do not meet the required standards and they are generally not certified.

So in 2007 some 400.000 seedlings were used, sufficient to plant 100 ha. In 2008 Stone Castle commissioned the establishment of 50 ha of wine grapes by a foreign company who will bring their own seedlings.

The inventory in Rahovec showed that the bulk of vineyards (63%) are over 20 years old, and 20% is over 30 years.

The EVV developed a project proposal for a nursery of 10 ha. For rootstocks production the investments is 10.500 Euro/ha and for budwood 13.200 Euro/ha (both without labour costs). One ha can yield 75.000 rootstocks of 8 cts each; so the income is 6.000 Euro/ha. As the direct production costs are 1.200 Euro, the profit is 4.800/ha. For budwood the yield is 400.000 buds/ha. With 3 cts each, this yields 12.000 Euro/ha. With the direct costs being 1.300 Euro, the profit is 10.700 Euro/ha. The estimates concerning budwood seem very optimistic (probably the labour costs are insufficiently taken into account); still the general trend is that investments in nurseries are equally profitable as other investments. The main constraint is that it requires more specialised knowledge and skills.

5.1.8 Plant protection

Diseases of economic importance that affect the grape-vine are:

Plasmopara viticola is one of the most dangerous diseases of grape-vines. As a result of the lack of protective measures, the pathogen causes losses, of 50 - 80 % of the yield.

Uncinula necator. Depending on climatic conditions, the damage from this pathogen may go up to 80 %. To fight it successfully, dinocap and sulphur-based preparations (mixtures) may be used. In the recent years, fungicides with systemic reaction are also being used.

Guignardia bidwellii is present in all regions where grape is cultivated. The fungus that causes the disease is treated before and after the blooming of grape-vine.

The most dangerous pests is:

Pulvinaria vitis
The pathogen is very dangerous; it blocks the normal growth of grapevine also by having an impact in decreasing the quantity and the quality of production.

The MSP report found clear indications that farmers need practical advice in the selection, timing and correct application rates of pesticides. Farmers are applying excessive amounts of fungicide and insecticide, often incorrectly diagnosing the disease and then subsequently using the wrong type of treatment.

5.1.9 Yields

According to the ARDP in 2004 the average yield was 6.7 t/ha. The yield on family farms was higher (8.3 t/ha) than of privatised large scale SOE (3.5 t/ha). In 2007 the EEV estimated the average yield as 7.3 t/ ha. This was particularly due to improvement on large scale farms where yields increased substantially (to over 5 t/ha).

In all circumstances, higher yields are achieved by fresh table grape varieties than by wine production varieties.

5.1.10 Harvesting and post harvest issue

Some processors make contracts with farmers, specifying the conditions that have to be respected by both sides, as well as the price and the time of payment. To decide on the beginning of the vintage the amount of sugar and acids in the grape juice is determined by the EVV, which issues permits to begin the vintage depending on the variety. Samples to analyse sugar (min. 16%), acids and alcohol are taken in 11 vineyards. In 2007, 36 samples were taken; the costs were covered by MAFRD. Large processing companies do they same, as they inform their clients on the time of harvesting.

Vintage is done manually. Wine grapes are usually delivered in wooden boxes; this adds 2 cts per kg to the price. Recently plastic cases are used during storage and transport of grapes, to preserve quality. Packing material should contain data on the producer, variety, quality and weight. In Kosovo no company is specialised on packing and grading of grape. Some processors started to invest in better labels on the wine bottles.

5.1.11 Quality, grading and sorting

Kosovo table grapes are of good quality. The quality is determined by the percentages of sugar and acids, aroma, shape, size and colour. Some wine grapes are sold as table grape; especially Vranac but some other varieties as well.

Determinants of the quality of wine grape are: variety, amount of sugar and acids, cleanliness and purity of variety. The quality of wine is determined by a physical-chemical analysis and organoleptic methods. In the physical-chemical analysis volatile acids are taken into account, as well as free and tied sulphur, ph, alcohol, sugar, specific weight etc. The organoleptic evaluation relies on parameters as: colour, purity, aroma and taste. Based on chemical and organoleptic parameters wine is divided into Table wines, Quality wines and Top wines. In par. 5.1.3 one can see which varieties belong to each group.

5.1.12 Processing

The huge wine processing capacity of Kosovo is still under reconstruction. At the moment, there are two types of companies involved:

<u>Grape production and processing companies</u>

1. “Stone Castle Vineyards- Winery” – Rahovec
2. SHPK “ Biopak” – Rahovec
3. SHPK “ Rahoveci”- Rahovec
4. NTP “ Muja” – Rahovec
5. SH.A. “Agrokosova Holding” – Suhareka.

<u>Private companies that process grape into wine are:</u>

6. NTP “Haxhijaha”- Rahovec
7. NTP “Dea” – Gjakova
8. NSH “ Kosovavera”- Krusha e Vogël.
9. NTP “ Ereniku”- Gjakova.

The ex-SOE NBI ”Rahoveci” is the dominant player. After its privatisation, it was divided in 2 private companies: “Stone Castle Vineyards and Winery“ and the “Old Cellar”. Both have a processing capacity of 50 million litres of wine p.a.. Important investments are made by “Stone Castle” which started a modern filling-line that guarantees the highest quality products. Also, the NPT “Haxhijaha” has made a significant investment in fermenting vessels which are digital and they enable controlled fermentation.

In Suhareka, the NBI "Suhareka" has been privatised and is now called "Agrokosova Holding" a shareholding company with domestic capital of "QMI" and foreign capital of "Fantinelli" from Italy. No changes were noticed since the privatisation. "Kosovavera" in Krusha e Vogël is in a difficult position as the owner is not yet known.

The amount of wine produced has been reduced substantially over the last few years. In 2005 the main types of wine produced were:

- Red wines: e.g. Pinot Noir, Vranac and Gamay. Total production was 5.9 million litres (63%) with producer prices ranging from 1.30 to 2.50 euro/litre.
- White wine: e.g. Italian Riesling. Total production was 3.4 million litres (37%) with producer price ranging from 1.30 to 2.00 euro/litre.

One litre of wines requires 1.55 kg of grapes. So 14.400 t of grapes was transformed into wine; a small increase over the 13.137 t delivered to wineries in 2004 (ARDP data). In 2006 and 2007 however only 5.6 million litres of wine was made. The next table shows who produced this in 2007.

Table: Wine production by the major wineries in 2007

Company	Production	Grapes used (t)	%
Stone Castle	4,896,274	7,589	87
Haxhijaha	598,000	927	11
Biopak	102,000	158	2
Dea	44,000	68	1
Rahoveci	474	1	0
Total	**5,640,757**	**8,743**	**100**

The amount of grapes used (8.743 t) is one third less than in 2005. Of this, 6.670 t was bought by wineries from farmers. The next table shows how much grapes were used to produce quality wines in 2006 and 2007. It also gives the amount of wine produced.

Table: First quality wine in 2006 and 2007

	2006		2007		Diff.
	Grapes (kg)	**Wine (l.)**	**Grapes (kg)**	**Wine (l.)**	
Top quality	1,162,500	750,000	228,870	147,658	- 80%
First quality	1,709,340	1,102,800	852,038	549,702	- 50%
% of kulminant		**68**		**27**	

Source: Data collected by EVV

The amount of quality wine dropped dramatically in 2007. The next table gives more details on which varieties were used to produce quality wines.

Table: The amount of top quality grapes processed in 2007 (kg)

Company	Caber-net	Pino Noir	Pino Blanc	Merlot	Shar-donnay	Riesling	Total
Stone Castle	670	310,280	7,310	17,240	7,720	315,290	658,510
Haxhijaha	28,450	21,315	0	35,340	0	5,155	90,260
Biopak	7,820	0	0	4,569	7,500	0	19,889
DEA	0	13,810	0	0	0	0	13,810
Rahoveci sh.p.k.	2,415	3,897	0	1,016	0	0	7,328
NPT "MUJA"	9,658	10,729	0	0	0	0	20,387
TOTAL	**49,013**	**360,031**	**7,310**	**58,165**	**15,220**	**320,445**	**810,184**
Percentage	6	44	1	7	2	40	

Source: EVV data

In the next table the amount of wine that can be processed with these quantities is shown.

Table: The amount of quality wines produced per company

Company	Grapes used	Litres of wine	%
Stone Castle	658,510	424,845	81
Haxhijaha	90,260	58,232	11
Biopak	19,889	12,832	2
DEA	13,810	8,910	2
Rahoveci sh.p.k.	7,328	4,728	1
NPT "MUJA"	20,387	13,153	3
TOTAL	**810,184**	**522,699**	**100**

Source: EVV data

Half a million litres of top quality wine is made, primarily by two companies that invested in processing facilities. The 810 t of grapes needed for this can be produced on 100 ha; if the amount processed is divided by the area under top grape wines in Rahovec alone (133 ha), the av. yields has been 5 t/ha. As there will be top wines in Suhareka as well, this suggests not all top quality grapes are processed into top quality wine.

Home processing of grape into wine and grape brandy (rakia) is important as well. There are a relatively large number of processors which are not licensed and the conditions under which they conduct processing are very poor, both in terms of hygiene as well as in terms of technological equipment.

5.1.13 Marketing

Market size

Since the area in production was reduced substantially in the last years and no reliable data on yields available, the best way to assess the local market for wine is based on data of wineries and import/export. Recent EVV data show that in early 2006 there were 17 million litres of wine in reserves. In 2006 and 2007 the wineries produced 11.3 million litres. Export was 8.1 million (3.1 and 5 million in resp. 2006 and 2007) and imports 1 million. In early 2008 the reserves were 10 million litres. So local consumption of formally processed wine in the two years has been 11.2 million litres or 2.8 litres/capita p.a.. The Working Group estimated that half of this is processed at home. This brings the total to 4.2 litres/cap/year. One needs 6.3 kg of grape wines for this.

The only data on table grape consumption are from the ARDP, where production is estimated at 8.010 t and imports at 3.688 t. With export being neglectable, this brings the total local market demand at 5.8 kg/capita. On top of all insecurity, wine grapes are sold as table grapes. To compensate this, the annual consumption is put at 6 kg/cap, both for table- and wine grapes. With 2 million people this lead to a total grape production of 24.000 t. With the total area under grapes at 2.900 ha, average yields are 8.3 t/ha.

The next table puts the Kosovo data in a regional perspective.

Table: Wine and grape consumption (l/cap and kg/cap) in the region in 2003

Country	Wine	Grapes	Total
Albania	3	31	34
Bosnia and Herzegovina	1	3	4
Bulgaria	3	13	16
Croatia	40	18	58
Hungary	33	2	35
Romania	22	5	27
Serbia / Montenegro	8	21	29
FYR of Macedonia	18	26	44
AVERAGE	**16**	**15**	**31**
Kosovo	*6*	*6*	*12*

Source: Website of FAO stat.

Consumption of both table grapes and wine in Kosovo is low. The table shows huge differences between countries and in the ratio of grapes/wine; part of this is probably due to different definitions used in statistics. Partly this will be the result of the 'wine culture' in the countries. Kosovo does not have a real wine culture.

Market channels

Table grapes produced by large companies are contracted in advance to large-scale traders who distribute them to retailers. Small farmers sell their table grape at their farm-gates, or on nearby markets or on temporary outlets close to national roads. The greatest markets are in Prishtina, Prizren, Gjakova, Peja and Gjilan. The most common complaints from buyers on these markets are the price and packaging (equally important) and quality.

The MSP survey in 2006[21] found that 76% of the wine producers sold their wine bottled and the remainder (24%) in bulk. Of the wine sold in bottles, 64% was in 75cl bottles and 31% in 1 litre bottles. Producers sold 79% of their wine locally and exported 21%. The vast majority of the exported wine relates to one export contract with a former SOE for bulk wine to Germany (at a very low price).

On the local market, 64% of the wine produced was sold to wholesalers and 36% of wine was sold retail mainly to supermarkets (55%) & restaurants (21%). The main enterprises supplied by the wine producers were: BenAf, Elkos, Era, Interex and Racke.

Of the wholesalers surveyed, 38% purchased direct from local wine producers, 35% from other traders in the supply chain and 27% was imported. The main reasons for obtaining supplies from abroad were: quality, consistency of supply, packaging and price. Retailers surveyed purchased 65% from producers and 35% from wholesalers.

Market prices

The price of table grapes depends on the variety and quality. The average farm gate price is estimated to be 0.5 Euro/kg. Wholesale prices for 2005-2007 collected by HPK show an average price of 60-70 cts/kg during the harvest season (august-nov.). The two large companies sell their table grapes for 41-45 cents/kg. Some of this is said to be exported to Macedonia.

For wine grapes there was a fixed price for all grapes until 2006: 27 cents/kg. Since then prices have been differentiated; depending on cultivar and quality. The price of grapes for

[21] Anonymous, 2006. Marketing Feasibility Study Wine & Grape Sector (MSP project)

top wines is 50 cts/kg; for quality wines 35 cts/kg and for table wines 20 cts/kg. As 2007 was a year of a great drought, an additional 3 cts/kg was paid.

5.1.14 Imports and export

Fresh grapes

Imports
In 2005, Kosovo imported 3.688 t of table grape, in 2006 and 2007 it was around 2,000 t. In 2007 it had a declared value of €831,417 (av. price 38 cts/kg.). Seventy eight percent was from Greece and Macedonia. Fresh table grape is imported throughout the year, but most (90%) in July – October when there is local production as well. Imported grapes are well sorted, packed properly in carton boxes.

Exports
In 2007 258 t of table grape was exported with a declared value of €29,639. The main destination is Montenegro (99.5%). MAFRD believes that there may be illegal export to Albania and Montenegro. Virtually all export took place in September and October.

Wine grapes
The international wine market is complicated and dynamic. Tastes are changing and in the last decades many countries tried to enter the lucrative markets of Western Europe, but there consumption was shrinking. Some countries managed to capture a market share, others failed. The main trend was a 10% reduction in the area under grapes in the EU (after a reduction of 15% in the 1980's), a 20% reduction in the area in Europe outside the EU and a 10% growth in the rest of the world. In short: a substantial shift in production from traditional producers like France and Portugal to countries like Chili and the USA. Several countries in South East Europe experienced a dramatic reduction in both the area under grapes and wine production (e.g. Montenegro, Serbia, Moldova); other have been rather stable (Slovenia) while some are recovering from their initial set-back and increase production (Croatia, Macedonia and Albania).

Kosovo is a net wine exporter, however quality it a major problem. In 2006 it exported 3.1 million litres, in 2007 over 5 million litres and in the first half of 2008 again 3 million litres[22]. In 2007, the main buyers were Serbia (57%) and Germany (35%). The price is very low: 40-50 cts/litre. Export earnings are in the range of 2 million Euro. The export comes from large reserves of Stone Castle (45%), Kosova Vera (41%) and Agro Kosova (11). Their reserves are still enormous: 10 million litres in early 2008.

Next to this, there is a very small flow of export of quality wine: 852 bottles of 0.75 litre; half were sold to Germany for 3 Euro per bottle and half to Albania for 1 Euro/bottle. The international market focuses on Kosovar in diaspora. The first owner of Stone Castle was oriented to this market in the USA. Yet, he sold the company later.

Wine import wine came down from 0.7 million litres in 2005 to 0.3 million litres in 2007. Imports come from 20 countries; the main sources are Montenegro (62%), Italy (11%) and Macedonia (10%). The import is dominated by top (white and red) wines. Imported wine is bottled and its value is 1,7 million Euro (av. price in 2007 was €2,15/litre, before taxes). Stakeholders estimate that actual imports are higher as the presented quantity does not match with the actual situation in the Kosovo market. There might be unauthorised wine imports or technical errors during the processing of data from the Customs.

[22] All data here are from the EVV

5.1.15 Policy environment

The government has a keen interest in the wine industry. It passed a Wine Law that governs wine production at a high standard which is considered as one of the finest in the world for a small growing region such as Kosovo. The creation, in 2007, of the Wine Institute in Rahovec (EVV) which will lead the change towards quality and technology-based wine-making techniques is also an important step towards the revitalisation and modernisation of the wine industry.

The high priority of grapes for MAFRD is also reflected in the donor conference for Kosovo held in Brussels in mid-2008. MAFRD presented there a project proposal (made by EVV) to create 1.500 ha of grapes: 300 ha for table grapes and 1.200 for wine grapes.

5.2 Potential growth

5.2.1 Increased productivity

The income that farmers can get from grapes production is presented in the next table:

Table: Economic analysis of different viticulture's

	Yield (kg.ha)	Price (Euro/kg)	Gross income (Euro/ha)	Fix costs (Euro/ha)	Var. Costs (Euro/ha)	Family Labour (Euro/ha)	Income from land and capital (Euro/ha)	Income from land, capital and labour (Euro/ha)
	(a)	(b)	c = a x b	(d)	(e)	(f)	(c-d-e)	(c-d-e+f)
Table grapes								
Current practice	9,500	0.50	4,750	700	1,642	880	2,408	3,288
Best practice	11,000	0.50	5,500	700	1,852	1,090	2,948	4,038
Vineyards								
Actual vineyards	7,200	0.30	2,160	700	1,410	730	50	780
First class	9,500	0.50	4,750	700	1,410	730	2,640	3,370
Second	10,500	0.30	3,150	700	1,410	730	1,040	1,770
Third	12,000	0.20	2,400	700	1,410	730	290	1,020

Source: calculations of the WG.

Table grapes are most attractive; it requires some more labour and the income from land and capital is (much) higher. In vineyards, profits are much smaller and depends much on the quality. For both grapes intensifying production does not only lead to higher yields and income per ha, it also reduces the cost price per kg. For tables grapes from 25 to 23 cents and for wine grapes from 29 to 18-22 cents/kg (depending on the quality).

5.2.2 Potential market growth

The potential to grow depends on four issues:
a. Growth of consumption due to population growth and higher consumption per cap.
b. Replacement of small, subsistence farms
c. Import substitution
d. Export potential

It is very complicated to develop scenario's for table grapes, as long as wine grapes are also sold as table grapes. So the data used here are only very rough estimates.

Table grapes

Consumption
The population is assumed to grow with 2% p.a. and so is the consumption per capita. So total consumption will increase with some 2.500 t by 2013.

Replacement of small farmers
As we have seen that the area under table grapes has hardly been reduced in the last few years, it is assumed that the area of 925 ha will remain constant. The yield is supposed to grow very slowly with 1%.

Import substitution
Currently the import is about 2.000 t. It is assumed to remain constant.

Export
The export is small, but it is assumed to grow with 10% per year.

With these few data the scenario shown on the next page is made. It shows that until 2013 there is a shortage of some 2.000 tonnes. This will partly be compensated by surplus wine grapes that are sold as table grapes (see below) and partly by more imports. After 2013, the deficit is reduced rapidly as new vineyards come into production. By 2018, production and consumption are in balance, with still some import and exports.

All in all, the scenario shows there is room for 150 ha of new table grape orchards per year in the period 2009 – 2013; or 750 ha in five years. Next to this annually, some 20 ha of old vineyards have to be renewed.

With 4.000 seedlings per ha, annually 720.000 seedlings are needed; far more than the amount produced locally at the moment. After 2013, however the need for seedlings will be reduced considerably.

Wine grapes
Consumption
Consumption is estimated to be 6 kg/cap.. A specific problem is the role of foreigners who are estimated to consume 20% of all wine. If most of them leave Kosovo in the next 5 years, the Kosovar have to increase their consumption with 4% per year to maintain present consumption levels. So it was decided to keep consumption per cap. constant; as the population is supposed to grow by 2% p.a. total consumption increases with some 2.000 t between 2008 and 2013.

Abandoned vineyards
In line with the trend in the last years, the area of vineyards is supposed to be reduced by 4% per year; until another 20% is lost in 2013. After that, it is supposed to remain constant. Yields are assumed to increase by 2% per year, as poorer performing vineyards are abandoned.

Import and export
Imports are limited to less than 10% of local consumption. It consists mostly of quality wines. It is assumed that this will remain stable.

Export is taking place, however the question is: is export profitable? Selling wines for 40 - 50 cts/litres is not profitable. The costs price of bulk wine is at least 0.7 Euro per litre. So

when present reserves have been finished this export will cease. The next question is: can Kosovo export quality wines? Are Kosova wines good enough to compete on a very competitive international market? As no international competitive study is available, we have to work with the few data at hand.

The cost price of wine grapes ranges from 15 to 24 cts/kg. In Moldova the average cost price is 12 cts/kg. EVV-data show that the cost price of top quality wines is 2.2 Euro/litre, excluding labour cost. Grapes constitute 40% of the costs, and the bottle (incl. etiket, cork etc.) 35%. One way to reduce the costs for wineries is to grow their own grapes; Stone Castle commissioned the establishment of a 50 ha vineyard to an international company.

Whether a cost-price of 1.8 Euro per bottle of 750 ml., makes Kosovo wines competitive on international markets remains to be seen. Studies into the competitiveness of the two major companies that invested in processing have to prove this. Whether the government should support them has to depend on the outcome of such studies.

Supporting farmers to increase wine grape production is difficult to justify as for the next few years Kosovo will struggle with over-production. The present 2000 ha is capable of satisfying the local demand. To export the over-production against prices below costs prices by the privatised ex-SOE's can not be sustained.

In the scenario on wine grapes (see table on page 59) these data lead to an initial surplus of 2.500 tonnes. This can be resolved by farmers selling wine grapes as table grapes. The surplus is rapidly coming down and would turn into a deficit in 2013, if nothing is done. Planting 50 ha in 2009 counterbalances this and leads to a rather steady small surplus between 2013 and 2018 of about 200 tonnes.

The conclusion is that planting any more new vineyards in 2009 or later, above the 50 ha planned by Stone Castle, will require substantial exports of quality wines in the future. At the moment, there is no indication that this is feasible. So before MAFRD could support or stimulate the creation of new vineyards, there should be more insights in the chances of Kosovo wines on the international market of top wines.

This confirms the conclusion of the ARDP: *Concerning wine production, the domestic market is very small, with a low consumption rate compared to other countries. The ability to export will therefore determine whether this sector will expand or contract.*

Table: scenario for the development of the area under table grapes

	Annual growth	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total table grape consumption												
Population (million)	2%	2.06	2.10	2.14	2.19	2.23	2.27	2.32	2.37	2.41	2.46	2.51
Consumption (Kg/cap.)	2%	6.0	6.1	6.2	6.4	6.5	6.6	6.8	6.9	7.0	7.2	7.3
Total grape consumption(t)		12,360	12,859	13,379	13,919	14,482	15,067	15,675	16,309	16,968	17,653	18,366
Production in existing vineyards												
Area under table grapes	0%	925	925	925	925	925	925	925	925	925	925	925
Yield (t/ha)	1%	9.5	9.6	9.7	9.8	9.9	10.0	10.1	10.2	10.3	10.4	10.5
Total production (t)		8,788	8,875	8,964	9,054	9,144	9,236	9,328	9,421	9,516	9,611	9,707
Production in (new) vineyards												
Newly planted (ha)		0	**150**	**150**	**150**	**150**	**150**	0	0	0	0	0
Total production new orchards (t)	10.0	0	0	0	525	1,425	2,625	4,125	5,625	6,600	7,200	7,500
Total local production table grapes		8,788	8,875	8,964	9,579	10,569	11,861	13,453	15,046	16,116	16,811	17,207
Import	0%	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Export	10%	250	275	303	333	366	403	443	487	536	589	648
Production minus consumption		-1,823	-2,259	-2,717	-2,673	-2,278	-1,609	-665	250	612	568	192
Replacement of old vineyards		0	19	19	19	19	19	19	19	19	19	19
Total to be planted			169	169	144	144	144	19	19	19	19	19

Table: scenario for the development of the area under wine grapes

	Annual growth	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total table grape consumption Population (million)	2%	2.06	2.10	2.14	2.19	2.23	2.27	2.32	2.37	2.41	2.46	2.51
Consumption (Kg/cap.)	0%	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Total wine grape consumption(t)		12,360	12,607	12,859	13,117	13,379	13,646	13,919	14,198	14,482	14,771	15,067
Production in existing vineyards												
Area under wine grapes	-4%	2,000	1,920	1,843	1,769	1,699	1,631	1,631	1,631	1,631	1,631	1,631
Yield (t/ha)	2%	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.3	8.4	8.6	8.8
Total production (t)		14,400	14,100	13,807	13,520	13,239	12,963	13,223	13,487	13,757	14,032	14,313
Production in (new) vineyards												
Newly planted (ha)		0	50	0	0	0	0	0	0	0	0	0
Total production new orchards (t)	10.0	0	0	0	175	300	400	500	500	500	500	500
Total local production wine grapes		14,400	14,100	13,807	13,695	13,539	13,363	13,723	13,987	14,257	14,532	14,813
Import	0%	465	465	465	465	465	465	465	465	465	465	465
Production minus consumption		2,505	1,958	1,413	1,043	625	182	268	254	240	226	211
Replacement of old vineyards			38	37	35	34	33	33	33	33	33	33
Total to be planted			88	37	35	34	33	33	33	33	33	33

5.3 Support needed

In order to become a competitive and healthy sub-sector, farmers and processors need support. The strategic aim of this support for table grapes is to reduce the import and prepare for a limited amount if export. For wine grapes the principle aim is to reduce the present reserves and over-production of poor quality wines and to become self-sufficient for all but exclusive wines.

To convince farmers to grow more wine grapes will be difficult, as long as they can get a higher income from table grapes. Probably the best way to stimulate wine production is that wineries invest in their own production. Once they created a critical mass of quality wines and an export market with their own production, an outgrower scheme could be effective in attracting additional production from medium size farmers.

5.3.1 Access to inputs and technologies

Quality seedlings are needed, these are not produced in Kosovo and also imports are of low quality. Both local nurseries and imports need to be subjected to very strict inspections. The long term aim should be to achieve EU-standards in the area of disease control, control of purity of varieties and respecting breeder's rights.

The EVV developed a project proposal to create a 10 ha nursery, but no funding has been found as yet. The crucial question is who will own and manage these nurseries and how much will they need to co-invest. Another way of getting better quality seedlings would be to use the method proposed for fruits: a 1:1 matching scheme for high quality seedlings.

In the production process, more attention should be paid to a proper use of pesticides; guideline for IP should be developed (thresholds; lists of appropriate pesticides, proper spraying equipment etc.).

5.3.2 Access to markets

Table grapes
At the moment farmers do not face any marketing problem, yet they can get better prices if the grade the produce better, use better packing materials and more attractive labels.

Wine grapes
The present market is characterised by low quality wines for a low price as formally produced wines compete with home made wines. To maintain reasonable returns to the investments in the sub-sector, better quality is needed and a clear profile of the marketed wine vis-à-vis home made wines. The first step is to plant only varieties for top wines. The EVV recommends the following:

Varietetet e propozuara për mbeshtetje:

Varietetet e zeza	Varietetet e bardha	Varietetet për tryezë
Merlot	Chardonnay	Muscat Italian
Cabernet Sauvignon	Riesling Rajne	Muscat hamburg
Pino Noir	Pino Blanc	Kardinal
Cabernet Franc	Semion	Demir kapi
	Traminer	Afusali

Secondly the quality of the processing has to be improved; and the bottling, labelling and packing. The large companies have already invested substantially in this.

Thirdly, EVV and others have to work on creating a wine culture in Kosovo. This is a long term process. People are more oriented to drinking rakia (the older generation) and beer (the younger generation), rather than wine. People have to learn to appreciate a good wine. Fairs, exhibitions, a national wine festival, competitions, taste contests, training, publicity etc. are all needed.

To allow for a proper labelling of top wines a certification system is needed. EVV has a 3-year project to create a Wine Atlas, indicating where different varieties can be grown best. The inventory of Rahovec was completed at the end of 2008. This will form the foundation of a future GIS-based certification system.

5.3.3 Access to finance

Establishing new vineyards requires 12.300 Euro/ha. This excludes costs for labour and some small items. The total costs are estimated at 14.000 Euro/ha; both for table- and wine grapes. The main costs are the (4000) seedlings, the concrete posts and other parts of the support system. In total, this reaches some 10.000 Euro.

No multi-annual cash flow projections of vineyards are available, but with the above information a very simple one can be constructed. Annual running costs are 1.400 Euro/ha and the maximum yield 10 t (after 6 yrs) is sold for 0,5 Euro/kg. The next table provides the cash flow of a semi-intensive vineyard, based on these data and on the assumption that the farmer invests all labour. Cash investments are 13.000 Euro and the farmer takes a loan of 10.000, with a grace period of 2 years.

Table: Cash flow for one ha of grapes

	1	2	3	4	5	6	7	8	9
Income		0	1,700	3,000	4,000	5,000	5,000	5,000	5,000
Costs	13,000	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400
Annual cash flow	(13,000)	(1,400)	300	1,600	2,600	3,600	3,600	3,600	3,600
Cumulative cash flow	(13,000)	(14,400)	(14,100)	(12,500)	(9,900)	(6,300)	(2,700)	900	4,500

Even is this rather optimistic scenario (without discounting future incomes) the break even point is reached only after 8 years. With the loan the cash flow is less negative, yet it takes more then 10 years to arrive at the break-even point. As during these years a farmer also has to use part of the income for family needs, it is clear that investing in vineyards is not attractive for small farmers. The following table shows the impact of two ways of supporting farmers financially:

a. subsidising the interest rate (of 14%)
b. provide a grant of 3.500 Euro/ha.

Table: impact subsidy of interest of a loan of 10.000 Euro for a vineyard

	1	2	3	4	5	6	7	8	9
Cumulative cash flow without subsidy	(13,000)	(14,400)	(14,100)	(12,500)	(9,900)	(6,300)	(2,700)	900	4,500
Cumulative cash flow with subsidy on interest rate (total subsidy in 5 years 4.750)	(3,000)	(4,400)	(5,649)	(6,660)	(7,060)	(6,300)	(2,700)	900	4,500
Cumulative cash flow with 3.500 cash subsidy at once (discounted total costs also 4.750)	(3,000)	(5,430)	(7,006)	(7,766)	(7,526)	(5,892)	(2,292)	1,308	4,908

Subsidising the interest rate reduces the max. negative cash flow with more than 7.000 Euro. The cost of subsidising the interest rate is 4.750 Euro over 5 years. If this is discounted at 10%, the present value is 3.500 Euro. If this 3.500 Euro is provided as a cash grant, the cash flow is initially more negative, but is slightly better after 5 years.

Until 2013, 800 ha of table grape vineyards can be planted. If MAFRD contributes 3.500 Euro/ha, it needs an annual budget of 700.000 Euro. For 100 ha of wine grapes annually 350.000 Euro is needed.

In practice wineries plant new orchards. They can not only mobilise more capital, they can also reduce the cost price of their wine. The cost price of the grapes is half the price for which they have to buy them from farmers. On top of that, it can provide them with the right (mix of) varieties and with the right quality.

The WG proposed to support farmer with 0.5 – 3 ha of vineyards, yet the question is whether the government should assist small farmers financially to plant quality vineyards or that this can be left to processing companies. Eventually the government could support processors as well; either with direct subsidies or with support in export promotion, training and extension, quality control systems etc.

5.3.4 Access to knowledge and skills

Grapes production requires a good a lot of knowledge and skills on issues like fertilisation, pruning and thinning and pest management. The latter has not yet received sufficient attention since the war and needs to be taken up.

An early warning system for diseases and pests in vineyards seems a very efficient way to advise farmers on the optimal timing of plant protecting. It is recommended that the protection system remains under the responsibility of the EVV. Secondly, a green and yellow list of registered pesticides has to be compiled for the main problems in grapes.

5.3.5 Policies and regulations

The most important task of the government is to ensure that healthy seedlings are used.

The role of the EVV needs further clarification. Options to expand its mandate are: set up an early warning system for pests and diseases, publish practical book(let)s and export promotion.

The co-financing of the institute by private actors needs to be discussed. The easiest way is to have clients (increasingly) pay for licences or a levy on exports. In return, the private sector could get a bigger say in the board of the EVV.

6 Ornamental production

6.1 Production system

6.1.1 Introduction

In the 1980's, annual and perennial ornamental trees, shrubs and flowers were produced by companies in the social sector who owned their own outlets, maintained public parks and exchanged products with other companies. In Kosovo, only in Koretin village (Kamenica) there were private producers of ornamentals, mainly thuya and roses.

Commercial production of seasonal ornamentals started immediately after the war in small unheated polyethylene greenhouses by producers of vegetable seedlings. Poor technologies were used– e.g. low quality seeds. Later seedlings were imported from Serbia. In the last few years the sector developed tremendously as both demand and supply increased. The diaspora had an impact as well, as people working in western countries understood the importance and profitability of this activity.

There is huge interest of farmers in ornamental plants so there is a quick increase in the area of both open field and greenhouses. Ornamentals are now being grown in Ferizaj, Shtime, Lipjan, Pristine, Gjilan, Suhareka and Kamenica. Currently 14 producers of ornamentals are registered and licensed in compliance with the Law on Planting Material and its Administrative instructions. The total number of producers is about twice as high.

Ornamentals are divided into annual- and perennial ornamentals. Annual ornamentals are plants which begin and finish their biological cycle within one year i.e. come up in spring and finish flowering, respectively setting seeds by the end of the year. All are reproduced by seeds, e.g. Begonia Semperflorens, Petunia, Tagetes, Ageratum, Salvia Splendens etc. Most are grown in greenhouses.

Perennials are plants whose biological cycle lasts two or more years. In some of them the vegetative part dries out by the end of the years, while their root-stock remains active. Some others are evergreen plants during the year. This group consists of:

a. perennial flowers
b. shrubs;
c. ornamental trees which are divided into deciduous trees and evergreen trees

6.1.2 Types of farmers

In terms of types of farmers, two different types of farmers can be distinguished:

Producers of annual ornamentals in greenhouses
They mainly deal with flower growing. In some cases they combine this with vegetable growing in greenhouses. Based on the number of flowers produced during the year, these producers are divided into:

1. Small producers growing up to 10,000 flowers per year
2. Medium producers with 10,000 – 100,000 per year
3. Large producers growing over 100,000 flowers per year

The 2008 survey showed that 13 producers have a greenhouses; five of 0.1 ha or more; eight of less than 0.1 ha. The total area was 2.16 ha, so the av. farm size was 0.16 ha. Half of it is used for ornamentals (the other half for vegetable seedlings). Average production is 83.000 plants (so 100.000 plants/ha). Total production was 1.1 million annuals; 0.9 million were produced by 4 companies; the remainder by 10 small farmers.

Producers of ornamentals in open field
They mainly deal with ornamental shrubs and trees. Some combine this with top fruit production. Based on their surface, these producers are divided into:

1. Small producers with a production area of up to 1 ha
2. Medium producers with a production area between 1 and 5 ha
3. Large producers with a production area of over 5 ha

The 2008 survey 13 producers with open field production participated; one had 5 ha; six had 1-5 ha and the others less than one ha. The total area was 29 ha; so the av. size is 2.2 ha. The total area in the country is believed to be 50 ha, of some 30 farmers. The total production of the farmers in the survey was 275.00 perennials. Of this 188.500 were grown by 4 producers with more than 40.000 trees each; the remainder was produced by 9 farmers with 25.000 trees or less. If all farmers have 9.600 plants/ha (as in the survey) total production is half a million trees.

6.1.3 Crop husbandry

Technology applied by producers of annual ornamentals
According to the technology applied, the production of annual ornamentals is mainly organised in greenhouses according to the following division:

Polyethylene greenhouses – simple tunnels characterised by:

- A surface of 100-300 square metres
- Simple constructions of metallic pipes (20-30 mm), often combined with wooden parts and the height of the greenhouse is 2 m at maximum
- 1-2 year resistance polyethylene is used
- Ventilation is mechanic through the entrance and (sometimes) the sideways
- Hand irrigation
- No heating is used – in most cases warm beds are used
- No mulching or shading
- Diverse non-professional pots are used (yoghurt bowls)
- Substrate: Professional for seedlings (only some farmers) and non-professional for transplanting (using soil and manures)

Block greenhouses with regulated temperature, characterised by:

- surface of over 500 square metres
- construction more stable with galvanised pipes 50-100 mm thick
- 3-5 year resistance polyethylene cover is used, in some cases even 20-30 year resistance polycarbonate
- Ventilation is mechanic, in sideways and roof (in some cases even automatic). Adequate ventilation significantly improves the quality of the plants
- Drip and sprinkler irrigation systems (virtually all in the survey)
- Hot water heating system is used
- Concrete floors (3 in survey) or plastic mulch often with shading nets (also 3)
- Professional pots are used during the entire process of production
- Professional substrate for seedlings and transplanting

Block type of greenhouses are more stable and sustainable and provide more security from natural disasters, winds, storms as well as facility at work and use of mechanisation.

In 2008, only 7 producers had some form of heating; most of them using wood and/or coal. Such systems provides security during extreme low temperatures and allows for and early production (in periods when prices are high).

Professional substrates are expensive, but this is compensated by the better quality, early production and by avoiding pests and diseases. Using professional pots and surface mulching has a positive impact on quality and give a rational use of the surface area.

Technology applied by producers of ornamentals in open field
Producers of ornamentals in open field apply a quite extensive technology. They have not yet started with producing in pots, with equipment for uprooting and packing, drip irrigation, shading, protection from pests and diseases and adequate fertilization. This leads to poor quality and late production. Under pressure from higher quality imports, the technologies used are, however, improving.

Initially, the coniferous Thuya Compacta was produced. Its production is declining due to its poor quality; it is being substituted by more qualitative types, such as: Thuya Smaragd, Chemocyparis Alumii, Taxus Bacata, Cupresssocypasirs Leylanii, etc.

6.1.4 Inputs

Farmers are increasingly using high quality inputs. New technologies introduced by local and international development organisation lead to an increase in demand and an improvement in input supply system. Input dealers established links with international companies and introduced new inputs. The main inputs for this kind of production are:

Hybrid seeds
Nowadays producers use hybrid seeds from well-known international companies. This adoption has influenced in the decrease of losses due to the high germination of the hybrid seeds and increase of market demand for new selected types.

Seedlings
A small number of producers are involved in seedling production due to lack of knowledge and adequate technology. Seedlings are produced in small quantity from seeds and cuttings, but the largest quantity is imported from neighbouring countries.

Substrates
Producers mainly use manure, mixed with soil and sand; however, with the use of (expensive) hybrid seeds, most started planting in professional substrates. The use of substrates after transplanting (during the cultivation of flowers) is still minimal. Because of the low demand for professional substrates, they continue to be imported from well-known European producers such as Klasmann, Floragard etc.

Fertilisers
Fertilisers with inadequate content of nutritive elements are still being used, except in rare cases where the use of special fertilisers, in particular crystalline ones, has emerged. Its use improves the quality and promotes a quicker and denser growth of plants.

Pots and trays for the production of seedlings
Seedlings were mainly produced in warm beds, before transplanting in non-professional plastic bowls. This took longer because roots need time to adapt to the new soil, causing late production and losses. Today most farmers use professional trays which shorten the period of production, increase the germination and rationalise the use of the production area.

Imports of technologies and inputs
Of the 13 greenhouses, six were imported (from France, Switzerland, Italy). Most inputs (seeds, pots and compost) are imported from different countries. Most seeds come from Holland, Germany, and Switzerland and some from USA and UK. There is only one kind of compost produced domestically in limited quantities. Virtually all farmers use imported substrates. Several smaller farmers buy inputs from bigger ones who do the imports.

Specific inputs for ornamentals are also sold in gardening centres, alongside ornamentals. General inputs are mainly sold in agriculture pharmacies. Input traders provide farmers with advice on the use of inputs during their selling process. This advice is very important, as the technology in the sub- sector develops rapidly.

6.1.5 Post harvest issue

There is no specific packaging and designing activity for ornamentals. However, recently there has been some movement in putting informative labels to different products. The purpose of this activity is to have the clients basically informed on the type, method of planting and maintenance.

6.1.6 Quality, grading and sorting

Final products are subject to grading and sorting before being launched to the market. Producers grade flowers based on the following parameters: development of the roots; abundance; number of blooming flowers; colour intensity; shape; possible mechanic damages and signs of any disease.

Although no specific criteria for grading exist, generally two classes are distinguished. The first class is intended for specialised outlets (incl. supermarkets) and landscaping and the selling price is 10% higher. The second class is intended for regional and local markets.

6.1.7 Marketing

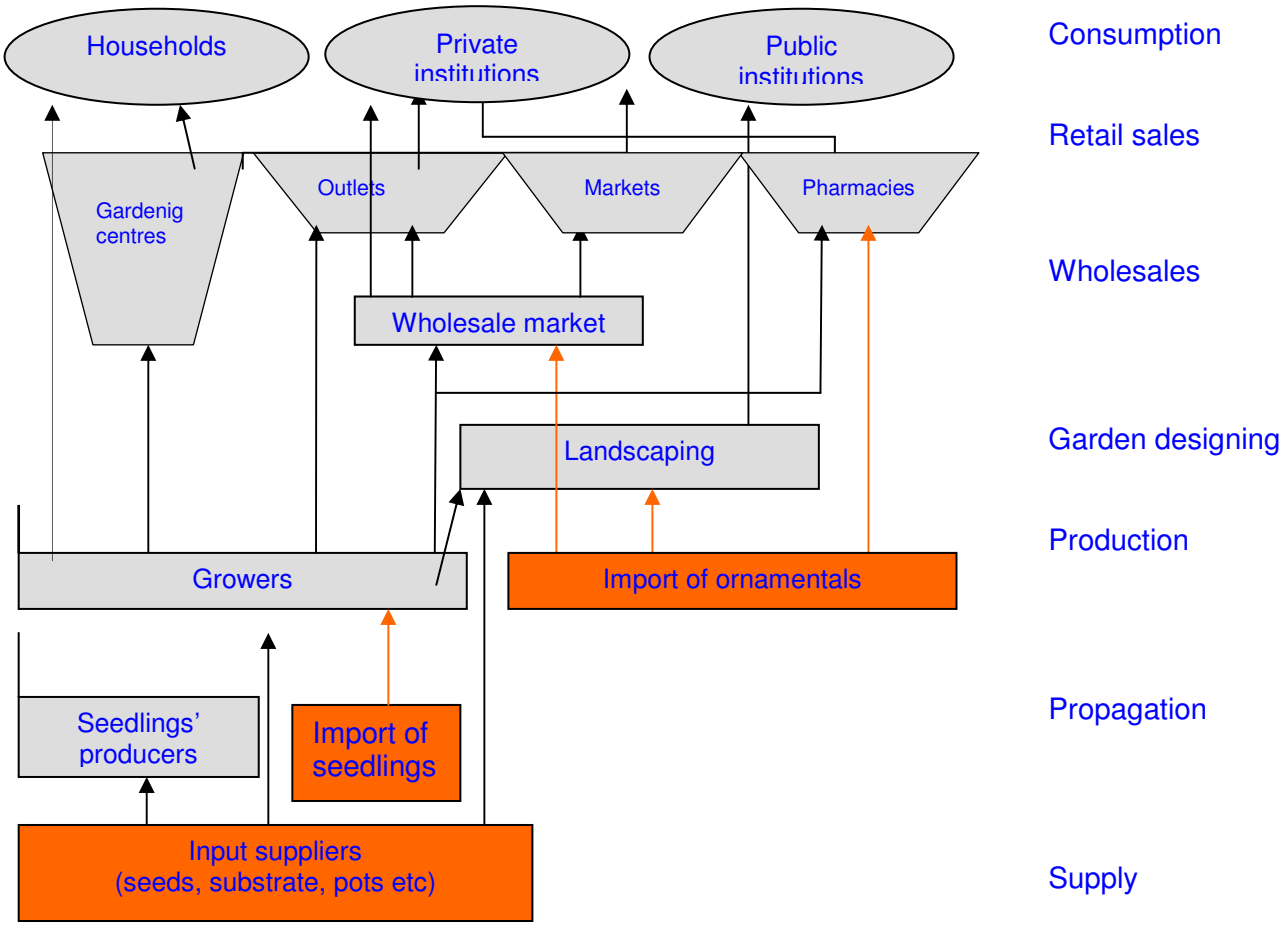
Marketing channels
Producers with more advanced greenhouses produce higher quality flowers which are sold in specialised market channels such as flower shops. Producers who apply poor technology produce lower quality flowers which are sold in markets. Based on the quality, market channels can be subdivided as follows

- Specialised outlets
- Gardening centres
- Department stores
- Agriculture Pharmacies
- Regional markets
- Local markets
- Stalls

For perennial plants, direct sales via landscaping are an important and lucrative market.

Big clients usually order electronically or by phone. Big buyers get a discount on the price. Supermarkets are the main beneficiaries of this. Transport costs are not included in the price due to the short distances. Big clients can get their produce on credit as well. Small clients go to the selling place, get introduced with the produce in stock and then order.

The following chart provides an overview of the market channels in the sub-sector:



The 2008 survey shows that 60% of the produce goes to wholesalers and 40% to retailers or consumers. Big companies sell 80% to wholesalers; small ones sell more to retailers.

Market size

The market size is difficult to establish as much is imported and data on this are not very clear (due to unclear custom codes). The WG estimated the total market at 2 million for annuals and 1.5 million for perennials.

6.1.8 Export and imports

For annual plants the annual import is estimated to be 1 million pieces. For perennial plants the import is estimated to be 1 million as well.

Prices of domestic ornamentals are generally competitive with imports on the local market; however, they are not competitive if exported, due to high cost of production and transport.

Prices of imported ornamentals increased in recent years while for domestic production prices remained constant; this encourages both producers and the final buyers.

6.1.9 Policy environment

There is no specific policy for the sub-sector. The most important issue is that MAFRD through its fiscal policies exempted most of agro-inputs, agricultural mechanisation, complete greenhouses and compost from custom duties and VAT.

6.2 Potential growth

6.2.1 Increased productivity

The income that farmers can get from apples while using good practices is presented in the next table:

Table: Income of ornamental in greenhouses (0.1 ha)

	Yield (plans)	Price (Euro/-kg)	Gross income	Fix costs (Euro/ ha)	Var. cash costs (Euro/ha)	Family labour (Euro)	Income from land, and capital	Income from land, capital and family labour
	(a)	(b)	c = a x b	(d)	(e)	(f)	(c-d-e)	(c-d-e+f)
Current	97,000	0.30	29,100	1,030	27,710	3,300	360	3,660
Best Practice	135,800	0.30	40,740	1,030	28,542	3,990	11,168	15,158

Source: Calculations of the Working Group

Farmers with a greenhouse, using their own labour, can generate 3.700 Euro/year for 01 ha. This is very well in line with what farmers earn with other crops in greenhouses. Using the best practices pays out well: the income raises till 15.000 Euro per ha.

The few data available for ornamental trees in open field show that the farmers make very good profits of well over 30.000 Euro/ha[23]. This seems excessive and must either be caused by mistakes in the data or by a monopoly.

6.2.2 Potential market growth

No reliable data are available on total consumption because imports, which dominate the markets, are not registered separately. So the WG could only make some guesses.

The demand for annual plants is growing fast. Presently 2 million pieces are sold, of which 1 million are imported. In 2013 the demand is estimated to have risen to 8 million; of which 3 million will be imported. At the same time, 1 million could be exported (to Albania, Montenegro). This leads to an additional demand of 5 million plants in 2013. With the

[23] Based on importing Thuja seedlings for 1.2 Euro from Serbia that can be sold for 8 Euro after two years and for 14 Euro after years without too much expenses

present density of 1.000.000 plants/ha, an additional 5 ha is needed. With the optimum density of 1.4 million plants per ha, 3.4 ha will suffice.

The market for perennials is estimated to triple from 1.5 million to 5 million; especially as municipalities and other public institution are increasingly investing in landscaping and 'greening' the cities. Half of the 5 million is supposed to come from local production: so an increase of 2 million. As export (Albania, Macedonia, Montenegro) is supposed to increase to 0.5 million, the total additional production will be 2.5 million. With 10.000 plants/ha, this require 250 ha additional land.

6.3 Support needed

6.3.1 Access to inputs and technologies

Virtually all issues raised on vegetable production in greenhouses apply here as well. Additionally the establishment of specialised seedlings producers would be a major step forwards.

6.3.2 Access to markets

Improving the quality
Many modern inputs and technologies do improve the quality of the produce. In practice this refers to better ventilation, better plastic films, good seeds and seedlings, using pots and substrates, using proper fertilisation and appropriate pesticides

Diversification
For annuals the timing of the production is crucial. Better inputs and technologies do lead to earlier production and/or to later production.

The number of species and cultivars that can be grown can still be greatly enhanced. The main constraint in taking up new species and cultivars is the lack of knowledge and experience. The general pattern is that imports will be used to open up and test markets; once a new product is successful, it can be produced locally.

In the marketing as such several improvements can de made:

- sell via special shops and garden centres
- improve grading, sorting and packing
- promotion campaigns, using the gift market (Valentine day, etc.)
- increase added value by making bouquets, integrating flowers in other garden products (like pots/ buckets etc.)

6.3.3 Access to finance

The 2008 survey showed that half of the produces have loans; most 10 - 20.000 Euro and for 2 years. Generally, they pay 12% interest. However, both the present farmers as well as those who would like to enter the business face a shortage of capital.

The investment for greenhouses suitable for producing annual plants is 500.000 Euro/ha. With an additional 5 ha this means 2.5 million Euro is needed. The investment for 1 ha of open field to produce perennial trees is 15.000 Euro. So for 250 ha a total investment of

3.75 million Euro is needed. Considering the good profits with perennials the main problem is not capital but knowledge and skills.

Looking at the role of the state to stimulate investments, the focus should be on greenhouses for the annuals. Using a similar percentage as for investment in vegetables greenhouses (30%), 750.000 Euro is needed in five years or 150.000 Euro per year.

6.3.4 Access to knowledge and skills

Producing quality flowers and bedding plants is the most knowledge and skills intensive sub-sector in agriculture; it is no surprise that the lack of threes is the most limiting factor.

Education. Neither high-schools, nor university had any subjects on ornamentals. Recently some high schools have included this sub-sector in their curricula. These schools are establishing links with farmers to provide students with practical knowledge.

Training. To build the professional capacities of farmers development agencies organised trainings and study tours within Kosovo. They provided information on production technology, preparation for the market and marketing – packaging, labelling. Capacity building was particularly influenced by study tours in countries with a developed ornamental sector and visits of international experts to Kosovo. Exchange visits of elementary producers to the more experienced producers have proved to be very positive.

Advice. Producers of seedlings and ornamentals provide very useful advice to their clients – small producers – through catalogues and brochures developed by them or received from abroad, or verbal advice during the process of selling. This advice contributes to the increase of production and quality of products.

Publications. Most producers gained technical knowledge through their own experience; there are few information sources (books, domestic advisory services) concerning this type of production. After the war, two books on ornamentals have been published:

1. “Cultivation of flowers”, Dr. Gjokë Vuksani and Mr. Nexhat Balaj
2. “Types of ornamental plants”, Hafir Sedolli.

All in all, to date the sub-sector depends heavily on imported knowledge and skills. The historic roots of that are clear. The strategic question is how to get access to the skills available abroad. One option is to send people abroad for training and internships. Another option could be to invite one, or a few, foreign companies to invest in Kosovo by offering them a tax break (for 7 -10 years) on the condition that they train local people.

Obviously, the extension system that has to be set up should pay attention to ornamentals as well. However as the number of farmers involved is very limited, it seems they could learn most from each other. They need to form a study circle to organise simple experiments and field demonstration among each other.

6.3.5 Policies and regulations

No particular policies and regulations need to be mentioned here. One can refer to those in the chapters on vegetables. On a practical level it is important that MAFRD stimulates public bodies to invest in landscaping and in using registered companies for this,

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Part III: Cross cutting themes

7 Cross cutting themes

To support the different sub-sectors, general services and support structures are needed. How these could look like is discussed here.

7.1 Access to technologies

In terms of efficiency and increasing farmers' incomes, major gains can be made by using better inputs and technologies. The most important issue is better seedlings of perennial crops. In the next few years, farmers will plant the apples, grapes, pears and other fruits that will determine their competitiveness for decades. Therefore, the quality of seedlings is of paramount importance. A strong nursery industry is needed to deliver many quality seedlings until 2013. However, in the long run the demand for seedlings will decrease.

To stimulate high quality seedling production the following steps should be undertaken:

1. Register interested nurseries
2. Design and implement a strict inspection regime for them
3. Reward those who produce quality seedlings with a matching grant. For each quality seedling they get a high quality, imported seedling for free.

The advantages of the system are:

- more high quality sapling will come on the market for a lower price
- nurseries get a strong incentive to register and to apply proper methods
- low quality nurseries become less profitable
- MAFRD inspectors will be more motivated to do their job properly
- It avoids creating overcapacity in nurseries.

Such a system could be set up by MAFRD in cooperation with a donor project. Training of all stakeholders should be an important element of such a project.

The second priority is to improve the seedlings for annuals (vegetables, ornamentals) by introducing new technologies (substrate, pots). Projects can be very useful in this; for MAFRD it requires too much manpower to get involved in all details, but it can stimulate the process by giving financial support for investments in high quality greenhouses.

A third issue is the need to provide quality greenhouses at reasonable costs. HPK has been working on this with some companies that construct greenhouses. This needs further exploration and support. The link made with Albanian expertise in this area is very useful. Again, the role of MAFRD could remain limited to financial support.

A fourth strategic priority is to deliver quality inputs (fertilisers, crop protection chemicals) to farmers. This is primarily an issue for the private sector. The most efficient way is to link input suppliers to international companies that have a huge range of inputs that need testing and adaptation to the specific Kosovo situation. AKA is the most important player in organising input dealers. It does need to be strengthened, if it is to play a role beyond exchange of information and some lobbying. MAFRD has to create a proper legal context, e.g. by developing green and yellow lists of pest management measures and pesticides.

MAFRD supports the input supply by waiving nearly all custom fees and VAT on imported inputs. It does need to provide more support, in the form of a functioning AKIS that can organise applied research, field test for inputs under Kosovo circumstances, fairs and exhibitions and demonstrations to allow farmers to compare inputs of different companies.

7.2 Access to markets

7.2.1 Quality standards and certification

In any value chain, quality standards help to reduce transaction costs as both partners in the deal know exactly what the deal is about. In the horticultural sector in Kosovo, there are no quality standards. Apples or tomatoes are somehow sorted in first and second grade, but the criteria used depend on the farmer/trader involved. When larger quantities of produce are consolidated, the lack of quality standards leads to a lack of homogeneity. This is probably the most important factor for wholesalers to prefer imports.

MAFRD needs to introduce and promote international standards; first of all in basic issues like the size and colour of fruits. Project could assist in making and promoting the necessary grading charts.

One cross-cutting theme is Organic Agriculture (OA) which receives much attention from policy makers, partly under pressure from the EU. The EAR-supported Marketing Support Project (MSP) explored the prospect of promoting organic agriculture and concludes that:

- "in practice OA would remain a very long term objective as certification required to assess farmer compliance would be both difficult and costly to implement."
- "The most practical feasibility of expanding OA is as a niche market".
- "MSP therefore focused upon the safe use of pesticides and fertilizers in line with GAP/IPM practices….. This could be enhanced by giving producers better access to more complete and usable IP/IPM production information."

The present strategy follows the same logic: presently Organic Agriculture has a very small local market and (due to a lack of certification option) no export prospects in the medium future. The best first step to be taken is to train farmers in IP methods.

7.2.2 Market information

There are three sources for agricultural price information: the Statistical Office for Kosovo (SOK), the Market Information System of MAFRD (set up by MSP and published on www.foods-ks.org) and the HPK project.

Unfortunately, the prices collected by the different actors are not easy to reconcile. The general trends are similar, yet concrete data can differ widely; e.g. the wholesaler price of tomatoes in Pristhina in July 2007 is 35 cents in the MIS, 47 in the HPK data, and 51 cents in the SOK system. Equally unfortunately, the prices provided by the MIS from different regions do not seem realistic. While in July 2007 the av. wholesale price for tomatoes in Pristina is 35 cents, in Peja it is 23 and in Djakova 41 cents. With a free market and very short distances, this is impossible. Such differences threaten to render all data collection useless.

The MIS system is based on prices collected in 7 regional centres of MAFRD. This set-up makes it the most sustainable system, yet it suffers from severe set-backs, like all MIS in small countries with a poorly developed agricultural sector[24]. We have already seen that the data are not accurate enough to be used for marketing decisions by farmers. This is

[24] On the internet one can find several 'aborted websites' of agric. MIS set up by donor projects that failed to become sustainable (e.g. www.albamis.org and www.agroinfo.com.mk).

also not needed; mobile phones allow farmers (with substantial amounts for sale), to consult people on different regions/markets before taking any decision.

The actually usefulness of a MIS is more in the area of statistics and trend analysis. Long term price trends are crucial for making business plans. In this sense, it is understandable that Raiffeisen Bank sponsors the MIS system.

Making any MIS sustainable is complicated. One way is to sell price information via SMS-services. Another is selling subscriptions to a Webpage with information. Such webpages can provide not only price data, but also matchmaking services (like the well known E-bay). In small countries with poor farmers and processors, the incomes are not enough to sustain the substantial costs of collecting, analysing and disseminating data. In bigger countries (e.g. Rumania, Ukraine) and in wealthier countries some private MIS can manage to recover a substantial part of their costs through publishing the data in their own agricultural magazines (that are profitable due to advertisements). It will take a long time before such a market will emerge in Kosovo. In the mean time, MAFRD also needs market data to design evidence-based policies. In par. 7.5 this will be further explored.

7.3 Access to finance

Some farmers can gradually expand their production capacity based on their own savings. In many other cases, their income does not allow them to make the investments needed to create a semi-commercial farm. Commercial credit is very hard to get due to a lack of collateral and limited cash flow from other activities. Even if one gets credit, the high interest rate absorbs most of the profit to be made.

MAFRD should support farmers financially, as without the necessary investments, Kosovo will have to continue to import products that it can produce itself. This leads to a loss of foreign currency and of jobs in rural areas. The fact that neighbouring countries support their farmers as well makes this support even more urgent.

On the other hand, it is well known that providing agricultural subsidies can easily lead to counter-productive outcomes. The best known example is the EU-subsidies that lead to massive over-production causing problems for farmers both in and outside the EU. The best way of providing financial support is to subsidise the investment, not the production. Farmers are stimulated to invest but they themselves remain responsible for all risk and all recurrent costs. In practice, this means: use matching grants or investment subsidies.

Several steps have to be taken to set up an adequate financial support system:

1. Decide on the budget
2. Determine priorities based on long-term competitiveness of sub-sectors and expected impact of investments on farmers' incomes and job creation
3. Decide which investments will be subsidised; this should be directly linked to the use of inputs/technologies that are known to be competitive
4. Decide on the amount to be subsidised. In order to avoid too much distortion of markets this should as much as possible be the same for all sub-sectors. In general, 30% of the cash investment seems reasonable.
5. Determine the criteria for eligibility. Preference should be given to family farms, farmers with experience and SMEs. Worldwide family farms are most competitive as they are the most efficient users of the available (natural) resources
6. Determine minimum and maximum amounts per beneficiary: e.g. 2.000 - 8.000 Euro

7. Set up a transparent procedure to select beneficiaries. Involve representatives of the sector in the selection
8. Assist potential beneficiaries in filling out forms (e.g. via municipality staff)
9. Design a simple scoring form to select beneficiaries; use only relevant criteria (= criteria directly related to competitiveness). Avoid unclear criteria ('motivation of farmer'). Distinguish two categories: 'qualifies for support' and 'does not qualify'.
10. If not all who qualify can get support, the order in which they will get support is decided by a lottery. Those who do not get support now, get priority next time
11. Publish results per municipality: *who* gets *how much* and for *what*
12. Hire independent experts to monitor the (selection) process and the impact on productivity and farmers' income
13. Publish the report of the independent monitors

Creating a transparent and efficient payment agency based on EU-principles is one of the priorities for MAFRD in 2009. It will get external support for this. One input in the design process will be the pilot project set up by ISMAFRD in Prizren. The present strategy should be another. A third input could come from pilot projects implementing specific elements of this strategy.

Payment schemes call for an in-depth understanding of the subs-sector. Otherwise, there is considerable risk that subsidies do not lead to the desired outcomes. One example of insufficiently informed policies is the efforts of several actors in Kosovo (like in Albania) to promote high-tech greenhouses; while a closer look at the technical and economic parameters reveals that this is not a viable option.

Within the overall horticultural strategy, subsidies are to be directed to those activities that have the biggest impact in terms of additional income and jobs created. The next table gives an overall view of the efficiency of investments in the different sub-sectors.

Table: The efficiency of investing in different sub-sectors

	Growth potential/ replacement needs (ha)	Investments needed (Euro/ha)	Total investment (million Euro)	Extra income generated (M. Euro p.a.)	Extra labour generated (1.000 days)	Extra annual income per Euro invested	Extra labor per 1000 Euro invested
Apples							
Semi intensive	330	10,000	3.3	1.82	69	0.55	21
Intensive	240	15,000	3.6	2.33	99	0.65	27
Apple Stores (t)	5,000	500	2.5	1.5		0.60	
Greenhouses							
Mid level GH	100	150,000	15.0	2,59	209	0.17	14
Table grapes							
Best practice	875	13,000	11.4	3.53	95	0.31	8
Ornamentals							
Best Practice	3.4	300,000	1,0	0.52	14	0.51	13
		Total/average	**36,8**	**12,3**	**486**	**0.33**	**13**

The table shows that in the next five years 37 million has to be invested, which will generate 12 million extra income per year and nearly half a million labour days. If one assumes that one person works 200 days/year, this equals nearly 2.500 fulltime or 5.000 part time jobs.

Generally speaking, apple production scores best; for every Euro invested, farmers earn 0.6 Euro extra every year and 25 days of work are created for every 1.000 Euro invested. Table grapes are rather efficient in generating income; yet they do not generate much work. Greenhouse production (both vegetables and ornamentals) have good potential to create jobs, but financial returns for vegetables are low.

Investment subsidies can also be useful when they are linked to investments with leverage in several value chains; e.g. subsidising a carton factory can bring the price of carton boxes down to a level that all farmers can use them. In such a case, an in-depth analysis is needed of the value chain and the potential leverage of the subsidy.

7.4 Access to knowledge and skills

The Agricultural Knowledge and Information System (AKIS) of Kosovo is weak and still under construction. The main elements are the Agricultural Faculty of Prishtina University, the Kosovo Institute of Agriculture (KIA) in Peja, the Rural Advisory Service of MAFRD (with experts in Pristhina and regional centres) and the agricultural staff of municipalities.

KIA operates under MAFRD. Its primary role should be in the fields of applied research, support to the extension system (training of trainers and advisory services) and technical advice to the Technical Departments of MAFRD. In practice it functions more as a laboratory for a number of issues. It has a substantial tract of land (70 ha) that is used to generate some income, but it needs substantial recurrent funding to initiate and sustain an adaptive (applied) research programme.

The extension staff is part of the Regional Development and Rural Advisory Service (RDASD) in MAFRD. The mandate of the department focuses on rural development and coordinating regional offices, rather than on providing direct advice to farmers. At national level 4 people work within RAS and in each of the five regions and two sub-regions where MAFRD has a coordination office, one person is responsible for advisory issues. There is no formal link between these nine people and the agricultural staff in the 30 municipalities. The latter are employed by the municipalities and have a range of tasks, among which extension is only one.

The extension system was supported by three EAR projects[25]. The main activity has been to train extension workers and farmers. The long term strategy has been formulates as[26]:

> In line with international best practise, and to gain maximum benefit from limited resources, MAFRD will facilitate and coordinate the development of private and NGO service providers, but NOT seek to unduly control or regulate the market of service providers in the belief that the selection and assessment of service providers will be best achieved by the market.
>
> MAFRD's pluralistic advisory and support service strategy envisages that farmers will have access to multiple sources of advice and support from public, private and NGO service providers. In the long-term most advice and support will be obtained from a market of private sector service providers.

[25] Strengthening of Agricultural Support Service (SASS 1&2) and Rural Advisory Services (RAS)
[26] Quote from the final report of SASS 1

In line with this, in 2008, the department outsourced extension tasks (via a tender) to a NGO (KDC). Another step has been to establish a database of certified agricultural advisers to support the creation of an effective market for advisory services.

A number of projects and NGOs provide advisory services to farmers as well, mostly in combination with other forms of support. Most work along the lines of the MAFRD policy; e.g. they use a (kind of) voucher system that allows farmers (associations) to select their advisor. This is not without problems, as they are not always able to identify the best candidate; either due to a lack of knowledge or due to social pressure. Another problem is the scaling up of such initiatives; this can lead to advisors buying vouchers from farmers, without delivering the (full) services[27].

The third major players are input suppliers. They have developed quite well in the last years and some employ experts who provide advice to clients free of charge. Yet, some report that they sometimes advise the use of too many inputs or not the most adequate ones.

Despite the progress made on the advisory system, important constraints remain. First of all, there is no comprehensive and systematic approach. NGOs and projects dominate in most areas; as long as they do so it is difficult for MAFRD to set up a relevant system. As regards the government system, the main constraints are related to the agriculturalists in the municipalities. They suffer from several shortcomings:

- a lack of coordination as MAFRD has no formal relations with them
- a lack of specialisation. Municipality staff are generalists with many tasks; e.g. to collect statistical data (for which they are paid separately).
- low salaries and (therefore) low motivation and often limited knowledge and skills
- limited access to transport and other means needed to reach farmers.

All stakeholders are keenly aware of these constraints. As it seems unlikely that the institutional setup will change in the near future, one must conclude that for the present horticultural strategy a new, more innovative and flexible system is needed.

NGOs or projects are generally in a better position; they offer higher salaries and better working conditions. They also provide more integrated and more specific support to farmers: in addition to advisory services, they offer (access to) inputs and technologies, and sometimes (access to) capital and markets as well. The most advanced projects/NGOs started to charge farmers for advice; e.g. apple clubs of 15-20 farmers supported by HPK pay one quarter of the costs of an advisor with HPK paying the balance – but on a declining basis. Despite positive experiences, projects are not a long term, sustainable solution.

So several experiments have been done; the next step needs to be to integrate the approaches, along the lines of the MAFRD policy: create a transparent market for NGOs/private companies that can provide adequate advisory services to farmers. The main actions to be taken would be for both MAFRD and projects to confirm their commitment to this policy. This means:

- tender all extension assignments among NGOs and private companies
- avoid setting up an extension service based on units covering all issues in a geographical area. In small countries this leads to a high percentage of staff involved in supervising/coordinating the work of a few others.

[27] For example in Albania this happened even in a rather small scale experiment by a NGO

This allows MAFRD to reduce the overhead costs to a minimum, as its role will be limited to regulatory and general policy issues. It can be expected that the NGOs/companies will specialise themselves and that they will work with a pool of experts (who can be part-time employed as well). This is standing practice among NGOs and projects and allows for an efficient use of the limited number of high quality experts available.

To reduce costs, group methods will be used often and farmers need to be encouraged to form study circles. Farmers have to pay part of the costs as well. Initially some 20%, over time this could be doubled.

A national extension council should be set up of all stakeholders: MAFRD, representatives from farmers, agribusinesses and NGOs/projects. This council should decide on priorities, supervise the tender procedure, design training programmes for private advisors and be responsible for their certification. The impact monitoring should be done by MAFRD staff, supported with external experts when needed.

An Agricultural Research Council should be established as well. Kosovo is too small to sustain a comprehensive research system; it has to be very selective in what research can be done and what technologies or knowledge can be imported via strong links to regional (Albania, Macedonia and Serbia) and worldwide research centres.

7.5 Policy development

Agricultural policies are designed by the policy department of MAFRD. Yet, as they lack data on issues like consumption, production, cost structures and prices, it is virtually impossible to design evidence-based strategies that can convince policy makers that money invested in agriculture will lead to the desired results: better incomes for farmers and a more competitive sector. Such policies are becoming increasingly relevant as Kosovo, like its neighbours, starts to invest in direct payment to farmers.

Unfortunately, the Farm Accountancy Data Network has not yet been able to deliver relevant data. Still accurate data on markets and on-farm management issues are the cornerstone of any agricultural strategy or policy. In the future, collecting and analysing such data should be done by an independent organisation for agriculture policy research.