# IMPACT OF FISCAL POLICIES ON INPUTS AND PRODUCTION COSTS IN GREENHOUSE IN ALBANIA

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## ABSTRACT

This paper analysis agriculture input related taxes and tariffs policies and their impact on input prices, production costs and profitability, focusing on the greenhouse sector in Albania. The study combines desk research and expert interviews to collect data and to analyse the main policy reforms and the tariff regime. A financial cost benefit analysis is implemented in order to observe the effect of the change of taxes in both sides: at farm gate profitability of Albanian farmers as well as in terms of revenues forgone in the state budget based on revenues collected.According to our research findings, tax exemption on inputs such as agrochemicals and fuel would significantly affect positively the profitability at the farm level and the overall agriculture sector competitiveness. Several political implications of the various scenarios of tax reduction are discussed and provided to policy-makers.

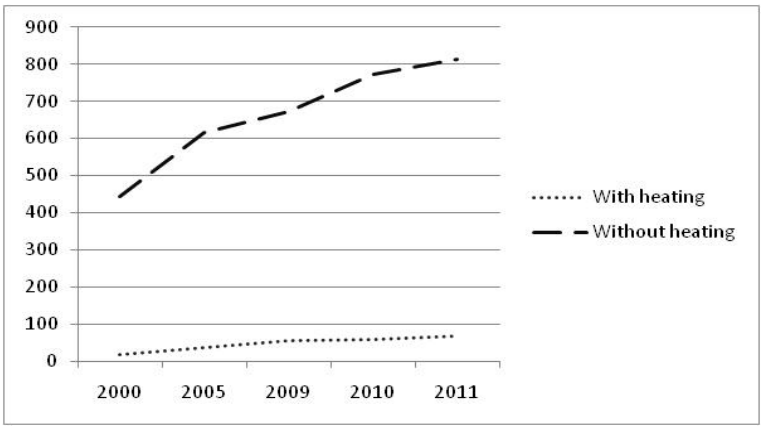
**Keywords**: Albania, Fiscal policies, Greenhouse production

## INTRODUCTION

Agriculture continues to be an important sector in Albania. Despite its gradual decline over the last decade, the sector contributes a significant share to total GDP, slightly less than 1/5 in 2012 (MoAFCP, 2013).One of the most important and fastest growing subsectors of agriculture is the cultivation of vegetables. Domestic production of vegetables has increased by 9% since 2007 reaching 866,431 ton in 2012. Imports have kept decreasing, and in 2011 and 2012 they were exceeded by exports (in quantity). Moreover greenhouse production has almost doubled from 2000 to 2011 (Figure 1). The cultivated protected area has increased significantly over the last decade – it increased by 100 Ha or 13.7% only in 2010 and a lower growth in 2011 (equivalent of6.2% compared to 2010 (MoAFCP, 2012).

Domestic production dominates by far the domestic market except in the winter months, as production in heated greenhouses is not competitive to imported products, due to high price of fuel for heating – out of the 828 Ha of protected crops and only 57 Ha are equipped with heating technology. Therefore, about 99% of imports (in value and quantity) of tomatoes, from EU -as key trade partner to Albania- take place during the first 5 months of the year (see Figure 2). Similar trends are observed for other vegetables produced in greenhouses.

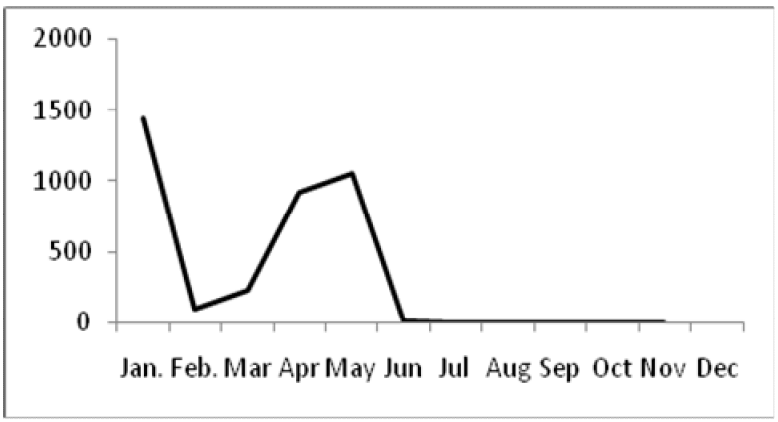
Figure 1: Production of vegetables in protected areas (in Tons per year)




Source: MoAFCP, 2012

One reason behind this seasonal deficit may be the high prices of inputs, which increase the production cost, especially in the case of heating during cold season. Payments for variable inputs such as fertilizers, pesticides, other chemicals, but also fuel and electricity constitute also an essential part of farm variable costs. Thereby in the study, we focus on agrochemicals and energy (mainly heating oil).

Figure 2: Import of tomatoes during 2012 (in Tons per month)




Source: EUROSTAT, 2013

Purpose of the study is to analyse the agriculture input related taxes and tariffs policies and their impact on input prices, production costs and profitability, focusing on the greenhouse sector. The research considers three leading production districts (Fier, Lushnje and Berat) in protected crops production. These farm enterprises offer the best potential for high producer profits and attractive rates of return in their economies. The information, collected data and farm enterprise budgets presented in this study are based on interviews with 15 smallholder farmers, 10 agriculture extension specialists and 5 agro-input dealers.

The study has important implication for the Albanians welfare situation for both farmers and consumers. In 2010, Albanians spend more of half of the household budget for food, beverage and tobacco (51.90%). Moreover, food prices are relatively high in Albania as referred to the food price index in the region (Western Balkans

countries) where Albania lies in top level as shown by Eurostat database (2010). On the other hand, this study is of great importance for the farmers as far as Albania, compared with most Balkans Countries, has the highest share of employed people in Agriculture (MAFCP, 2013).

## FISCAL POLICIESOF AGRICULTURE INPUTS IN ALBANIA – A COMPARATIVE VIEW

Since a decade, Albania has embraced trade liberalization policy with neighbouring countries and EU as part of WTO commitment and EU integration process. On-going trade liberalization and integration implies that Albanian agriculture sector is facing high competition from neighbouring EU and non-EU countries that have far more developed agriculture sector and receive significant public financial support. Albanian government subsidy schemes budget does not exceed on average 10 Million EUR*year$^{-1}$ reaching out few thousand farms per year (MoAFCP, 2011), whereas for example the government budget for agriculture subsidies at the neighbouring country Macedonia (smaller concerning the size of population) exceeds 100 Million EUR (Republic of Macedonia, 2012).

Table 1. VAT level for inputs in agriculture

| Country | VAT | Preferential for agriculture and other specific uses defined by regulation | Agriculture |
|---|---|---|---|
| Albania | 20 | 14 and 0 | There is no VAT exemption for inputs<br>A VAT partial exemption for agricultural output of 6% still not fully operating |
| Macedonia | 18 | 5 and 0 | 5% for seeds and planting materials, fertilizers, plant protection chemicals, plastic folios for agricultural use and agricultural machines |
| Montenegro | 17 | 7 and 0 | 7% tax to fodder, fertilizer, devices for plant protection, reproduction seeds, planting material, veterinary medicine and breeding stock |
| Serbia | 18 | 8 and 0 | 8% for fertilizers, pesticides, seed stock, nursery stock and complete fodder mixtures for animal feeding. |
| Kosovo | 16 | 5 and 0 | 0% for entire raw material, inputs and equipments for agriculture (Regulation 2007/31). |

Source: PricewaterhouseCoopers, 2011, MoF, 2011

On the other hand, Albanian agriculture sector faces significantly higher (input) taxes and tariffs burden compared to other Western Balkan Countries as shown in Table 1. In all Western Balkan countries agriculture inputs has a preferable VAT system approximately at 5% in most countries and zero such in the case of Kosovo.

In Albania both farmers and processors have been recently claiming that the competitiveness of Albanian agriculture is negatively affected by high taxes, high prices of raw agricultural inputs, energy and imported packaging. In Albania there is no VAT exemption on agricultural inputs as it occurs in other neighbouring countries, such as the case of Macedonia and Kosovo. For all agriculture products in Albania (local or imported) a fixed 20% VAT is applied. A 6% VAT rebate is granted to farmers and processing industries purchasing inputs on the basis of formal invoices issued by a taxable subject, but the application of such exemption has been very limited due to the high informality in the farming business which brings to applicants very low possibility to declare the purchases made at farms. This kind of support is simple compared with other developing countries where the VAT for both agrifood inputs and outputs is lower than the overall VAT. A few studies (such as AGENDA, 2011) and sporadic round table discussions in Albania have defined the need for reduction of VAT on final output of agrifood sector.

**Heating energy**

Agriculture sector uses as input 4.5% of the total energy produced in Albania (NANR, 2007) and 10% of fuel energy (NANR, 2007). During the period from 2004 to 2006 a fuel subsidy measure was implemented by the Albanian government,[1] aiming to increase farm mechanization and reduce production costs. The beneficiaries of this measure were mechanical service providers, greenhouses with heating; and dairy processers. Through this measure, entities benefited the foreseen needed quantity of fuel at a price free of excise.

During 2008, the government implemented a scheme for replacing the use of fuel with heating oil[2] for the greenhouses and agrifood processing units which was three times cheaper than the fuel. Despite such initiatives the prices of heating oil tripled during 2010 and 2011 (from 30 ALL[3]*litre$^{-1}$ to 90 ALL* litre$^{-1}$), resulting into an increase in production costs of the greenhouse and processed products. Part of the increase was caused by a government's decision to increase the excise from 13 ALL*liter$^{-1}$ to 20 ALL*liter$^{-1}$, in order to generate more revenues from excises. In 2011 the excise on heating oils increased from 20 to 37 ALL*litre$^{-1}$.[4] Additional to this excise also a 3 ALL*litre$^{-1}$ of tax on carbon was introduced as environmental tax. As a result of all these factors the tax burden for heating oil users doubled compared with 2008.

The heating oil taxes in Albania started to converge with other Western Balkan countries. However a better comparison can be done taking into consideration the tax

[1] Based on the Decision of the Council of Ministers No. 244, dated 23.04.2004, DCM No. 310, dated 06.05.2005, DCM No. 703, dated 16.11.2005. This measure was managed by the Project entitled: "Increase of the Agricultural Production, 2KR" in collaboration with the RDAFCP, Communes and Municipalities. During the period 2004-2006, the amount of 6.6 million Euro was spent and 372 thousand entities have benefited from the abovementioned measure.

[2] Along the text "heating oil" will represent all the domestic type of fuels used for heating purposes inside greenhouses and agro-processing unit.

[3] 1 Euro = 139 ALL

[4] Based on Law No. 10 456, date 21.07.2011

share on the final price. Albania in this case is comparable with countries such as Serbia and Bosnia and Herzegovina (see Table 2)

Table 2: Excises on Unleaded Petrol by countries of the region in 2010

| Country | Tax | Tax rate Euro*liter$^{-1}$ |
|---|---|---|
| Croatia* | Excise tax on oil derivatives- excise duty on the gas oil purchased against presentation of the fuel card by the gas oils consumers for use in agriculture, fishery and aquaculture shall be 0 | 0.26 |
| Kosovo | Diesel | 0.38 |
| | Gasoline | 0.35 |
| Macedonia**(35% in diesel to 45% in gasoline) | Fuel excise tax | 0.35 |
| Serbia**(41% for diesel to 56% for gasoline) | Gasoline | 0.45 |
| | Eco Diesel and D2 | 0.31 |
| Albania (42% to final price for fuel and 50% for heating fuel) | Gasoline and diesel | 0.25 to 0.4 plus carbon tax 0.03 |
| | Heating fuel | 0,25 |
| Bosnia and Herzegovina** (tax 45% to 54% of final price). | Diesel and extra light heating oil | 0.15 |
| | Unleaded gasoline | 0.18 |
| | Leaded gasoline | 0.20 |

Source: *EEA/ OECD Environmentally Related Taxes Database **EC, 2010,

Since 2008, there has existed a scheme of excise reimbursement for heating oil for both greenhouse and processing units.[5] Greenhouse owners have claimed on media that the scheme scarcely functions due to the fractious relations with the tax office.[6]The increase of heating oil prices and the lack of proper functioning of the heating oil subsidies have negatively affected the performance of heating greenhouses. There is a risk that high inputs costs will lead to an increase in the production costs; hampering the late production of vegetables or increasing their final price and thus reducing competitiveness in the internal market.

[5]Based on DCM no. 1158 date 13.08.2008
[6]Top Channel TV, 2010, News of the day, 18 August, 2010.

In Albania, the main components of petroleum oil including here heating oil are not subject to. This is lower than Kosovo and Macedonia (20% mainly for Gasoline, Diesel and Mazut-heating oil components), while for EU countries it is 4% and slightly higher compared to Serbia (see Table 3). Heating oil, also used for agriculture purposes, if coloured and placed in special tankers, is subject of zero tariff duty for EU and CEFTA countries but is still high for non EU members. This is why since 2010 there is a lack of import flows of heating oil in Albania.[7]

Table 3: Tariffs on heating oil components and substitutes (HS code 27101961)

| Country | EU | Non EU | Region |
|---|---|---|---|
| Albania | 0 | 19 | 0 |
| Macedonia | 20 | 15 | 20 |
| Serbia | 0 | 3 | 0 |
| Kosovo | 0 | 10 | 0 |
| Italy | 0 | 0 | 0 |

Source: INTRACEN, 2011; EC, 2010

**Agrochemicals**

Agrochemicals constitute an essential part of the farmers' budget costs. According to a World Bank (2007) study, about 88% of farmers buy seeds and fertilizers (representing 33% of the value of inputs purchased by farms). In 2010, agrochemical imports scored approximately 24 Million USD. The current usage level of fertilizers corresponds to only half of the average yearly usage level during 1976-1988, when the country was producing fertilizers domestically under centrally planned economy (World Bank, 2010a). Among the Western Balkans countries, Albania has the lowest use in $kg*Ha^{-1}$of fertilizers after Bosnia and Herzegovina (Table 4). One plausible reason may be the high prices of such inputs, which are not affordable for low income Albanian farmers.

Table 4.Fertilizer consumption (100 $grams*hectare^{-1}$of arable land)

| Country Name | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|
| European Union | 163.2 | 158.0 | 168.7 | 142.6 |
| Croatia | 294.5 | 293.1 | 314.1 | 387.6 |
| Italy | 171.8 | 177.0 | 190.2 | 156.0 |
| Greece | 183.4 | 148.5 | 115.7 | 143.8 |

[7]Till 31 December 2010, another type of oil was imported and used for agriculture with over 10 ppm, named D2 (HS code: 27101945, and 27101949).

| | | | | |
|---|---|---|---|---|
| Serbia | NA | 117.4 | 146.7 | 115.2 |
| Macedonia, FYR | 62.0 | 55.7 | 66.1 | 56.2 |
| Albania | 50.0 | 54.1 | 55.7 | 38.4 |
| Bosnia and Herzegovina | 24.6 | 15.5 | 21.3 | 11.9 |

Source: World Bank, 2010b

## METHODOLOGY

Desk research and 30interviews are used to analyse the main policy reforms, the tariff regime, the supply of inputs available to farmers, and their use. The study includes comparative data sourced by international databases such as INTRACEN and EUROSTAT Databases and other countries of the region (Bosnia and Herzegovina, Serbia, Kosovo, FYROM and Montenegro).

A financial cost benefit analysis is implemented in order to observe the effect of the change of taxes in both sides: at farm gate profitability of Albanian farmers as well as in terms of revenues forgone in the state budget based on revenues collected in the recent years (based on available data). The study was carried out assuming Albania as a small open economy, which has no impact on international agriculture input and output markets.

A partial budget model (Dillon and Hardaker, 1980; Alimi and Manyong, 2000) is used to assess the income effect of pesticide taxes and fertilizers (under the category of agrochemicals) and heating oil (under the category of energy) on the production greenhouse vegetables. Based on the statistical analysis of the production technology a representative cost structure is defined for Albanian vegetables production. In a later stage of the analysis, this model is used to assess the impact of various input tax exemption regimes on production costs and, eventually, on the gross margin.

Partial budget models tend to underestimate positive income effects from an input tax exemption because the study assumes a fixed technology package and does not take into account any options for pesticide substitution. Hence, according to a partial budget model, an input price decrease, as a result of the tax exemption, affects neither input demand nor pesticide productivity but simply reduces production costs. The method has its limitations as the elasticity of factor substitution is assumed to be zero. If factor substitution takes place, the income effect will be less than predicted with partial budget models. Although factor substitution is an important issue in the assessment of input demand, yet it proves to be very complex. In spite of the limitations, the partial budget approach is a useful tool for the analysis of the effects of a policy change on farm income because it is pragmatic and adequate to employ. In spite of its shortcomings, the partial budget model can still be used to predict short-term income effects of input taxation. Moreover the margins gathered throughout the entire chain of the agrochemicals are taken as fixed and therefore do not react to the possible import price decreases resulting from tax exemptions schemes.

The study is based on Farm Models which include vegetable cultivation (in green house with or without heating and vegetable cultivation in open fields). In order to observe the trends in the main inputs, the study estimates the average production costs' implications for greenhouse vegetables on the basis of an average model farm

with low and high technology. Since the use of the above mentioned inputs is more intensive in greenhouses, the focus of the analysis will be on protected field crop production.

With regard to greenhouses, four cases of greenhouses will be analysed, grouped according to the technology and the intensity of the heating system. The study takes into consideration two types of greenhouses (as shown below and in Table 5):

1. The low technology greenhouses which have plastic cover and rely on sun energy and which then are divided in two types: (i) with limited heating normally used by the farmers due to very high costs and (ii) without heating system;
2. High technology greenhouses which are further divided into two subcategories, namely greenhouses with medium capacity of the use of heating system (in terms of number of hours used) and those with full capacity of the heating system.

Table 5: Case studies selected for analysing the greenhouse cost performances under various scenarios

| Type | | Technology | |
|---|---|---|---|
| | | High | Low |
| Heating | With | Analysed for 1)Medium 2) Full | Limited heating |
| | Without | Not analysed | Analysed |

A scenario is analysed for each case with respect to their profitability effects. The reference case is the actual situation based on the existing VAT and excises for energy and packaging. The second one is a scenario where VAT reduces at 6% and excises influencing on some of the inputs (especially the fuel heating) are exempted.

Besides the assumption stated at the methodology part, there are several assumptions for the farm operation. The farm has no loans and the asset replacement, based on expert assessment, takes place every year at an average rate of 10 %. In the cost scenarios of greenhouse with heating the heating oil value is calculated with the current price of 130 ALL*litre$^{-1}$.The surface of the greenhouse is 0.1 Ha. The soil potential and quality, as well as water quality remain constant.

The models of production taken into consideration are those performing two seasons starting first with cucumber and ending with tomatoes. The spring season starts with planting which mostly performs during January. The second planting, is usually performed during August and enters in production in late autumn, until the eve of winter. Yields realized on tomato and cucumber in this period appear to be noticeably lower than those of spring (tomatoes production is on average 50 to 70 tons*ha$^{-1}$and the cucumber 60 to 80 tons* ha$^{-1}$). Table 6providesa summary of the assumptions made.

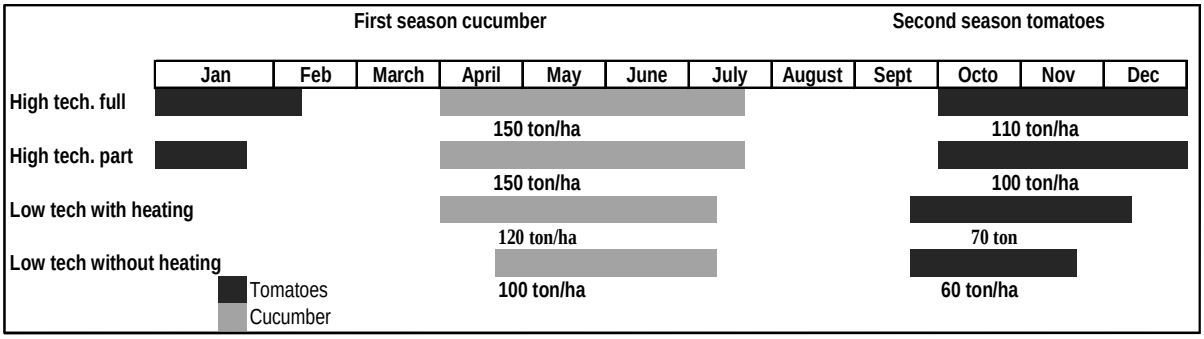
Table 6: Assumption and settings for various greenhouses

| | *Low Tech* | | *High Tech* | |
|---|---|---|---|---|
| Heating | No | Yes | medium | Full |
| Output [t*ha$^{-1}$] | 160 | 190 | 250 | 260 |
| Average price [ALL*kg$^{-1}$] | 50 | 60 | 65 | 70 |
| Fuel [l*ha$^{-1}$] | -- | 27,000 | 47,000 | 98,000 |

Source: Own calculations

The parameters including yields are based on expert assessment, resulting from interviews conducted with farmers and agronomists as well as research made in the recent years (Balliu et al, 2006; DSA, 2010). Figure 3 shows the schedule of production and the yield achieved by the greenhouses according to the technology types.

Figure 3. Greenhouses schedule of production and the yields achieved for 2010




Source: Own calculations based on producer and expert assessment

The data were gathered using structured interviews (incorporating also excel sheets) including data on inputs used both in quantity and values. The cost of the products are divided in four components i) The cost of raw material and direct labour work force; ii)The agrochemical costs as seed, fertilizers and pesticides; iii) energy cost (electricity or fuel) and iv) other cost including mainly transport, packaging and marketing. The shares (in percentage) of these components to the total cost of the product are useful benchmarks of efficiency.

Prices reported by interviewed farmers and those reported at the major local agrochemical shops were used to estimate production cost at highest possible accuracy. This procedure ensured the cross-check of the real price paid by each individual farmer to be as accurate as possible. The quantities of chemicals and other inputs used were indicated into kg and litres* 0.1 ha$^{-1}$. With this standardized information at hand, expenditures per 0.1 ha for the various inputs could be adequately computed by multiplying quantities of agrochemicals applied per hectare with the respective prices.

The costs analyses are prepared in local-currency terms using current prices of agricultural season of year 2010 were information was available for both production seasons. The study uses available price data from USAID's "Albanian Agriculture Competitiveness" project and production figures from Ministry of Agriculture Food and Consumer Protection (MoAFCP). Data accuracy has been subject of crosschecking and improvement through interviews.

## RESULTS OF THE STUDY

### Low technology greenhouse without heating

The first case is a greenhouse with low technology, which often plans a production schedule with the aim to enter in the market in shorter periods of high prices. The model includes the plantation of cucumber in the first season and tomatoes in the second season, with a yield of respectively 10,000 and 6,000 kg*0.1 $ha^{-1}$. Reports show that the achievement of two plantings per year with similar composition is the best option for having higher yields and eventually profitability (Balliu, 2006).

Table 7: Low technology greenhouse with no heating system

| GREENHOUSE 0.1 HA | | | | | | |
|---|---|---|---|---|---|---|
| ACTUAL SITUATION | | | SCENARIO | | | Change |
| Price (lek*$kg^{-1}$) | 50 | | Price (Lek*$kg^{-1}$) (C&F) | 50 | | |
| VAT | 20% | | VAT | 6% | | |
| Quantity(kg*$Ha^{-1}$) | 16,000 | | Quantity(kg*$Ha^{-1}$) | 16,000 | | |
| TOTAL COST | 511,300 | *Cost share* | TOTAL COST | 482,040 | *Cost share* | -6% |
| Input and labor | 250,000 | *49%* | Input and labor | 250,000 | *52%* | |
| Agrochemicals | 235,800 | *46%* | Agrochemicals | 208,290 | *43%* | -12% |
| Energy costs | 10,500 | *2%* | Energy costs | 10,500 | *2%* | |
| Marketing Cost | 15,000 | *3%* | Marketing Cost | 13,250 | *3%* | |
| TOTAL REVENUE | 800,000 | | TOTAL REVENUE | 800,000 | | |
| Profit before dep. int. and tax* | 288,700 | | Profit before dep.int. and tax* | 317,960 | | |
| Annual Depreciation | 50,000 | | Annual Depreciation | 50,000 | | |
| Profit before interest and tax | 238,700 | | Profit before interest and tax | 267,960 | | |
| Gross Profit Margin | 29.80% | | Gross Profit Margin | 33.50% | | 12% |

*Before depreciation, interest and taxes.
Source: Own calculations based on producer and expert assessment

Agrochemicals and fertilizers account for 46% of total costs. On average, VAT reduction on both fertilizers and agrochemicals will reduce their costs with 12%. The overall costs of the greenhouse are reduced with 6% and will increase the profitability with 12%. (See Table 7).

**Low technology greenhouse with heating**

The main challenge of vegetable producers in the first season is the early entering of plants in production and in the second season, the challenge stands on achieving a required dimension of the plant at November when the light intensity diminishes. Heating the greenhouse is an instrument of support against low temperatures during the night, thus increasing the probability of the greenhouse for achieving enduring times of sale. The increase of heating oil price has reduced the employment of heating systems. The costs have increased rapidly, compelling most farmers to maintain a low temperature (6-8 grades for a consumption of 2700 litres of heating oil). The extended production period enabled by the reduction of the temperature amplitudes in greenhouses, creates the possibility of having better annual average wholesale prices for such greenhouses at about 60 ALL*kg$^{-1}$.

From a financial point of view, greenhouses with a low technology level of agricultural activities are presented with good gross profit margin - which in this case study is at approximately 16%. The advantage of these units stands on their low establishment costs.

Table 8: Low technology greenhouse with heating (for 6 grades of minimal heating)

| GREENHOUSE 0.1 HA | | | | | | |
|---|---|---|---|---|---|---|
| ACTUAL SITUATION | | | SCENARIO | | | Change |
| Price Lek*kg$^{-1}$ | 60 | | Price Lek*kg$^{-1}$(C&F) | 60 | | |
| VAT | 20% | | VAT | 6% | | |
| Quantitykg*Ha$^{-1}$ | 19000 | | Quantity kg*ha$^{-1}$ | 19,000 | | |
| Excise | Included | | Excise | Excluded | | |
| TOTAL COST | 912,300 | Cost allocation | TOTAL COST | 727,610 | Cost allocation | -20% |
| Input and labor | 300,000 | *33%* | Input and labor | 300,000 | *41%* | |
| Agrochemicals | 235,800 | *26%* | Agrochemicals | 208,290 | *29%* | -12% |
| Energy | 361,500 | *40%* | Energy | 206,070 | *28%* | -43.00% |
| Marketing | 15,000 | *2%* | Marketing | 13,250 | *2%* | |
| TOTAL REVENUE | 1,140,000 | | TOTAL REVENUE | 1,140,000 | | |
| Profit before dep.int. and tax | 227,700 | | Profit before dep.int. and tax | 412,390 | | 81% |
| Annual Depreciation | 50,000 | | Annual Depreciation | 50,000 | | |
| Profit before interest and tax | 177,700 | | Profit before interest and tax | 362,390 | | |
| Gross Profit Margin | 15.60% | | Gross Profit Margin | 31.80% | | |

Source: Own calculations based on producer and expert assessment

The percentage of the costs of agrochemicals to total variable costs is lower in relative terms, because of the insertion of another component of the variable costs, such as the heating energy. Yield variation because of heating, increases the yield of cucumber from 10 Ton to 12 Ton 0.1 Ha$^{-1}$ and for the second season tomatoes from 6

Ton to 7 Ton* 0.1 $Ha^{-1}$.The tax interventions may reduce the costs of heating with 43% and the overall costs with 20%. The gross margin of the farmer may increase with 16 percentage points (See Table 8).

**High technology greenhouse with fuel heating (medium capacity of heating for both seasons).**

High technology greenhouses enable control of microclimate and plant growth. Tomato and cucumber greenhouses are most common greenhouse vegetables in Albania, mainly due to the higher yields they can achieve and high demand. Due to heating systems, and the controlled microclimate; they enable faster production in the spring and also extend the harvest period during the period December-February. For this reason the annual wholesale average price of such greenhouses is estimated at about 65 ALL*$kg^{-1}$if the heating system is used only for prolonging the duration of the production period, compared to 50 ALL*$kg^{-1}$of greenhouses with low technological level. Yields achieved in most newly constructed greenhouses are on average 150-160 tons*$Ha^{-1}$ during spring and at about 100-130 tons during autumn. The following case is assumed at 15 Tons 0.1 $Ha^{-1}$ for the first season and 10 Tons 0.1 $Ha^{-1}$ for the second season.

Table 9: High technology greenhouse with fuel heating (medium capacity of heating)

| GREENHOUSE 0.1 HA | | | | | | |
|---|---|---|---|---|---|---|
| ACTUAL SITUATION | | | SCENARIO | | | Change |
| Price Lek*$kg^{-1}$ | 65 | | Price lek*$kg^{-1}$(C&F) | 65 | | |
| VAT | 20% | | VAT | 6% | | |
| Quantity kg*$ha^{-1}$ | 25,000 | | Quantity kg*$ha^{-1}$ | 25,000 | | |
| Excise | Included | | Excise | Excluded | | |
| TOTAL COST | 1,318,180 | Cost allocation | TOTAL COST | 1,016,918 | Cost allocation | -23% |
| Input and labor | 442,630 | *34%* | Input and labor | 442,630 | *44%* | |
| Agrochemicals | 235,800 | *18%* | Agrochemicals | 208,290 | *20%* | -12% |
| Energy | 624,750 | *47%* | Energy | 352,748 | *35%* | -43.50% |
| Marketing | 15,000 | *1%* | Marketing | 13,250 | *1%* | |
| TOTAL REVENUE | 1,625,000 | | TOTAL REVENUE | 1,625,000 | | |
| Profit before dep.int. and tax | 306,820 | | Profit before depint and tax | 608,083 | | 98% |
| Annual Depreciation | 250,000 | | Annual Depreciation | 250,000 | | |
| Profit before interest and tax | 56,820 | | Profit before interest and tax | 358,083 | | |
| Gross Profit Margin | 3.50% | | Gross Profit Margin | 22.00% | | |

Source: Own calculations based on producer and expert assessment

Construction of high-tech greenhouses is a massive investment and therefore requires a high cash flow to overpass the yearly costs. Therefore the depreciation rate is high

because of the high costs for the establishment of the greenhouses. Greenhouses with high technological level also have a much higher cost of annual operating expenses. The heating oil used in lower level compared with the normal capacity used for the first season and 1/3 of the normal capacity used for the second season (in total 4,700 liters of heating oil). The costs of heating oil represent approximately 47% of the overall costs, while the workforce and raw material, approximately 40% of the total costs. At present conditions, net profit is about 360,000 ALL*0.1 $Ha^{-1}$. It is expected that net profit may increase with 17.5% points if excises exemption and VAT reduction with 14% on heating oil are applied (see Table 9)

### High technology greenhouse with full heating capacity

The level of heating oil quantity is nowadays a technological normal indicator as a full use of the heating oil is very costly. In case of full use of the heating system, heating oil costs (around 1,274,000 ALL or 9,800 litres) and payments to the workforce (around 280,000 ALL) are the most important expenses. If the entire capacity of heating system is used, the costs of the fuel quantity will generate a net annual loss of 407,930 thousand ALL for the entire year. In such terms the farmer may decide to use the heating system with low capacity or operate the high technological greenhouse as the ordinary non heating greenhouses.

Table 10: High technology greenhouse with fuel heating (full capacity of heating)

| GREENHOUSE 0.1 HA | | | | | | |
|---|---|---|---|---|---|---|
| Actual situation | | | Scenario | | | Change |
| Price Lek*kg$^{-1}$ | 70 | | Price Lek*kg$^{-1}$ | 70 | | |
| VAT | 20% | | VAT | 6% | | |
| Quantity kg*ha$^{-1}$ | 26,000 | | Quantity kg*ha$^{-1}$ | 26,000 | | |
| Excise | Included | | Excise | Excluded | | |
| TOTAL COST | 1,977,930 | Cost allocation | TOTAL COST | 1,384,517 | Cost allocation | -30% |
| Input and labor | 442,630 | *22%* | Input and labor | 442,630 | *32%* | |
| Agrochemicals | 235,800 | *12%* | Agrochemicals | 208,290 | *15%* | -12% |
| Energy | 1,284,500 | *65%* | Energy | 720,347 | *52%* | -43.90% |
| Marketing | 15,000 | *1%* | Marketing | 13,250 | *1%* | |
| TOTAL REVENUE | 1,820,000 | | TOTAL REVENUE | 1,820,000 | | |
| Profit before dep.int. and tax | -157,930 | | Profit before dep.int. and tax | 435,483 | | |
| Annual Depreciation | 250,000 | | Annual Depreciation | 250,000 | | |
| Profit before interest and tax | -407,930 | | Profit before interest and tax | 185,483 | | |
| Gross Profit Margin | -22.40% | | Gross Profit Margin | 10.20% | | |

Source: Own calculations based on producer and expert assessment

The situation improves in the supposed case of tax exemptions for heating oil and inputs. As a result of the reduction of VAT and the exemption from the excises the costs of the fuel reduce by 44%. These measures, together with other interventions on agrochemical VAT and packaging excise, may return the gross margin from negative to positive ones, generating a net profit of 185,483 ALL *0.1ha$^{-1}$ and achieving a gross profit margin of 10.2% (see Table 10).

The reduction of VAT with 14% points and the exemption from the excises of the heating oil would reduce the cost of heating by 44% and reduction of 12% in cost for the agrochemicals.

## DISCUSSIONS AND IMPLICATIONS

The resulting impact on overall costs a gross margin depends on the cost structure and therefore the technology applied (see Table 7). In the case of greenhouses with low technology the agrochemicals inputs make up 50% of total costs, implying a cost reduction of 6 percent. The situation changes dramatically in case of greenhouses with heating. For heated greenhouses, the costs are reduced by 20 to 30%, respectively to low and high technology greenhouses. At low technology greenhouses, heating oil used for heating represents 30% of the overall costs. Therefore, the gross margin is doubled by a reduction of the tax burden. In case of high technology greenhouse with medium use of heating capacity the increase of gross profit represents even 18.5% points. The case of high technology greenhouse with full use of heating capacity represents the dilemma of Albanian farmers, as they cannot use this strategy. In case of full use of heating capacity, they will produces losses equal to a negative gross margin of more than a fifth. Meanwhile under the proposed strategy, they could run again this strategy with a positive gross margin of 10%, however still lower compared to the medium capacity approach.

Table 11: Impact of tax exemption or reduction in costs and gross margins for the greenhouses by technology level

| | *Low Tech* | | *High Tech* | |
|---|---|---|---|---|
| Heating | No | Yes | Medium | Full |
| Overall costs | -6% | -20% | -23% | -30% |
| Gross Profit margin Actual level | 30% | 15.6% | 3.5% | -22.4% |
| Gross Profit margin Expected | 33.5% | 31.8% | 22% | 10.2% |

Source: Own calculations based on producer and expert assessment

Despite this positive influence in the performance of the greenhouse producers the Albanian state may “loose” 0.87 Million ALL if the excise on imports of heating oil is exempted. Also a step back of the government on the excises of the heavy oil from 40 to 0 ALL reduce the revenues up to 8.2 Billion ALL, with the assumption that all

heating oil goes for agriculture. Taking into consideration a proxy of the share of the agriculture use to fuel energy (10% of the total fuel energy produced) and assuming that this share remains the same for heating oil it can be supposed the excise deferred for agriculture will be approximately 800 Million ALL. On regards to agrochemicals the state budget may lose approximately 420 Million ALL if a VAT 6% tax rates prevail on agrochemicals and additional1 Million ALL if the excise on the agrochemicals packaging is not applied.

Tax exemption or reductions influences more directly and extensively the farmers the employment and consumers. This is a larger effect compared to the agriculture support measures which have partial impact and may fluctuate based on restrictive budgetary policies. The financial burden of taxes is quickly transferred to the farmers. A reduction of VAT in agrochemicals would positively influence about 80% of all Albanian farms. Every fiscal release, assuming non-opportunistic behaviour of wholesalers, would reduce the input prices at farm level. The price elasticity of the input use, based on other studies made to farms in developing countries, show a 0.8-1.3 interval (Agne et al, 2000), what means that a reduction of prices would increase the quantity demanded with approximately the same percentage.

Regarding protected crops, calculations show a potential of substituting 85% of the tomatoes imports in January and 65%-75% of cucumber imports in December. Such substitutions correspond to a value of 1.35 Million USD.

In the greenhouse sector the reduction on costs may boost employment. There are approximately 5,000 greenhouse farms in Albania that employ at least 10,000 (mostly self-employed) people (assuming at least 2 people working full time* greenhouse$^{-1}$). A reduction in input costs would increase the protected area planted with vegetables with more than 100 ha*year$^{-1}$what means a more than 15% increase in surface. This may lead to an increase of revenues per working day, but also an increase of number of working days assuming that there is higher demand for work related to harvesting and land preparation.

Finally there should be also a positive effect on consumers- Consumer prices would be positively affected to a great extent if the abovementioned proposals would take place – lower production costs would results in lower prices. Taking into consideration the high price index and the high level of food consumption to the overall household budget, a VAT reduction on inputs and excise reimbursement for energy would reduce farm prices would affect the poor population consumption patterns and would create positive spillovers in the economy.

## CONCLUSIONS

For agriculture, altering the VAT on inputs is expected to have a strong impact. These study results suggest that the competitiveness of vegetable production in Albania would be substantially enhanced by an input VAT tax reduction, and by a reduction of the costs of fuel through excises exemption or reimbursement. The VAT reduction and excise exemption is very important for greenhouses. Agrochemicals inputs, which are subject of the VAT, make up 50% of total costs, in cases of greenhouses with low technology, to 15% of the overall costs in cases of high technology greenhouse performance.

On low technology greenhouses with heating the heating oil used make up equally 30% of the overall costs. The excise on heating oil used for heating, adding here the

VAT on final price of the heating oil, increases the costs by 36%. The same happens for a high technology greenhouse with medium use of heating capacity.

The study finds that on the most conservative basis, with a VAT reduction on agrochemicals and heating oil, combined with excise exemption of heating oil, would increase gross margins by more than 12 point percentage, for non-heating greenhouses, and with more than 20 points percentage in for heating greenhouses, assuming fix output prices. In this second case, other positive spillovers may arise such as the increase of employment, import substitution and assuming strong competitive forces as a result of self-sufficiency also reduction of prices.

The respective Albanian institutions may consider to prioritize on general relief of taxes, excises, duties, tariffs, etc. that benefit a higher percentage of stakeholders including consumers rather than the direct farmers support (although both are important). In this context the government should review the policies and monitoring systems for energy inputs for heating greenhouses. Taking into consideration donor funding contraction, decrease of remittances flows and increased public debt, the government is reluctant to reduce taxation unless other ways for tax substitution are foreseen. Therefore, the Government of Albania should increase the efforts to introduce the VAT in a wider base of farms through the fiscal identification of their activities. The VAT on farm output has to be defined in the same level recommended for inputs, in order to ensure an equal effect along the chain. The government should consider exempting the excise on packaging and heating oil used for agriculture. The excise exemption has to be addressed as far as actual scheme of disbursement is not taking place.

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