The growing of vegetables, one of the strategic possibility of the Hungarian agricultural improvement

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SUMMARY FINDINGS, CONCLUSIONS, RECOMMENDATIONS

The development of market-gardening can be one of the hopeful possibilities of the agriculture; the function is still competitive but its competitiveness is decreasing. It is national, consumer and economic interest to improve the sector as the unemployment in the countryside can also be reduced.

During the producing we must attach the importance to the quality as in the EU only that farmer can suit the requirements who can usually deliver reliable quality product. The sector is deficient in funds, so the technical, innovative and logistic improvement hung behind the requests. This fact has to be changed.

Our advantageous conditions open the door to increase production output and to use the logistic possibilities thanked to our geographical location. An entire improving packet is needed to the development, creating the industrial background, increasing the internal consumption, producing organic food, specialities, traditional Hungarian products, taking the advantage of market gaps, organization, improvement of logistic and marketing work, spreading of watering and thermal water heating, stressed preferring of works related to search and technical advice are necessary. There is no result without producers' collaboration. Watering is essential by market-gardening; the watered area has to be doubled.

According to our research the vegetable forcing can have good results if use of heating based on thermal water or biomass.

INTRODUCTION

The gardening branches play important roles in the producing system of Hungarian agriculture. The ground vegetables were grown in 2007 on 83 000 hectare and 5.7 thousand hectare was the forcing area. The extreme environmental conditions influence the average invested claims stronger by these plants. The different technologies and types result significant differences within the costs of the branches, too. The market-gardening is important in the population's employment, income in the countryside. The vegetables' net exporter role still exists in spite of the fact the import has grown.

The market-gardening struggles with technological lacks in many places, only one-third of the area can be irrigated. The watered area should be increased for double for the sake of proving the quantity and quality. The strengthen and development of the Producing-Selling Co-operation is essential for disposing. Half of the vegetable growing goes to the processing in-

dustry, it is also important to increase the rate and to develop the industrial background in the future. Hungary's great chance to use geothermical energy for forcing vegetables professionally and in an environmentally sound way.

Beside the qualitative producing, the agricultural producing (energy-plantation) is also significant and the technological methods are also changing, which determine the using of our agricultural resources (ground, work, stock) (*Szűcs, 2005*).

In some areas among alternate resources biomass can also be applied for heating greenhouses.

THE MARKET-GARDENING'S POSITION IN HUNGARY

Kerek et al. (2008/a) says vegetables grown on the plough-land can be integrated into the saw system of the cultivation. The cereals grown on the biggest area are generally good green crops, the most vegetables claim watering, their growing are mainly advantageous where fitted areas can be found. Most of the machines, equipments (cultivation, nutriment substitution, plant protection) using in field growing of plants can also be applied, hereby the machines, equipments and capacity will be better.

Erdész (2008) thinks that water in a bigger area is one of the key of the section improvement. The present 25-30% of watered area should be increased for 80-85%. The actual economic conditions make possible watering for plants providing high production value in a hectare. For example: seed-grain corn, which can be replaced with watered producing of green peas, green beans, onion, sweet corn. Watering is needed for highly safe production, and for the reduction of quantitative and qualitative crop fluctuation disarranging the market.

Csáki (2008) says in agro-economy the extensive shifting of production structure the low income providing ability are extremely harmful. The watered vegetables projected on one hectare show considerable production values. The agricultural work – as the only source of living – is appreciated in the critical economic regions.

The task is to think over the role of intensive cultures with the purpose of increasing of employment and production value. The growing of vegetable and fruit belongs to it (*Bene – Marselek, 2008*).

The market economy experiences of the past period proved that the domestic vegetable section is needed in sharpening market competition with a changed merchandise construction. The role of the vegetable section has been appreciated because of our conditions, and it has assigned new opportunities, priorities within agroproducing. Table 1 shows the vegetables' purchasing position in comparison with other agricultural products.

Table 1

Procurement-indices of agricultural products

Product	2003	2004	2005	2006	2007*)
	2000 = 100.0				
Crops and horticultural products	124.5	144.8	131.6	116.3	109.9
Cereals	111.3	133.9	125.7	121.9	98.0
Vegetables	181.8	144.7	133.6	128.3	146.2
Fruits a)	114.6	118.5	67.8	75.8	60.6
Live animals and animal products	109.4	98.1	92.4	90.7	97.2
Agricultural Product, total	115.2	115.5	106.7	99.7	101.2

*) Forehand data

a) From 2003 include wine grape

Source: CSO

The improvement of market-growing is necessary – the researches prove this fact. According to Medina's scientific investigations we have comparative profit by the fresh and processed vegetables looking at the foreign trade into the countries. But analyzing the tendencies we can see that the advantage is continually decreasing. (The comparative advantage compares the commercial balance to GDP, so the role of the economic activity can be realized and which the determined branch is.) The market-gardening's development and division can be seen in Table 2.

Table 2

Establishment of the vegetable production and its distribution

Name	2003	2004	2005	2006	2007	Average '00-'06	Diff. '07/'06	Diff. '07/ average
	thousand tons						%	
Outdoor vegetables	1 615.1	1 475.3	1 062.5	1 277.8	1 310.8	1 353.3	2.6	-3.1
Forced vegetables	450.6	436.7	398.8	408.6	439.8	442.9	7.6	-0.7
Grown fungus	32.0	29.0	22.9	21.6	20.9	31.3	-2.8	-33.2
Forced vegetables and mushroom	482.6	465.7	421.7	430.2	460.7	474.3	7.1	-2.9
Other vegetables	11.4	12.3	9.7	11.9	12.0	10.9	0.8	10.4
Vegetables total	**2 097.7**	**1 941.0**	**1 484.1**	**1 788.0**	**1 771.5**	**1 827.5**	**3.7**	**-3.1**

Source: National strategy to the sustainable functional program, 2008

The production in the past ten years has not change significantly, the economic organisations' production has grown and the consumption has decreased determinately from the own production (Table 3).

Table 3

Market-gardening by the economic organisations and individual farms

Unit: thousand tons

Organization	2000	Average of 2001-2005	2006	2007
Agricultural enterprises	311	446	432	528
Private holdings	1 189	1 401	1 347	884
Of which:				
production	798	1 077	1 172	750
consumption	366	236	131	103
Unidentifiable with holdings	-	-	-	348
Production total	**1 500**	**1 846**	**1 779**	**1 760**

Source: Hungarian Statistic Annual, 2007

Examining all of the crop quantities of the main vegetable plants in the case of the single vegetable races more serious temporal changes can be already reali-

zed. The harvested quantity of Hungarian red paprika, onion, carrot, cucumber and cabbage has decreased significantly, while yield of the watermelon, green peas, sweet corn and green pepper has grown (Table 4).

Table 4

Total production of main crops

(Unit:thousand tons)

Crop	2000	Average of 2001-2005	2006	2007	Of which:		
					Agricultural enterprises	Private holdings	Unidentifiable with holdings
Vegetables	1 500	1 846	1 779	1 760	528	884	348
Of which:							
sweet corn	291	462	513	535	304	136	95
tomato	203	244	205	228	75	133	20
green paprika	96	92	175	191	8	98	85
watermelon	133	198	165	164	6	128	30
green peas in grain weight	61	92	92	93	62	22	9
carrot	89	94	84	78	8	60	10
white cabbage	120	152	78	73	3	52	18
onion	117	120	95	69	11	44	14
cucumber	103	89	71	52	4	34	14
parsley root	34	39	47	41	2	32	7
green beans	27	25	22	23	12	9	2
Hungarian red paprika	40	51	33	14	3	7	4

Source: Hungarian Statistic Annual, 2007

The average yield of the main vegetable plants has increased in comparison with the average of the years of 2001-2005. In 2007 the economic organisations were leading in this area (Table 5).

Table 5

Average yields of main crops

(Unit: kg/ha)

Crop	2000	Average of 2001-2005	2006	2007	Of which:		
					Agricultural enterprises	Private holdings	Unidentifiable with holdings
Vegetables							
sweet corn	12 250	14 110	15 260	14 650	15 190	12 790	15 620
tomato	23 330	32 710	50 690	45 510	52 600	41 060	29 390
green paprika	12 340	13 200	21 590	11 490	25 190	13 130	6 850
watermelon	15 950	18 950	23 820	20 440	20 030	24 740	11 840
green peas in grain weight	3 240	4 510	5 290	4 820	5 010	4 410	4 400
carrot	20 300	22 640	21 240	22 430	41 380	21 440	16 450
white cabbage	20 050	23 590	28 280	24 340	24 020	25 110	22 840
onion	18 690	22 110	21 180	23 610	19 170	25 540	23 330
cucumber	16 970	23 610	47 070	25 000	40 080	29 300	19 930
parsley root	9 850	11 090	10 780	12 430	11 700	12 450	12 910
green beans	5 470	5 770	6 990	6 760	6 880	7 080	4 850
Hungarian red paprika	6 800	8 380	7 240	5 760	6 080	6 150	5 050

Source: Hungarian Statistic Annual, 2007

OUR RESEARCHES ABOUT THE CIRCUMSTANCE OF GROWING

Within the gardening the market-gardening can have a great role in the future in the unemployment of people living in the countryside. According to Hungary's ecological conditions farms in the southern lowland region can have determinant role. The capable and good ecological farms' Standard Collateral Subsidy (SCS) can be increased with the heating costs' decreasing within the capable costs.

During our work the data of the model farm in the southern lowland region were basic by the cost calculation – the heating was proved with coals (in the case of tomato), and with thermal water (in the case of paprika and cucumber).

We made investigations for the budget and income condition of three vegetables – paprika, tomato and cucumber..

We realized that we could only look at the costs with exact data collection; the results cannot be generalized, but can give real facts about the ecological conditions of vegetable forcing. The transplanting by the forced vegetables was at the beginning of December (long term growing) and until the end of October good yield could be realized. The condition is proper sized cultivating equipments which gives 4-4.5 metres throating height in plastic – and glasshouses. The cost calculation refers to the using of hidrocultural growing technology in heating conditions. We strived to separate the variable and constant costs by the costs' division as the later used measurement can be counted.

During our research we also tried to find answer in which category the 1 hectare farms could be graduated. We got complete information about the present conditions of forcing using our data of the traditional, ground cultivating model farms without heating. Table 6 indicates the results.

Table 6

Economical analyzing of the 1 hectare farms' results

Name		Paprika forcing	Tomato forcing	Cucumber forcing
Hidrocultural growing (heated)	Production value (€)	250 560	347 340	278 400
	Changing cost (€)	146 580	217 854	156 759
	SCS (€)	130 980	129 486	121 631
	EUME	109.15	107.90	101.35
Traditional ground growing (without heating)	Production value (€)	63 040	78 000	64 800
	Changing cost (€)	23 120	35 080	31 760
	SCS (€)	39 920	42 920	33 040
	EUME	33.26	35.76	27.53

Source: Tégla – Marselek, 2007

The research prove that by the hidrocultural growing in heated conditions all of the three 1 hectare farms are small, but according to the EU's rules they are quite big (101.35-109.15 EUME) In the case of growing without heating, on the ground, the same farms show 27.53-33.26 EUME, but they are still in the big –medium category.

On the studied farms the heating costs of the greenhouses heated with thermal

water was 60% lower than heated with coals. The good geographical location motivates us to grasp the opportunity and use the energy from the ground. Nowadays using the waste-heat of power stations heated by biogas or biomass we can have significant saving in costs. 0.5-1 hectare forcing equipments' heating could be solved by using the alternative heat of 1-1.5 MW power stations, which means 50-100 EUME, and it suits as a large farm according to the EU's classification.

The researches also support that during vegetable forcing on unit area we produce large value, we employ significant workforce and the products can be disposed. This fact proves the development of the vegetable sector is necessary.

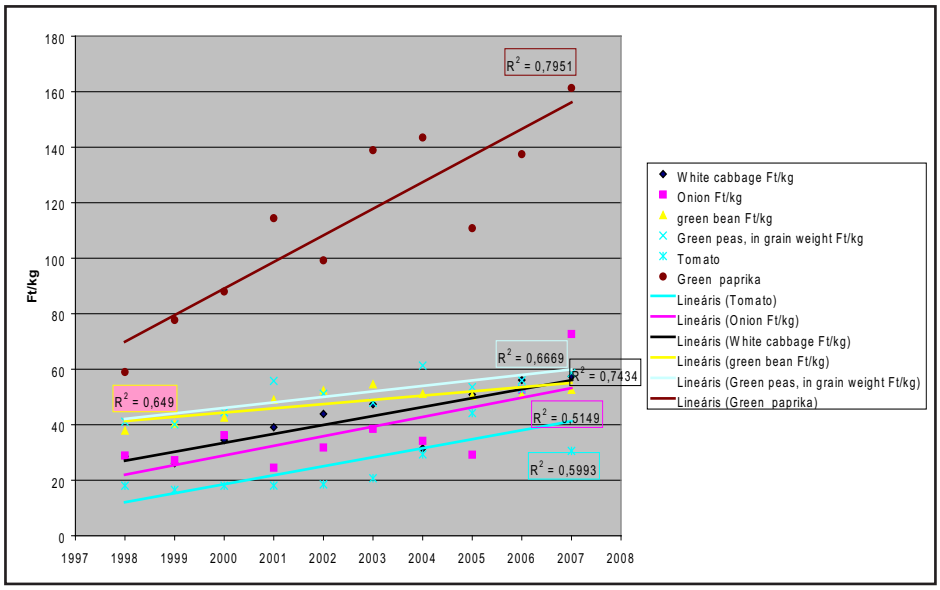
MARKET FEATURES

Csáki (2007) explains that "Instead of the traditional quantity centric the market production and income centric become important. The factors of the production can be successful only in the total food chain. While the production is integrated to the system of capital goods. The traditional human work in the agriculture also changes. In the production instead of physical force the human work becomes the factor of organising and managing the producing. The qualitative side of the human factor will be significant. The decisions will adjust to the market, the farms' cultivation will specialize, it will be accompanied with the productions' diversification in regional level."

The expenses of the section have grown drastically in the past period, the increase of the buy-up price has been more moderate. The less cost-effective economies yielded that minimal profit or loss was raced by some vegetables in 2007. Figure 1 demonstrates the change of the buy-up average price of the main crops.

Figure 1

The average buy-up price of main corps



Source: Agricultural Statistic Annual, CSO, 2002, 2005

Béládi – Kertész (2007) say that based on the production cost category grouped data can be related, that by the cost-effective economies the prices implied incomes in some sections. Opposite this in the centre through the prices the tomato, paprika and sweet corn producers had already loss in 2006. In the less cost-effective category though, only the green pepper and cabbage prices offered coverage for the expenses, while the rest of the sections had loss (Table 7).

Table 7

The income content of the vegetable products by production cost category
(average of market defining economies)

(Unit: Ft/t)

Section	2005			2006		
	Better than production cost center	Production cost center	Worst than production cost center	Better than production cost center	Production cost center	Worst than production cost center
Green peas	11 920	1 734	-4 051	3 174	8 564	-17 501
Tomato	- 1 321	2 630	15 818	7 427	-2 935	-4 901
Green paprika	38 793	31 296	20 050	32 895	5 831	15 086
Hungarian red paprika	18 641	6 479	-22 663	13 746	-12 523	-4 292
White cabbage	7 967	26 377	4 057	7 763	14 356	23 212
Sweet corn	8 897	5 472	-5 273	6 833	-280	-2 898

Source: AKI, 2007

Deme (2005) says that we have to use the opportunities of technology and species. The modern species and hybrids can have huge yield but only in that case if the specifications of the technology, and the nutriment are provided and lack of rain is retrieved with watering.

The world's market-gardening and ingestion are growing dynamically. China gave 435 million tons, India gave 86 million tons and the USA shared 37 million tons in the world's 900 million tons production in 2006.

Hungary thanked to its circumstances can grow its 1.8 million tons production and contribute to satisfy the needs *(Popp - Potori, 2005)*. The vegetable consumption of Hungary is increasing; Table 8 shows the data.

Table 8

Consumption of vegetables, fruit and greens
(average amount for one person, kg)

Food	2000	2004	2005	2006
Vegetables, greens	109.2	117.7	112.1	119.9
Fruit	108.5	93.7	82.7	90.7

Source: Hungarian Statistic Annual, 2007

The regional analysis of the market-gardening searching the quantity of the production shows overweight of Northern and South Great Plain. The two region give 80% of Hungary's market-gardening (*Marselek – Bene, 2008*).

Significant changes have happened for the last years at the vegetable market. The earlier 60:40% of processed and fresh market rate has changed, the customers look for fresh products more and more. The data of sectorial balance of goods – valuing the fruit branch – prove this tendency (Table 9).

Table 9

Vegetables-fruit section merchandise balance 2006

1 000 tons	Fresh	Preserved	Freeze	Dried	Total	%
Import product	384.9	168.4	24.7	17.5	595.5	33.2
Domestic product	768.6	181.3	39.2	3.1	992.2	55.3
Claim of raw material of domestic merchandise	832.7	309.4	68.5	21.6	1 232.2	48.8
Domestic consumption	1 153.5	349.7	63.9	20.6	1 587.7	88.5
Export product	257.7	429.2	99.0	15.8	801.6	44.7
Claim of raw material of export merchandise	279.2	732.4	173.0	110.1	1 294.7	51.2
Merchandise making loss	85.6	431.3	103.4	112.8	733.1	29.0
Total domestic product	1 026.3	610.5	138.2	18.9	1 793.8	100.0
Total domestic raw material	1 111.9	1 041.8	241.5	131.7	2 526.9	100.0
Distribution of domestic raw material	44.0%	41.2%	9.6%	5.2%	100%	

Source: National strategy to the sustainable functional program, 2008

Growing of vegetables is essential according to export, providing the consumption, the processing industry and the employment. Growing of vegetables has other industrial advantages

- several working process can be mechanized;
- it can prove early return of sales;
- freshly and prepared the export can be significant;
- the green peas can enrich the ground's nutriment with nitrogen (100-120 kg/ha agents);
- it can prove employment for the locals;
- they can be adjusted to the crop rotation;
- comparatively high return of sales can be reached.

THE ROLE OF PRODUCING-SELLING CO-OPERATIONS AND PRODUCTION GROUPS

Erdész (2007) says that organising of vertical integration, common provision and sales, the effective marketing work are important to increase the competitiveness. Maximum providing of food safety is essential, its control is continuous task.

It is important to establish producers' union, producers' organisation for common liquidation. The producing co-operations and groups' total sales are under 20% of the total outlet the increasing is essential. Table 10 showes the changes.

Table 10

Members of fruit-vegetables producing-selling co-operations and producing groups

	2003	2004	2005	2006	2007
Number of PSC and PG (piece)	69	101	77	64	58
Number of PSC (piece)	1	8	7	7	9
Covered area (ha)	25 139	25 640	26 122	29 550	34 982
Total members of PSC and PG	13 450	23 980	20 514	20 494	20 177
Average members of PSC and PG	195	237	266	320	348

Source: National strategy to the sustainable functional program, 2008

The cooperation progresses drawling unfortunately in our homeland. A motivation, an association inclination and confidence are needed for the cooperation. The social capital is attached to this.

Putman (1993) says that the social capital refers to the features of the social organisation, networks, standards and confidence, which promote the cooperation in order that we can be better off with it. This mentality cannot be really found in the Hungarian society, which is pitiable because the branch economy's period has set in nowadays (*Lengyel, 2003*).

The rigid verge increasingly disappears between macro- and microeconomics' ideas, the company is not a separated organisation nowadays (because of networks, clusters, strategical unions, etc.), it is interpreted in its local business environment (*Abayné et al., 2005*).

In the new international division of labour the technical achievement, infrastructure, access to the science and the high qualified workforce become the main source of competitiveness.

By the Hungarian market-gardening it is worth taking these thoughts to heart. New division of labour is coming into existence with the establishment of clusters, networks. The new division of labour can be understood more if we approach it with a three-dimensional typology. The first dimension is the actual task's, which has to be done in a proper working process, the second one is the dimension of the relationship of proper corporation and its environment, including other co-operations, the third dimension covers the relationship of the leaders and employees in a proper co-operation or network. The first dimension is the establishment of the value, the second one is the establishment of the connection, the third one is the decision.

It is necessary to increase the trade of producers' co-operations until 2013, we fancy 40% of vegetable-fruit commerce with these co-operations' trade, as marketable co-operations.

Marselek (2003) analyses the role of quality. Producing of the qualitative and safety consumption agro-goods in the food industry is the precondition of the future competitiveness. It is close connection with profitability, too, as with better quality larger market share and higher prices can be reached. It can also affect to the costs, as it can cost a lot of money to the quality and to pay for the mistakes. Hungary does not improve the agriculture's opportunities.

The European Committee's vegetable and fruit reform came into force at the beginning of 2008 and its main aim to draw the vegetable and fruit sector to the paying system based on the area and to terminate price support. The regulation also affects the subsidy's separation from the

production. According to *Erdész (2008)* the further aim is to increase the sector's market orientation and competitiveness, to decrease the growers' income instability and to solve market crisis. Beside this fact the reform also supports the establishment and operation of producers' marketing organisations and treats with the environmental protection and with the popularization of vegetable and fruit consumption.'

ECONOMIC-POLITICAL OPPORTUNITIES, TASKS

The developing world – more hundred million middle class – present itself at the market of fruit, vegetables and animal products. By these consumers the consumption of vegetables and milk has doubled in 20 years. The markets' changing converts the production, too.

Csáki (2007) explains that "Instead of the traditional quantity centric the market production and income centric become important. The factors of the production can be successful only in the total food chain. While the production is integrated to the system of capital goods. The traditional human work in the agriculture also changes. In the production instead of physical force the human work becomes the factor of organising and managing the producing. The qualitative side of the human factor will be significant. The decisions will adjust to the market, the farms' cultivation will specialize, it will be accompanied with the productions' diversification in regional level."

Meeting the market claims, the technologies providing development are only possible with agro-production making innovation. The innovation is successful if its results are carried out at the market, and the production's competitiveness increases.

In the society based on knowledge the innovation is effective if it does not base only on the institutions' – enterprises, universities, research laboratories – works but it also pays attention to the collaboration of the elements of the system. It is a basic requirement that the state organises the economy. The national economies' implements affecting to the economy are shown in Fig. 2.

It is necessary to work out an expert task connecting to the producing organisation or agro-chamber – which can refer to the universities – in order that the investments and developments will be established with proper professional background.

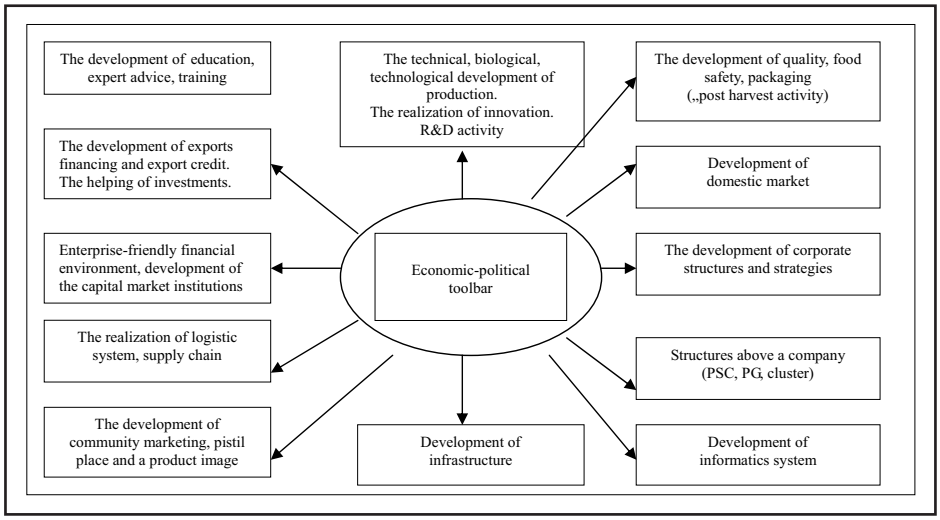
Because of the sector's scarcity of capital the technical, innovative and logistical improvement must be developed. The ruin of the competitiveness has to be stopped; this claims reasoned achievement. For this fact the main development sections can be the following

- the special qualities' disposal as traditional Hungarian products;
- integrated and environment – friendly cultivating technologies' popularization;
- development of foil forcing using the heating of thermal water and biomass power stations;
- realizing economical watering;
- development of 'post harvest' work.

The producers' union, the vertical integration, realizing the common supply and liquidation, developing the marketing task establish the developmental opportunity in the future.

Figure 2

The economic-political toolbar of the competitive production



Source: Kerek et al. (2008/b)

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