Vegetable forcing program in Hungary, and its employment aspects

GERGELY, SÁNDOR

Keywords: vegetable forcing, vegetable export and import, employment of unemployed people, green energy, integration.

SUMMARY FINDINGS, CONCLUSIONS, RECOMMENDATIONS

Hungary is one of the countries best suited for agriculture in Europe and throughout the world. Over the last decades, however, the emphasis on putting such natural endowments to the benefit of the nation and of rural communities has dwindled. Most of the opportunities lost concern vegetable and fruit growing, as well as animal husbandry. This also means that these are the fields where we have the greatest reserves. No country may reach the level of prosperity to which it destined without using its natural and human resources in a sustainable manner. Our paper presents the main trends in vegetable growing in the world, the Community and in Hungary, as well as characteristics of the export and import of vegetables in the country. We present development scenarios in the field of vegetable forcing in greenhouse, covering program versions of 1000, 2000 or 3000 ha. We also present the investment and operational features of development scenarios, their budgetary effects, as well as how implementing such scenarios would/could improve employments rates, particularly in underdeveloped micro-regions characterised by high rates of unemployment. We present proposals on how producers could act together in the field of vegetable forcing and marketing.

VEGETABLE PRODUCTION OF THE WORLD AND EUROPEAN UNION

Vegetable production of the world and its expected development is characterised by the fact that it was increased by 93.5% from 1990 to 2007. In accordance with the prognosis of Kartali (2005) the increase of world vegetable production will be 145.9% from 1990 to 2014 (Table 1).

The largest vegetable producer of the European Union is Italy with 15.2 million tons, it is followed by Spain with 12.1 million tons and by France with 8.6 million tons. Among the small countries the Netherlands is outstanding with 3.8 million tons. We can mention — characterising the Hungarian situation— that harvest changes of 30-50% are not rare between the given years due to lack of irrigation. Share of Hungarian production is between 2.4 and 3.6% in the European Union and this ratio can be increased to around 6-7% by realisation of the Vegetable Program.

VEGETABLE PRODUCTION OF HUNGARY

It is seen clearly in the Table 2 that how the cultivation divisions utilising the growing land with high revenue have been forced back from the beginnings of 1990s. It is not regular at all that this trend will have to be continued only causing disadvantages to the nation. However, turning this trend cannot be solved without program based on a wide-scale strategy. The Vegetable Program wishes to be this one.
Table 1

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<td>812 257</td>
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<td>423 262</td>
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<td>522 648</td>
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<td>86 975</td>
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<td>75 934</td>
<td>72 345</td>
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<td>East-and SE-Asia</td>
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<td>43 056</td>
<td>44 781</td>
<td>46 821</td>
<td>48 115</td>
<td>50 185</td>
<td>52 061</td>
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<td>South America</td>
<td>23 133</td>
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<td>19 081</td>
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<td>54 184</td>
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*EU-25
Source: FAO, and Kartali' prognosis, 2005

Table 2

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<td>4 299</td>
<td>5 186</td>
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<td>6 261</td>
<td>4 394</td>
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<td>507</td>
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<td>224</td>
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<td>3 979</td>
<td>4 461</td>
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<td>1 774</td>
<td>1 846</td>
<td>1 602</td>
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<tr>
<td>Fruits</td>
<td>3 010</td>
<td>676</td>
<td>955</td>
<td>1 218</td>
<td>1 379</td>
<td>1 510</td>
<td>1 731</td>
<td>1 629</td>
<td>1 090</td>
<td>867</td>
<td>822</td>
<td>591</td>
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<td>Grape</td>
<td>495</td>
<td>510</td>
<td>646</td>
<td>775</td>
<td>822</td>
<td>837</td>
<td>784</td>
<td>676</td>
<td>637</td>
<td>632</td>
<td>532</td>
<td></td>
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<tr>
<td>Vegetable, fruit, grape total</td>
<td>3 010</td>
<td>676</td>
<td>955</td>
<td>1 218</td>
<td>1 379</td>
<td>1 510</td>
<td>1 731</td>
<td>1 629</td>
<td>1 090</td>
<td>867</td>
<td>822</td>
<td>591</td>
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</tbody>
</table>

*1938 figure
Source: Oroz – Fűr – Romány, 1996 and KSH
Current volume and structure of our forced vegetable production are presented on the base of a table elaborated by Hungarian Product Council of Vegetable and Fruit (Table 3).

**Table 3**

<table>
<thead>
<tr>
<th>Culture</th>
<th>Land (ha) year</th>
<th>Production (1000 t) year</th>
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</thead>
<tbody>
<tr>
<td>Mushrooms</td>
<td>8–0</td>
<td>50–50–50–50–50–50–50–50–50–50</td>
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</table>

Source: Hungarian Product Council of Vegetable and Fruit, 2003

In the greenhouses and foiled facilities continuously operated all the year round the presence of eating paprika, tomato and cucumber is dominant in Hungary. From the 5,270–5,300 ha meaning the total forcing area the eating paprika, tomato and cucumber occupy together 4,000–4,200 ha.

Outstanding plant of the Hungarian vegetable forcing is eating paprika. In the area of about 2,300–2,400 ha the annually production is 160–180 thousand tons. It means 46% of the total domestic forcing area and about 42% of total production.

Paprika is followed by tomato in forcing – considering both the growing area and production volume. About 100 thousand tons are produced from it in the area of 1,100 ha. The presence of LSL species containing RIN gene and having long shelf time is dominant in the use of species.

Cucumber is third plant of the Hungarian vegetable forcing, but it is declining regarding both the growing area and production volume. Currently it is produced in the area of 5–600 ha and production volume is 80–90 thousand tons.

The Hungarian forced Vegetable Program has special significance because it means permanent earning opportunity to less educated population groups, while it contributes to rising of sub-regions of disadvantageous situation, which are dropping to the rear. The fewest foreign capital arrived in the most important regions in term of the Vegetable Program, these are South-Transdanubia, North-Plain and South-Plain.

Besides the above-mentioned regions also the North-Hungarian one can be said as the area of the Vegetable Program realisation, because there are vegetable growing areas with great traditions in its southern area, for example Hatvan-Bol- dog, Heves.

In a lifetime the ration of agricultural active earners declined from 51.5% to 10% and in parallel the total population falling
to one agricultural earner inclined from 4 to 33. It is a severe lesson that the active earning population of about 5.1 million in 1975 became fewer by more than one million to 2005, which reflects on the one hand the intolerable situation of employment and on the other hand it proves that the Country did not excel at all in the international competition of past 20 years.

Vegetable export of Hungary has increased from a low basis during the examined five years, but currency gaining effect of this increase was significantly reduced by vegetable import inclined to 3.1 times (Table 4).

### Table 4

Role of vegetable export and vegetable import in the agrarian foreign trading of Hungary (2000-2007)

(Units: million USD)

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<tbody>
<tr>
<td>Agrarian export</td>
<td>2,256</td>
<td>2,544</td>
<td>2,668</td>
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<td>3,856</td>
<td>3,892</td>
<td>4,623</td>
<td>6,601</td>
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<tr>
<td>Vegetable export total</td>
<td>289</td>
<td>321</td>
<td>353</td>
<td>419</td>
<td>460</td>
<td>469</td>
<td>574</td>
<td>151</td>
<td>199</td>
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<td>Of which:</td>
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<tr>
<td>Fresh vegetable (HS07)</td>
<td>124</td>
<td>144</td>
<td>147</td>
<td>159</td>
<td>191</td>
<td>174</td>
<td>181</td>
<td>251</td>
<td>140</td>
<td>202</td>
</tr>
<tr>
<td>Ratio of vegetable export (%)</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>12</td>
<td>11</td>
<td>10</td>
<td>9</td>
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<tr>
<td>Vegetable import total</td>
<td>43</td>
<td>54</td>
<td>67</td>
<td>100</td>
<td>136</td>
<td>135</td>
<td>190</td>
<td>239</td>
<td>314</td>
<td>556</td>
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<td>Of which:</td>
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<tr>
<td>Fresh vegetable (HS07)</td>
<td>28</td>
<td>34</td>
<td>42</td>
<td>71</td>
<td>94</td>
<td>92</td>
<td>132</td>
<td>170</td>
<td>329</td>
<td>607</td>
</tr>
<tr>
<td>Balance total vegetable</td>
<td>246</td>
<td>267</td>
<td>286</td>
<td>318</td>
<td>324</td>
<td>300</td>
<td>279</td>
<td>335</td>
<td>122</td>
<td>136</td>
</tr>
<tr>
<td>Balance fresh vegetable (HS07)</td>
<td>96</td>
<td>110</td>
<td>105</td>
<td>88</td>
<td>97</td>
<td>82</td>
<td>49</td>
<td>81</td>
<td>85</td>
<td>84</td>
</tr>
</tbody>
</table>

Source: KSH foreign trading database

Considering the production of sweet corn, Hungary achieved the first place on the European list during the past 20 years, however this progress is shaded by the fact that we are not able to influence significantly the European price trend. Consequently, the price fluctuation between the years is hectic, cannot be treated and followed.

Producers of Hungarian onion - that was world famous earlier – are suffered by permanent market troubles, main reason of which is lack of organization and one of common marketing appearance.

There are still great unexploited spares in water-melon, pea, green paprika and tomato but also in root vegetable. Basic condition of the spare exploiting is co-operation, unit of force, to which exact recommendations will be provided in the Vegetable Program (Fig. 1).
Table 5

Delivery of vegetable industry (1995-2014)

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</thead>
<tbody>
<tr>
<td>Harvesting area</td>
<td>thousand ha</td>
<td>119.4</td>
<td>95.6</td>
<td>104</td>
<td>85</td>
<td>91.1</td>
<td>90.5</td>
<td>85</td>
<td>90</td>
</tr>
<tr>
<td>Of which: tomato*</td>
<td>thousand ha</td>
<td>11.8</td>
<td>6</td>
<td>5.9</td>
<td>3.6</td>
<td>2.9</td>
<td>2.6</td>
<td>4</td>
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<tr>
<td>Production volume</td>
<td>thousand tons</td>
<td>1 644</td>
<td>1 540</td>
<td>2 033</td>
<td>1 547</td>
<td>1 779</td>
<td>1 760</td>
<td>2 000</td>
<td>2 200</td>
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<tr>
<td>Of which: tomato*</td>
<td>thousand t</td>
<td>231</td>
<td>203</td>
<td>269</td>
<td>188</td>
<td>205</td>
<td>228</td>
<td>200</td>
<td>230</td>
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<tr>
<td>Tomato* harvest average</td>
<td>t/ha</td>
<td>137</td>
<td>23.3</td>
<td>35.4</td>
<td>38.1</td>
<td>50.7</td>
<td>45.5</td>
<td>50</td>
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</tbody>
</table>

* Industrial and eating tomato together.
Source: KSH and AKI prognosis (2010-2014)

Delivery of the vegetable industry between 1995 and 2014 is shown in the Table 5, based on AKI prognosis.

We note that the predicted development can be meant very modest. Hungary will have to produce at least 1-1.5 million tons more till 2014.

FOILED HOUSE VEGETABLE FORCING – DEVELOPMENT PROGRAM SCENARIOS AND UNIFICATIONS OF PRODUCERS

As seen in the Fig. 2 the total forcing area has declined from 6300 ha to 5700 ha, while each factor would provide reasons that we
significantly increase the vegetable growing area.

An automated hydro-culture vegetable forcing foiled house of 10 ha, a manipulating packaging facility of 2000 m² and a cooling house of 500 m² are shown in the Fig. 3. This is a significant program element requiring investment however the measurements make it possible to apply the up-to-date technique and technology efficiently and to produce vegetable in large volume and good quality.

In the Table 6, 3 foiled house vegetable forcing development program scenarios are shown.
Table 6

<table>
<thead>
<tr>
<th>Scenario version</th>
<th>Foiled forcing facilities, temperated manipulation, packaging cooling houses</th>
<th>Green energy wood plantation</th>
<th>Harvest thousand tons</th>
<th>Product. value</th>
<th>Product. costs</th>
<th>Revenue before taxes</th>
<th>Perm. employed (persons)</th>
<th>Product. Value/employed</th>
<th>Revenue before taxes/employed</th>
</tr>
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<tbody>
<tr>
<td><strong>1</strong>. version: 1000 ha</td>
<td>161.0 bill HUF Self-contribution: 96.6 bill HUF Subsidy: 64.4 bill HUF</td>
<td>134.0 thousand ha Total: 93.8 bill HUF Self-contribution: 56.3 bill HUF Subsidy: 37.3 bill HUF</td>
<td>397</td>
<td>134.0 bill HUF</td>
<td>65.3 bill HUF</td>
<td>68.7 bill HUF</td>
<td>12.500</td>
<td>6.35 bill HUF</td>
<td>1.12 bill HUF</td>
</tr>
<tr>
<td><strong>2</strong>. version: 2000 ha</td>
<td>322.0 bill HUF Self-contribution: 193.2 bill HUF Subsidy: 128.8 bill HUF</td>
<td>268.0 thousand ha Total: 187.6 bill HUF Self-contribution: 112.6 bill HUF Subsidy: 75.0 bill HUF</td>
<td>794</td>
<td>158.6 bill HUF</td>
<td>130.6 bill HUF</td>
<td>28.0 bill HUF</td>
<td>25.000</td>
<td>6.35 bill HUF</td>
<td>1.12 bill HUF</td>
</tr>
<tr>
<td><strong>3</strong>. version: 3000 ha</td>
<td>483.0 bill HUF Self-contribution: 289.8 bill HUF Subsidy: 193.2 bill HUF</td>
<td>402 thousand ha Total: 281.4 bill HUF Self-contribution: 168.9 bill HUF Subsidy: 112.5 bill HUF</td>
<td>1.191</td>
<td>237.9 bill HUF</td>
<td>195.9 bill HUF</td>
<td>42.0 bill HUF</td>
<td>37.500</td>
<td>6.35 bill HUF</td>
<td>1.12 bill HUF</td>
</tr>
</tbody>
</table>

Source: Own calculations and Tégla, 2008

Besides the green energy wood plantation the corn straws and thermal water can be mentioned as local energy source. However, optimum combination of these ones can mainly be realised in a certain place. Opportunities of thermal water utilisation are shown in the following figure since the purpose is to get more and more energy from water by consecutive utilisation methods as geothermal energy bearing media.

For third version, one-third domestic utilisation can increase the annual volume of vegetable produced in foiled forcing facility by 79.2 billion HUF. If vegetable produced in such a manner is exported in two-third ratio then it will mean an annual export surplus of 158.7 billion HUF, which is 0.9-1 billion USD annually. It means that our average vegetable export of 2003-2005 amounting 438 million USD can be three times higher during ten years. Besides the export increase the Vegetable Program has/can have serious importance permanently in the employment, because through training of unskilled workforce about 37 500 persons can take part in a permanently profitable activity. Similar like economic purposes the solutions of social stresses are also important which can be made by the program. It can only be achieved if selecting realisation locations of Vegetable Program that one of the major aspects will be to help efficient, long-term support of rising of settlements, micro-regions suffered by permanent, high ratio unemployment. The task –also in this field –is very complex and
requires serious planning, innovative and steady realisation. Obviously, taking the relatively unskilled workforce back in the world of labour means a lot of risks. Since such activity shall be taught to them which requires careful attention higher than average. Difficulty of the task is tried to show in the Fig. 4.

The full Vegetable Program contains such modernisation opportunities, for realisation of which the responsible, long-term activity of the state, municipalities and higher education is necessary.

We have made those calculations, which represent the budget influences of the program scenarios.

Figure 4
Taking workforce back in the word of labour

- System of workforce employment
- Training and motivation program of three years
- System of intensive supervision and management
- Motivation trainings
- Methods of fluctuation reduction
- Vocational training when working
- Semi-skilled workers training
- Delivery of complete training material to partners of Vegetable Program
- Local adaptation of complete training package at partners

Source: Own edition

We think that data of the Table 7 are clear evidence that it is worth to realise a program for development of forced vegetable production.

Multiple effects exerted by the Vegetable Program on the employment are shown in the Fig. 5.
### Table 7

Economic Characteristics and Budgetary Influences for Three Foiled Vegetable Forcing Program Variations (million HUF)

<table>
<thead>
<tr>
<th>Description</th>
<th>1000 ha</th>
<th>2000 ha</th>
<th>3000 ha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Investment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foiled forcing facility and greenhouse</td>
<td>299 000</td>
<td>398 000</td>
<td>897 000</td>
</tr>
<tr>
<td>Green energy wood plantation</td>
<td>93 800</td>
<td>187 600</td>
<td>281 400</td>
</tr>
<tr>
<td><strong>Investment total</strong></td>
<td>392 800</td>
<td>785 600</td>
<td>1 178 400</td>
</tr>
<tr>
<td>Investment subsidy (70%)</td>
<td>274 960</td>
<td>549 920</td>
<td>824 880</td>
</tr>
<tr>
<td>Investment self-contribution (30%)</td>
<td>117 840</td>
<td>235 680</td>
<td>353 520</td>
</tr>
<tr>
<td><strong>Revenue</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>120 000</td>
<td>240 000</td>
<td>360 000</td>
</tr>
<tr>
<td><strong>Expenditure and amortisation</strong></td>
<td>116 400</td>
<td>232 800</td>
<td>349 200</td>
</tr>
<tr>
<td>Profit before taxes</td>
<td>3 600</td>
<td>7 200</td>
<td>10 800</td>
</tr>
<tr>
<td>Tax paying responsibilities</td>
<td>600</td>
<td>1 200</td>
<td>1 800</td>
</tr>
<tr>
<td><strong>Profit after taxes</strong></td>
<td>3 000</td>
<td>6 000</td>
<td>9 000</td>
</tr>
<tr>
<td><strong>Permanent employed people</strong></td>
<td>22 400</td>
<td>44 800</td>
<td>67 200</td>
</tr>
<tr>
<td>Investment/employed people</td>
<td>60</td>
<td>120</td>
<td>180</td>
</tr>
<tr>
<td>Social expenditure savings (10 years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- employment of 70% unemployed people 0.6 mHUF/person/year</td>
<td>94 080</td>
<td>188 160</td>
<td>282 240</td>
</tr>
<tr>
<td>- employment of 100% unemployed people 0.6 mHUF/person/year</td>
<td>134 400</td>
<td>268 800</td>
<td>403 200</td>
</tr>
<tr>
<td>Corporate tax surplus (10 years)</td>
<td>6 000</td>
<td>12 000</td>
<td>18 000</td>
</tr>
<tr>
<td>HIPA surplus (1%) 10 years</td>
<td>6 667</td>
<td>13 334</td>
<td>20 001</td>
</tr>
<tr>
<td>Rates and taxes for person related expenditures (10 years) 289mHUF/year/ labour costs</td>
<td>124 270</td>
<td>248 540</td>
<td>372 810</td>
</tr>
<tr>
<td><strong>Budgetary balance total (10 years)</strong></td>
<td>+ 365 417</td>
<td>+730 834</td>
<td>1 096 251</td>
</tr>
<tr>
<td>Subsidy total (10 years)</td>
<td>- 275 000</td>
<td>-550 000</td>
<td>-825 000</td>
</tr>
<tr>
<td>Final budgetary balance (10 years)</td>
<td>+ 90 330</td>
<td>+180 330</td>
<td>+270 990</td>
</tr>
</tbody>
</table>

Source: Own calculations
Employment improving effect of Hungarian forced Vegetable Program

Forced vegetable production
- Establishment of vegetable forcing foil-covered houses
- Professional management
- Heat supply
- Vegetable production

Manipulating, packaging and cooling facilities
- Establishment of manipulating, packaging and cooling facilities
- Running of cooling house
- Vegetable cooling, sorting
- Vegetable sorting
- Material handling
- Packaging
- Delivery to customers

TESZ-management
- Value-chain system, presentation of interests community
- Mega Vegetable TESZ organizing
- TESZ operation management

Research & Development
- Vegetable production
- Growing, improvement of energetic plant
- Growing technology
- Harvesting technology
- Processing technology
- Utilization technology
- Logistics
- Organizing

Knowledge delivery
- Vegetable production
- Vegetable sorting, sorting, packaging
- Plantation planning
- Advisory
- Training
- Extension training
- Setting and handling of information database

Great energy wood production
- Plantation establishment
- Plantation tendering
- Harvesting
- Bee-keeping
- Small game-keeping

Legends:
- Spiritual processes
- Material processes

Activity of service providers
- Production of propagation material/wood
- Planting, tendering, harvesting of green energy wood/plant delivery, loading

Marketing
- Market research
- Brand creation
- Public Relation (PR)
- Marketing-communication

Logistics
- Output
- Input
- Handling
- Sorting
- Storage
- Feeding
- Packaging
delivery

Local production, maintenance and repair of green energy forced vegetable growing technique

Forced vegetable production
- Establishment of vegetable forcing foil-covered houses
- Professional management
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Local production, maintenance and repair of green energy forced vegetable growing technique

Employment improving effect of Hungarian forced Vegetable Program

Figure 5

Source: Own edition
We mean it particularly important that integrative unit of power be created with such extent, which will be able—through its real market weight—to reach long-term attractive conditions on behalf of domestic vegetable producers at the giant store chains having superior force today, —using and often abusing it (Fig. 6).

REFERENCES


ADDRESS:

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