

## AGRARIAN POTENTIALS IN THE REINDUSTRIALIZATION OF SERBIA - import of inputs and the opportunity costs of development -<sup>1</sup>

*Milan R. Milanović<sup>2</sup>, Simo Stevanović<sup>3</sup>, Bojan Dimitrijević<sup>4</sup>*

### Abstract

*After transitional debacles and failures, structural degradation and recession, reindustrialization is imposed as a crucial stage in the economic development of Serbia. The production-market potentials of the agro-complex (as a complex economic subsystem of pre-farm, farm and post-farm activities) and its place in the national economy open the significant possibilities of the revitalization of the industries of agrarian inputs (agricultural machines and equipment, mineral fertilizers and pesticides). Considering the structural significance of the pre-farm agrarian sector in the Serbian economy, this paper analyzes the fundamental features of production and the foreign-trade exchange, especially the dynamics and changes in the volume and structure of production and the import of agrarian inputs.*

*On that basis, through a target comparative analysis of multi-year data series (1986-2011), the paper explores the trends of production and employment, identifies transitional distortions and the growing import dependence of the Serbian economy and the agro-complex in particular; considers the agrarian potentials in a possible reindustrialization primarily via the revitalization of the industry of agrarian inputs, and highlights a special phenomenon of the opportunity costs of the Serbian agrarian development.*

- 
- 1 This paper is a part of research activities on the following projects: Project 46006, titled: Sustainable agriculture and rural development in terms of realization of strategic goals of the Republic of Serbia within the Danube region, and Project No. 179028, titled: Rural Labor Market and Rural Economy of Serbia - Income Diversification as a Tool to Overcome Rural Poverty, financed by the Ministry of Science and Technological Development of the Republic of Serbia.
  - 2 Milan R. Milanović, Ph.D., Full Professor, Megatrend University, Faculty of State Management, Goce Delčeva Street no. 8, 11070 Belgrade, Republic of Serbia, Phone: +381 11 22 03 029, E-mail: [mmilanovic@megatrend.edu.rs](mailto:mmilanovic@megatrend.edu.rs).
  - 3 Simo Stevanović, Ph.D., Full Professor, University of Belgrade, Faculty of Agriculture, Nemanjina Street no. 7, 11080 Belgrade, Republic of Serbia, Phone: +381 11 44 13 418, E-mail: [simo.stevanovic@agrif.bg.ac.rs](mailto:simo.stevanovic@agrif.bg.ac.rs).
  - 4 Bojan Dimitrijević, Ph.D., Assistant Professor, University of Belgrade, Faculty of Agriculture, Nemanjina 6, 11080, Republic of Serbia, Belgrade, Phone: +381 11 44 13 336, E-mail: [bojandi@agrif.bg.ac.rs](mailto:bojandi@agrif.bg.ac.rs).

**Key words:** *agriculture, agrarian inputs, import dependence, reindustrialization, opportunity costs.*

**JEL:** *O12, L16, Q55*

## Introduction

Agri-food sector (agro-complex) gives key structural features to the economic and industrial reality of Serbia (especially after the unsuccessful privatization, transitional recession and deindustrialization<sup>5</sup>).

The agro-complex itself can be defined as a major subsystem of the overall economy and it consists of three main segments: 1) pre-farm activities (industry of production means, i.e. production of industrial inputs for agriculture); 2) primary agriculture (production of agrarian raw material for food processing and production); 3) post-farm activities (processing, turnover and consumption of final food products).

Structural positioning of agro-complex as an economic subsystem, its place and role in the national economy development can be established and estimated in numerous ways.

Author emphasizes that the significance of agro-complex can be globally estimated by four reliable indicative parameters: 1) the share of the complex in GDP, 2) contribution to the employment, 3) participation in foreign trade balance and 4) participation in the structure of personal consumption, that is, the share of food expenses in households' budgets (Milanović, 2002).

In that context, we will here deal with trends in the basic agrarian inputs production, some questions concerning import dependence of agriculture, potential role of agro-complex in revitalization of certain industrial branches as well as needs and possibilities of reindustrialization of Serbian economy, on the basis of the increase in domestic production of agrarian inputs as industrial products with agriculture as an exclusive market.

In the postwar period, rapid development of the industry enabled an enormous transfer of labour from agriculture to industry and from rural to urban areas. Industrialization changed substantially the economic structure, prompted the division of labour,

---

5 The term *deindustrialisation* is used to describe reduction of the shares of industry in creating gross-domestic products, new values and employment participation of a country. In the case of contemporary market economy, deindustrialisation is the legal trend of development, which should be led toward the so-called postindustrial society, as (currently) the highest phase of (industrial) development of humanity. In this phase, creating of gross-domestic product, new values, and creating employment, the service sector dominates, whereby the importance of industry in overall development is not reduced. This phenomenon is, above all, the consequence of strong scientific-technical progress in the area of industry and new ways of organizing of industrial companies (concentrating on basic business activities and leaving secondary and tertiary business activities to the service industry, the so-called thinning of companies). Unfortunately, the deindustrialisation of Serbia has no contact points with this model (Adžić, 2011).

specialisation and diversification, provided a very high pace of job growth, created the conditions for the dynamic development of scientific and technological progress, improved structure and increased the volume of foreign trade, created conditions for the development of other economic sectors (primarily agriculture) and radically improved the overall standard of living (Savić, 2009).

The efficiency of industrial development was very low, and the formed industrial structure was conservative, i.e. quite unsuitable as a basis for the future development of the industry. In the last decade of the twentieth century, there was a definite fall of the industrialization model applied in Serbia. The generally accepted view is that the collapse of Serbian industry occurred as a result of the plight in which Serbia was in the last decade of the twentieth century. In recognition of these circumstances, we believe that Serbian industry would have been in crisis even if the international sanctions had not been imposed and even without the relentless destruction of its capacity in 1999, only the crisis would not be so deep (Savić, 2009).

A similar view is shared by other authors. The seventies and eighties of the twentieth century can be defined as a period of illusory growth, in which the conservative and inadequate economic and especially industrial structures were formed (high share of traditional, labour-intensive, resource and energy sectors, low levels of processing). Economic growth was not self-affirmed in the market and it certainly was not in disagreement with the foreign competition (Gligorijević, Bošković, 2007).

According to Šoškić, 'the development model' was dominantly reduced in Serbia to the opening of banks, shopping malls, betting houses and construction of luxury residential and commercial buildings. The structure of added value for nearly 60% comes from services, while only 29% comes from industry and construction. Compared to the EU countries, which are by the level of GDP per capita closer to Serbia, it can be seen that they have a much higher percentage of industry and construction (30-38%) than in Serbia (Šoškić, 2009).

Research shows that privatised industrial enterprises did not improve the effectiveness of operations (as a logical consequence of the change of ownership structure), inter alia, because the new owners were not interested in intensifying the existing production. Capital turnover is slower in the industry, and requires much more knowledge and management skills, which local or private individuals neither possess, nor can acquire in the short term. Only a small number of privatised enterprises made significantly better results than prior to the privatisation, which they owe to their entry to the foreign capital property (e.g. Slovenian and Croatian), because these companies generally do not have problems of bad privatisations (drop in production, plant shutdown, layoffs, etc.) (Bošković, 2011).

Employment in the industry was reduced by half during the 2000s. The share of industrial production in the creation of gross domestic product amounted to (only) 13% and was the lowest in the region, structural changes were modest and slow, the losses piled up (Vučković, 2010).

The food industry can become a significant exporter of healthy (organic) food with a distinctive national origin. The export of these products, especially to the EU market, requires adaptation of local regulations in food production to the demands of this market. The food industry determines not only the export but also the food security of the country, and it provides the production of raw materials for other industries and has a manifold influence and importance for complementary agricultural development and intensification of production in it (Mičić, Zeremski, 2011).

Agriculture and agro-industry have been considered as significant prospects of Serbian economy for years. In the period of major energy crisis in the world in the '70s ('oil shock') the phrase 'food is our oil' got assimilated'.

The development of agriculture and of the whole agro-food complex in that period was largely based on the development of agrarian inputs industry and (even) subsidization of their consumption.

However, two opposite trends have been noticed in the last years - rapid decrease in domestic production and consequently in the number of industrial workers in inputs production on one hand, and on the other, rapid increase in the import of tractors, machines and equipment for agriculture, mineral fertilizers, pesticides and other substances and means for animal and plant feeding and protection.

### **Materials and Methods**

Therefore, we are trying to quantify the most important macro-economic consequences of the two trends indicated.

Those consequences are numerous and can be expressed through the deindustrialization of economy, decrease in the number of industrial workplaces, import increase and negative foreign trade balance, increase in inputs' prices and decrease in their consumption by capacity unit, stagnation and extension of the whole agriculture, instability of agrarian market and rapid social stratification.

In order to have a more thorough insight into the complexity and structural position of a specific part of agro-industrial complex in Serbian economy, the analysis involves the so-called pre-farm industrial activities of agro-complex connected to production and to foreign trade balance.

The inputs production, in the sense of classification of the activities (which distinguishes six levels of aggregation: sector, subsector, field, branch, group and subgroup) has been observed on the level of subgroups, as the lowest level of aggregation.

The analysis includes production of the chemicals and machines for agriculture (fertilizers and pesticides) and food production.

Therefore, only the following subgroups have been included: 24,150 Production of fertilizers and nitrogen compounds; 24,200 Production of pesticides and other chemicals for agriculture; 29,310 Production of tractors for agriculture; 29,320 Production of other machines for agriculture; 29,530 Production of machines for food and drinks industry.

According to the foreign trade statistics i.e. international trade classification (sectors, departments, groups, subgroups, positions), the analysis includes specific industrial products with agriculture as an exclusive market, hence, all major agrarian inputs, primarily equipment, pesticides and fertilizers (which can be identified by two, three or four units in the Standard International Trade Classification as departments, groups or subgroups of industrial products whose consumption is intended for agriculture).

From sector 7-machines, means of transport, only the following have been included: 721 machines for agriculture, 722 tractors, 727 machines for food production.

From sector 5-chemical products, only pesticides for agriculture, namely subgroups: 5,911 insecticides, 5,912 fungicides and 5913 herbicides have been included.

Fertilizers have been classified into two sectors. That way, from sector 2-raw materials, department 27-raw fertilizers have been included (except from sector 56) and from sector 5-chemical products, department 56-fertilizers have been included (except the raw ones).

Thus, on the basis of official statistical data (Bureau of Statistics data base), the analysis of reindustrialized potential of agro-complex and its place in economic structure includes all most important segments of industrial branches whose production is exclusively intended for agriculture and food production, with a significant influence on processing, trade and consumption of final food products.

### **Transitional distortions in agrarian inputs production**

We start observing reindustrialized potential of agro-complex and its place in economic structure by the overview of the trends of production and employment in industrial branches with the production intended for agriculture. As mentioned above, five subgroups of activities have been included, within a relatively long period of 2- 2.5 decades (*Table 1*).

The trends in production and employment were monitored during a relatively long period (1986-2010), which includes the time before sanctions, the former state separation as well as the time of so-called transition, liberalization and economic privatization.

It can be seen (*Table 1*) that in all 5 analyzed subgroups of activities, a rapid decrease took place and furthermore there was the termination of production of the most important agrarian inputs:

- production of machines for food industry almost totally stopped (!),
- production of tractors reduced 20 times by the end of the last decade of 20<sup>th</sup> century, from 100,000 tons, in mid ‘80s,
- production of other machines for agriculture also reduced more than 20 times in the period taken,
- production of pesticides reduced to 1/10 of the former volume,
- production of fertilizers reduced by 2/3 compared to the volume in mid ‘80s.

**Table 1.** Dynamics of reduction in agrarian inputs production in Serbia (1986-2010)

Year	Fertilizers (t)	Pesticides for agriculture (t)	Tractors for agriculture* (t, piece)	Other machines for agriculture (t)	Machines for food industry (t)
1986	2,505,639	36,148	98,045 t	85,014	8,235
1987	1,449,134	32,657	91,418 t	86,064	8,837
1988	2,407,934	34,683	92,604 t	78,741	10,047
1989	1,905,469	27,911	94,074 t	73,955	9,071
1990	1,525,739	23,231	62,736 t	60,939	7,545
Ø1986-1990	1,958,783	30,926	87,775 t	76,942	8,747
1996	869,665	12,436	3,479 t	6,405	354
1997	917,691	12,517	8,835 t	11,606	198
1998	686,673	16,313	6,768 t	11,300	169
1999	318,093	12,710	3,657 t	6,274	107
2000	410,522	12,182	4,527 t	7,375	200
Ø1996-2000	640,529	13,231	5,453 t	8,592	205
2006	679,579	6,157	2,387	4,967	387
2007	947,371	7,418	1,949	5,195	291
2008	605,206	6,418	1,826	5,697	55
2009	579,078	5,229	3,625	3,160	42
2010	905,842	4,040	2,153	3,386	53
Ø2006-2010	743,415	5,852	2,388	4,481	165

\* By 2000, in tons, since 2006, number of pieces

Source: Statistical Office of the Republic of Serbia, Belgrade, *Bulletin Industry*; data bases: [www.statserb.gov.rs](http://www.statserb.gov.rs)

One of the most eminent domestic producers of tractors (IMT, New Belgrade, now in restructuring), whose production was in the beginning developed under license MASSEY FERGUSON, afterwards based on its own technical documentation, later even in cooperation with PERKINS, in 1988 reached record in production: 42,000 tractors and 35,000 machine with the value that was more than 600 million German Marks at that time (<http://www.imt.co.rs/Istorija.php>).

Knowing that in 1949, in IMR, the first Yugoslav tractor was manufactured (IMR Zadrugar T-08, petrol), the fact that the whole production of tractors in Serbia (2011) fell to less than 2,000 pieces a year, is really deplorable.

The firms from the analyzed subgroups of activities, like any other firms as economic entities 'sui generis', were established by the engagement of available economic factors in order to make a profit and achieve the ultimate goal - new engagement of those 'foundation' factors, primarily employment, as a factor of production.

Nevertheless, what happened to the employees in agrarian inputs industry in that completely wrong, socially unjust, discriminatory, immoral concept of the privatization of Serbian economy is shown in the Table 3.

Although the figures in the table above clearly show the rapid absolute decrease in the number of employees in agrarian inputs production, it is even more evident by the relative values in Table 4.

**Table 2.** Dynamic of reduction in agrarian inputs production (1986-2010)  
(base indexes: 1986=100)

Year	Fertilizers	Pesticides for agriculture	Tractors for agriculture	Other machines for agriculture	Machines for food industry
1986	100	100	100	100	100
1987	58	90	93	101	107
1988	96	96	94	93	122
1989	76	77	96	87	110
1990	61	64	64	72	92
Ø1986-1990	78	86	90	91	106
1996	35	34	4	8	4
1997	37	35	9	14	2
1998	27	45	7	13	2
1999	13	35	4	7	1
2000	16	34	5	9	2
Ø1996-2000	26	37	6	10	2
2006	27	17	-	6	5
2007	38	21	-	6	4
2008	24	18	-	7	1
2009	23	14	-	4	1
2010	36	11	-	4	1
Ø2006-2010	30	16	-	5	2

Source: Author’s calculation based on data from Table 1.

In the mid ‘80s, there were about 30,000 employees in agrarian inputs industry (reliable statistical data about the employment in pesticides production lack, though it is known that in a few leading producers such as Župa-Kruševac, Zorka-Šabac, Zorka-Subotica, Galenika Fitofarmacija - Zemun, there were about 1,500 employees). During the period taken, in this, highly propulsive branch, several new small private firms were founded, mostly as agents and distributors of world famous producers.

The number of employees in all five subgroups of activities in this industry reduced to 2,600 in 2010. Consequently, only in agrarian inputs industry 27,500 workplaces were abolished during the transition (that is about 10 times more than it is promised by the state project FIAT or several biggest so-called direct foreign investments in Serbia).

It is obvious that market was not a limiting factor (as it was often emphasized as the reason for privatization and closing down of the firms in transition), as the domestic agriculture remained a safe big buyer, which is clearly shown by the data about agrarian inputs import.



Our opinion about the wrong, socially unjust, discriminatory, immoral concept of Serbian economy privatization, which, besides numerous negative consequences, also caused the process of deindustrialization, is based on two premises, the theoretical and the practical one.

**Table 3.** The number of employees in agrarian inputs production, 1986-2010

Year	Fertilizers	Pesticides for agriculture*	Tractors for agriculture	Other machines for agriculture	Machines for food industry
1986	<b>6,197</b>	-	<b>9,630</b>	<b>11,700</b>	<b>1,414</b>
1987	5,763	-	8,790	11,935	1,673
1988	5,082	-	8,380	11,660	2,013
1989	4,771	-	8,386	12,680	1,765
1990	3,776	-	6,540	12,473	1,819
Ø1986-1990	<b>5,117</b>	-	<b>8,345</b>	<b>12,089</b>	<b>1,736</b>
1996	5,131	-	4,467	9,267	582
1997	5,310	-	8,037	8,825	255
1998	5,084	-	5,934	8,521	195
1999	4,324	-	5,002	8,569	170
2000	4,372	-	4,078	7,710	241
Ø1996-2000	<b>4,844</b>	-	<b>5,503</b>	<b>8,578</b>	<b>288</b>
2006	2,477	-	1,694	3,397	589
2007	2,198	-	1,409	2,190	647
2008	2,043	-	1,214	1,817	606
2009	1,710	-	1,222	1,118	571
2010	1,350	-	958	959	565
Ø2006-2010	<b>1,955</b>	-	<b>1,299</b>	<b>1,896</b>	<b>595</b>

\* Documentation of the Department for statistics of employment and wages (2006-2010), Bureau of statistics, Unreliable data for the subgroup Production of pesticides.

Source: Statistical Office of the Republic of Serbia, Belgrade, *Bulletin Industry*; data bases: [www.statserb.gov.rs](http://www.statserb.gov.rs)

The practical premise refers to the fact that the platform for the privatization was an eclectic mixture of positivist and normative economies. The positivist economy – the estimation is that the existent economic system is inefficient and unsustainable (which proved wrong because a lot of not privatized firms survived while most of the privatized ones closed down, except for the ones which already operated successfully as public. Moreover, even after 20 years, economic activity in that ‘new and more efficient system did not reach its pre-transitional level). The normative economy - the statement that privatization is a necessary condition for ‘what should be’, that is, maximum benefit for each individual, common interest and/or economy of welfare. However, in the privatization process (which became a mere goal not a means), new owners did not purchase firms (as economic entities ‘sui generis’) but their property (real estate and reserves) and made most employees redundant. The state not only approved of such behavior of the new owners but also provided the redundant workers with premature pensions, gratuities and social programmes (thus rapidly increasing budget deficit and public debt).



Thus there is the premise about the failure of privatization concept which includes the dimension of righteousness and ethics.

The issue is brought up - which government (or political authority) can, establishing its macroeconomic aims of social and economic development, determine and change the destiny of any individual, by selling, in its own name and for its own account, in essence the ‘non-state’ (social, labor) property, doing this by privatizing their firms, abolishing their workplaces with the explanation that all the acts are of common interest and for the economic welfare in the future. The fundamental principle of the economy of welfare is toppled here, no matter whether it is accepted 1) that welfare of a society is determined solely by its members (fundamental ethical postulate of individualism) or 2) that society will benefit if any member does good without worsening the status of anyone else (Pareto principle) (Lovre, Zekić, 2011).

**Table 4.** Dynamic of reduction of the number of employees in agrarian inputs production (base indexes 1986=100)

Year	Fertilizers	Pesticides for agriculture*	Tractors for agriculture	Other machines for agriculture	Machines for food industry
1986	100	-	100	100	100
1987	93	-	91	102	118
1988	82	-	87	100	142
1989	77	-	87	108	125
1990	61	-	68	107	129
Ø1986-1990	83	-	87	103	123
1996	83	-	46	79	41
1997	86	-	83	75	18
1998	82	-	62	73	14
1999	70	-	52	73	12
2000	71	-	42	66	17
Ø1996-2000	78	-	57	73	20
2006	40	-	18	29	42
2007	35	-	15	19	46
2008	33	-	13	16	43
2009	28	-	13	10	40
2010	22	-	10	8	40
Ø2006-2010	32	-	13	16	42

Source: Author’s calculation based on data from Table 3.

Therefore, in the process of privatization, social position and status of the vast majority of workers not only worsened but became endangered to the lowest existential level.

On the other hand, the minority benefited. Consequently, domestic production reduced, import dependence increased, GDP structure imperiled. That is why the policy of privatization proved to be a wrong, socially unjust and immoral concept. (Stevanović et al., 2011)

### Import dependence in foreign trade of agrarian inputs

The volume, structure and conditions of foreign trade of agro-food products change significantly in time and space. In so called pre-transitional period, the unstable primary agricultural production, radical changes in domestic market, prohibitions and exterior foreign trade limits, forced adaptation of the inner economic system with the character of arbitration and foreign trade restrictions, were not the elements of favorable but of undoubtedly, immensely unfavorable development climate. Under such circumstances, agro-industrial export could have had more serious and more stable results.

Agriculture and its market in Serbia, in the first decade of 21<sup>st</sup> century are characterized by stagnation, declining trends, non-stability and regional differences in production volume and structure. Such trends, regarding the period taken and general conditions of privatization, liberalization and deregulation, can be called transitional distortion of agriculture and its market. (Milanović, Đorović, 2011)

During the transition, Serbia experienced complete deindustrialization, by which the level of industrial development has been reduced to 30-60% of the level of the 1980s. The 1999 NATO bombing of military and, to a significant extent, industrial capacities was an introduction into the headlong fall of the industry at the beginning of 21<sup>st</sup> century, when its share was reduced from 20.2% in 2002 to merely 15.9% in 2009. (Stevanović et al., 2013)

**Table 5.** The importance of agrarian inputs for Serbian foreign trade balance 2005-2011  
(mill. US \$)

		2005	2006	2007	2008	2009	2010	2011
1.	Food products export	927	1,275	1,696	1,974	1,957	2,255	2,722
2.	Agrarian inputs export	58	48	72	134	70	91	134
3.	Agrarian export-total (1+2)	985	1,324	1,768	2,108	2,027	2,346	2,858
4.	Inputs share in agrarian export (2:3)	5.9	3.6	4.1	6.4	3.4	3.9	4.7
5.	Food products import	825	960	876	1,169	1,047	1,084	1,461
6.	Agrarian inputs import	317	377	394	585	388	302	540
7.	Agrarian import-total (5+6)	1,142	1,337	1,270	1,754	1,435	1,386	2,001
8.	Inputs share in agrarian import (6:7)	27.7	28.2	31.0	33.5	27.0	21.8	27.0
9.	Inputs balance (2- 6)	-259	-329	-322	-544	-318	-211	-406
10.	Serbian export - total	4,482	6,428	8,825	10,974	8,344	9,795	11,777
11.	Serbian import - total	10,461	13,172	19,164	24,331	16,056	16,735	20,139
12.	Share of agrarian in total export (%)	22.0	20.6	20.0	19.2	24.3	23.9	24.3
13.	Export coverage of import (%)	42.8	48.8	46.0	45.1	52.0	58.5	58.5
14.	Export coverage of agrarian import (%)	86.2	99.0	139.2	120.2	141.3	169.3	142.8
15.	Export coverage of inputs import (%)	18.3	12.7	18.2	22.9	18.8	30.1	24.8

16.	Inputs share in total export (%)	3.0	2.9	2.0	2.4	2.4	1.8	2.7
-----	----------------------------------	-----	-----	-----	-----	-----	-----	-----

Source: Statistical Office of the Republic of Serbia, Belgrade, *Bulletin Industry*; data bases: [www.statserb.gov.rs](http://www.statserb.gov.rs)

The long-term dynamics of total agricultural production in Serbia, in the last twenty years or more, shows cyclic instability, stagnation or a very slow increase, with significant differences between crop production (slight increase) and livestock farming (continuous decrease). (Milanović, 2011)

That inevitably strikes the foreign trade in agro-food sector, which generally has the tendency of extending. Contrary to the expectations and proclamations, constant increase in the share of the primary in comparison with the products of high finalization is noticed.

Food products (in sectors 0-Food and livestock, 1-Drinks and tobacco, chosen products from sector 2-Raw materials, 4-Animal and vegetable oils and fats) and of agricultural inputs (defined in the Introduction), significantly influenced the total foreign trade, at the end of the last decade. Unfortunately, disparity featured it for many years. That negative balance reached \$13.3 billion (2008), before the so-called world economic crisis.

**Table 6** Agrarian inputs import, 2005-2011(\$ million)

Group	Name	2005	2006	2007	2008	2009	2010	2011
721	Machines for agriculture	53	62	56	75	41	38	73
722	Tractors	25	36	22	27	10	11	74
727	Machines for food production	30	33	30	49	23	15	28
<b>I</b>	<b>Equipment-total</b>	108	131	108	151	74	64	175
5911	Insecticides	10	10	7	12	9	10	15
5912	Fungicides	13	15	10	13	10	11	21
5913	Herbicides	34	35	22	45	34	24	40
<b>II</b>	<b>Pesticides - total</b>	57	60	39	70	53	45	76
27	Raw fertilizers	52	55	47	54	43	46	69
56	Fertilizers	100	131	199	310	219	147	220
<b>III</b>	<b>Fertilizers - total</b>	152	186	247	364	262	192	289
	<b>INPUTS - TOTAL</b>	317	377	394	585	388	302	540

Source: Author's calculation based on data from the Statistical Office of the Republic of Serbia.

The seriousness of the problems in foreign trade and Serbian economy can be illustrated with the fact that the total foreign trade balance surpasses many times the total agrarian export (\$2.1 billion), a development prospect of export economy.

Agrarian export was steadily increasing in the last seven years, reaching (so far) the record of \$2.8 billion (2011), which makes a quarter of the total Serbian export. However, the inclusion of agrarian inputs trade - equipment, pesticides, fertilizers (total annual import is over half a billion dollars) in the agrarian foreign trade balance,

significantly changes the idealistic prospect offered merely on the basis of export.

If the agrarian export is determined by aggregation of the exports of agricultural and food products and of agrarian inputs (as previously described), the value of inputs export (about \$50-130 mill. a year) is marginal (3-6%). However, if agrarian import is analyzed in a similar way, the picture is completely different: the share of total inputs import reaches about 1/3 of the value of agrarian import.

A more detailed insight into the values of inputs import is given in Table 6. The annual value varies a lot, from \$300 million to \$580 million. The least value is of pesticides (up to \$75 mill.), then machines import (between \$70 mill. and \$175 mill.) while the largest outflow was on imports of fertilizers (over \$360 mill. a year).

Economic importance of agrarian inputs import, besides absolute values, can be observed more thoroughly in the context of sector structure of the total agrarian import (Table 7) and export as well.

**Table 7** Inputs share in the agrarian import structure, 2005-2011 (%)

Sector	Name/group of products	2005	2006	2007	2008	2009	2010	2011
0	Food and animals	54.3	50.7	53.1	50.9	54.0	57.9	54.1
1	Drinks and tobacco	10.6	12.5	7.4	6.4	8.4	8.7	10.2
2	Raw materials (only 21, 22 and 29)	4.2	4.4	5.0	5.5	6.5	8.0	5.5
3	Vegetable and animal oils and fats	1.7	2.9	2.3	2.8	3.2	2.9	2.3
I	Agricultural and food products-total (0+1+2+3)	70.8	70.5	67.8	65.5	72.1	77.5	72.0
<b>II/1</b>	<b>Equipment for agriculture</b>	<b>10.0</b>	<b>10.3</b>	<b>8.9</b>	<b>8.9</b>	<b>5.3</b>	<b>4.8</b>	<b>9.1</b>
721	Machines for agriculture	4.9	4.8	4.6	4.4	3.0	2.8	3.8
722	Tractors	2.3	2.8	1.8	1.6	0.7	0.8	3.8
727	Machines for food production	2.8	2.6	2.5	2.9	1.7	1.1	1.5
<b>II/2</b>	<b>Pesticides</b>	<b>5.2</b>	<b>4.7</b>	<b>3.2</b>	<b>4.1</b>	<b>3.8</b>	<b>3.4</b>	<b>3.9</b>
5911	Insecticides	1.0	0.8	0.6	0.7	0.6	0.8	0.8
5912	Fungicides	1.2	1.2	0.8	0.8	0.7	0.9	1.1
5913	Herbicides	3.1	2.8	1.8	2.7	2.4	1.8	2.1
<b>II/3</b>	<b>Fertilizers</b>	<b>14.0</b>	<b>14.5</b>	<b>20.1</b>	<b>21.4</b>	<b>18.8</b>	<b>14.4</b>	<b>15.0</b>
27	Raw fertilizers	4.8	4.3	3.8	3.2	3.1	3.5	3.6
56	Fertilizers (except for the raw ones)	9.2	10.2	16.3	18.3	15.7	10.9	11.4
<b>II</b>	<b>Inputs - total</b>	<b>29.2</b>	<b>29.5</b>	<b>32.2</b>	<b>34.5</b>	<b>27.9</b>	<b>22.5</b>	<b>28.0</b>
<b>III</b>	<b>Agrarian - total (I + II)</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

*Source:* Author's calculation based on data from the Statistical Office of the Republic of Serbia. In every open economy, there is intro-industrial foreign trade where sector 0-Food and livestock (with over 50%) is, naturally, dominant.

The shares of other products are between 22% and 35% of agrarian import, pesticides about 5%, equipment about 10% and most of all, fertilizers 15 – 20 percentage points. Therefore, the agrarian inputs import surpasses the import in the sectors Drinks and tobacco, raw materials, Animal and vegetable oils and fats.

The importance of agrarian inputs import can also be observed in the relation between agricultural and food products export (without agrarian inputs export) and agrarian inputs import. Another dimension of the importance of imports of agricultural inputs can be viewed via the unit load of exports, i.e. the ratio of the value of exports of agricultural and food products (excluding exports of agricultural inputs) and the value of imports of agricultural inputs. In the last seven years (2005-2011), the average annual value of agricultural and food products export was about \$1,830 million and of agrarian inputs about \$415 million. This means that on each agricultural export value unit, 0.23 units of agrarian inputs was imported. Moreover, the value of fuel for machines was not taken into account.

All the facts mentioned above open questions about comparative advantages of export (Pelević, 2004) and affect the common opinion about the superiority of Serbian agrarian export.

### **Conclusions**

The analysis of reindustrialization potential of agro-complex includes all important segments of industrial activities whose products as inputs, are intended exclusively for agriculture and food production. On one hand it also includes the trends in production and employment, and on the other hand, the trends in volume and structure of agrarian inputs import.

In all of the five analyzed subgroups of activities, a rapid decline, even termination of the production of most important agrarian inputs took place in some cases. The production of machines for food industry is almost terminated; the production of tractors and other machines for agriculture is reduced by 20 times; pesticides production fell to 1/10 and fertilizers production to 1/3 of the former volume.

In the mid '80s, there were about 30,000 employees in agrarian inputs industry and in 2010 there were about 2,600. Therefore, only in the agrarian inputs industry 27,500 workplaces were abolished during the 'transition'.

Agrarian export was increasing continuously in the last seven years, reaching the record of \$2.8 billion (2011), which makes ¼ of total Serbian export.

The involvement of agrarian inputs trade (with the total annual import of over half a billion dollars) significantly changes foreign trade balance: the share of total inputs import reaches 1/3 of agrarian import value. On each unit of export value, 0.23 unit of agrarian inputs (machines, pesticides, fertilizers) were imported. Another dimension of the importance of imports of inputs can be seen from a unit load of exports: each unit value of export of agricultural products, on average, 0.23 unit values of basic

agricultural inputs (machinery, pesticides, fertilizers) were imported. Thus, every euro of export needed around  $\frac{1}{4}$  Euro of inputs import (the value of the fuel for the machines for agriculture was not taken into account).

The structure of agrarian foreign trade is getting worse: the share of raw materials and primary, unprocessed products in the export is increasing, along with the import of final products which could be made from domestic exported raw materials; domestic production is declining and agrarian inputs import is increasing.

From macroeconomic point of view, all that raises a question of opportunity costs of Serbian agrarian export.

The leading position of grains in the export tells a lot about comparative advantages and at the same time implies negative aspects of production factors usage (land, labour, capital): the lowest added value is obtained per surface unit; the products that engage little labour force (few domestic workplaces) but a lot of capital in machines and other inputs (from import) are exported. This also engages loans (from foreign banks).

Contrary to the theory of comparative advantages, the abundant factors (land and labour force) are not used enough but the factors in minimum (capital) instead. This means that, contrary to the theory of comparative advantage, factors which are in abundance (land and labor) are underused and the use of factors in a minimum (capital) is enforced.

Reindustrialization potential of agro-complex was analyzed through quantification of two connected negative economic flows: 1) as lost domestic production of agrarian inputs and lost workplaces in certain industry branches and 2) as the decline of foreign trade and considerable foreign exchange spending on agrarian inputs import (a consequence mainly of domestic production termination).

It is assumed that these flows could be directed towards reindustrialization of Serbian economy. They could be regarded as opportunity costs of Serbian agrarian economy because they cease natural and other comparative advantages of Serbian agriculture to a great extent.

Agriculture-industry reproductive input-output relations, through such negative flows, prove that domestic agriculture is indirectly in the function of development and employment not in domestic but in foreign industry instead.

That is certainly a problem not only of agrarian policy and the strategy of agrarian development but of conception and strategy of development on the whole, in post-transitional period.

## References

1. Adžić, S. (2011): *Povratak industrije u Srbiju - između želja, mogućnosti i iluzija*, Ekonomija, Vol. 18, No. 2, Zagreb, pp. 403-466.
2. Bošković, G. (2011): *Nužnost izvozno orijentisane strategije reindustrijalizacije Srbije*, Ekonomske teme, Vol. 49, No. 2, Niš, pp. 235-249.

3. Gligorijević, Ž., Bošković, G. (2007): *Mehanizam unapređenja konkurentnosti industrije*, Ekonomski fakultet Niš, Niš.
4. Lovre, K., Zekić, S. (2011): *Economic analysis of agrarian reforms*, Faculty of Economics, Subotica.
5. Milanović, M. (2002a): *Food industry in Federal Republic of Yugoslavia – development-production-consumption-quality-export, 1980-2000, (Monograph)*, Institute of Agricultural Economics (IEP) and Society of agrarian economists of Yugoslavia, Belgrade.
6. Milanović, M. (2002b): *Agrarian export as the expression of comparative efficiency of agroindustry*, Economic Annals, In „Economic and financial relations with foreign countries“, October 2002, Belgrade.
7. Milanović, M., Đorović, M. (2011): *Agricultural products market in Serbia (Monograph)*, Institute of Agricultural Economics, Belgrade.
8. Milanović, M. (2011): *Economic changes in reproductive vertical of oil industry in Serbia-long-lasting trends*, Industry, Vol. 39, No 4, Belgrade, pp 107-126.
9. Mičić, V., Zeremski, A. (2011): *Deindustrijalizacija i reindustrijalizacija privrede Srbije*, Industrija, Vol. 39, No. 2, Beograd, pp. 51-68.
10. Pelević, B. (2004): *Introduction to the international economy*, Faculty of Economics, University in Belgrade, Belgrade.
11. Savić, LJ. (2009): *Srpska industrijalizacija za dvadesetprvi vek*, Industrija, Vol. 37, No. 1, Beograd, pp. 1-17.
12. Stevanović, S., Đorović, M., Milanović, M. (2011): *Market as „an invisible hand“ or state interventionism as „a visible hand“ of economic policy*, Economics of Agriculture, Vol. 58, No 3, Belgrade, pp. 371-386.
13. Stevanović, S., Milanović, M., Milačić, S. (2013): *Problems of the deindustrialization of the Serbian economy*, Economics of Agriculture, Vol. 60, No 3, Belgrade, pp. 465-477.
14. Šoškić, D. (2009): *Privredna struktura posle tranzicije*, Zbornik radova “Tranzicija u Srbiji”, Faculty of Economics in Belgrade, Belgrade.
15. Vučković, V. (2010): *Deindustrijalizacija i reindustrijalizacija*, <http://www.blic.rs/Vesti/Ekonomija/210969/Deindustrijalizacija-i-reindustrijalizacija> 9th October, 2010; Blic.
16. Statistical Office of the Republic of Serbia, Belgrade, *Billten Industry*; data bases: [www.statserb.gov.rs](http://www.statserb.gov.rs).
17. <http://www.imt.co.rs/Istorija.php>.



## AGRARNI POTENCIJALI U REINDUSTRIJALIZACIJI SRBIJE - potrebe i mogućnosti revitalizacije industrije agrarnih inputa -

*Milan R. Milanović<sup>6</sup>, Simo Stevanović<sup>7</sup>, Bojan Dimitrijević<sup>8</sup>*

### Rezime

*Nakon tranzicionih neuspeha i promašaja, strukturne degradacije i recesije, reindustrijalizacija se nameće kao nužna etapa u privrednom razvoju Srbije. Proizvodno-tržišni potencijali agrokompleksa (kao složenog privrednog sistema predfarmskih, farmskih i postfarmskih delatnosti) i njegovo mesto u nacionalnoj ekonomiji, otvara značajne mogućnosti revitalizacije industrija agrarnih inputa (poljoprivrednih mašina i opreme, mineralnih đubriva i pesticida). Sagledavajući strukturni značaj predfarmskog agrarnog sektora u srpskoj ekonomiji, u radu se analiziraju osnovna obeležja proizvodnje i spoljnotrgovinske razmene, posebno dinamika i promene obima i strukture proizvodnje i uvoza agrarnih inputa. Na toj osnovi se, ciljnom komparativnom analizom višegodišnjih serija podataka (1986-2011), u radu se istražuju trendovi proizvodnje i zaposlenosti, identifikuje uvozna zavisnost, sagledavaju agrarni potencijali u mogućoj reindustrijalizaciji i ukazuje na poseban fenomen oportunitetnih troškova agrarnog razvoja Srbije.*

**Ključne reči:** *poljoprivreda, agrarni inputi, uvozna zavisnost, oportunitetni troškovi.*

---

6 Redovni profesor, dr Milan R. Milanović, Megatrend Univerzitet, Fakultet za državnu upravu i administraciju, Ulica Goce Delčeva br. 8, 11070 Beograd, Republika Srbija, Telefon: +381 11 22 03 029, E-mail: [mmilanovic@megatrend.edu.rs](mailto:mmilanovic@megatrend.edu.rs).

7 Redovni profesor, dr Simo Stevanović, Univerzitet u Beogradu, Poljoprivredni fakultet, Ulica Nemanjina br. 6, 11080 Beograd, Republika Srbija, Telefon: +381 11 44 13 418, E-mail: [simo.stevanovic@agrif.bg.ac.rs](mailto:simo.stevanovic@agrif.bg.ac.rs).

8 Docent, dr Bojan Dimitrijević, Univerzitet u Beogradu, Poljoprivredni fakultet, Ulica Nemanjina br. 6, 11080 Beograd, Republika Srbija, Telefon: + 381 11 44 13 336, E-mail: [bojandi@agrif.bg.ac.rs](mailto:bojandi@agrif.bg.ac.rs)