

## SIGNIFICANCE OF FACILITIES IN OPERATIONS MANAGEMENT FOCUSED ON AGRICULTURE

Pakurár M.\*

\*University of Debrecen Agricultural Centre

### **Abstract**

*The importance of facilities was examined using statistical data and information from enterprises in Hungary. The significance of facilities can be described partly by the share of facilities in the enterprise assets. 58-62% of domestic investments were made in constructions. Construction investments were 4.2-5.3% of the gross domestic product. The highest value was invested in two categories: highways, streets and roads; and industrial buildings and warehouses. Investment in agricultural buildings was close to domestic average if its comparison is based on the GDP of three years (2003-2005). The importance of share of facilities in the assets of enterprises can be quantitatively demonstrated. However to conform that facilities are planned and managed properly, individual examination of each enterprise is needed.*

**Key words:** investment, current prices, management, cost databases

### **INTRODUCTION**

Facilities are constructed for a significant time period and their location and layout can not changed easily. "Any publicly or privately owned building, works, system, or equipment, built or manufactured, or an improved and maintained natural feature. Land used for agricultural purposes is not a facility." ([www.fema](http://www.fema)). Modification of location or layout characteristics may be rather expensive. Therefore facilities planning have a long-lasting impact on the performance of a business (Russel and Taylor, 2003). When facilities are planned the demand of the customer should be in the center. An enterprise is a member of a supply chain which begins with raw materials and, through the chain of enterprises, ends at the final customer (Szabó, 2001). The satisfaction of the customer depends on the performance of the supply chain. A supply chain operates successfully if the activities of its members are efficient and well coordinated (Szegedi and Prezenszki, 2003). The facilities of supply chain members should fit into the chain and focus on the demand of the final customer.

Facilities could contribute to profitable production and service many ways effecting both quality and quantity (Tompkins et al., 2003). Movement of materials and people, labor efficiency, material handling, space utilization, flow of work, completion time, communication, production and service flexibility, work safety, security, maintenance are the most important factors that can be altered by the facility layout (Tompkins, 1989).. The facility layout design depends partly on the type of production or service. In

production process layouts, product layouts, fixed position layouts and hybrid layouts are used. Retail layouts and office layouts are popular examples of service providers' layout solutions.

Chase et al. (2006) listed the marks of a good layout for manufacturing and back-office operations as follows: straight line flow pattern, minimum backtracking, predictable production time, little in process inventory, open plant floors, no bottlenecks, close-together workstations, avoidance of rehandling materials, orderly handling and storage of materials, and flexibility to changing conditions.

For face-to-face services the marks for a good layout are: service flow pattern can be understand easily, appropriate waiting facilities, easy communication, easy customer surveillance, clear exit and entry points with checkout capabilities, customers attention is directed, balance between waiting areas and service areas, minimum material movement, lack of clutter, and high sales volume per facility area (Bitner, 1992).

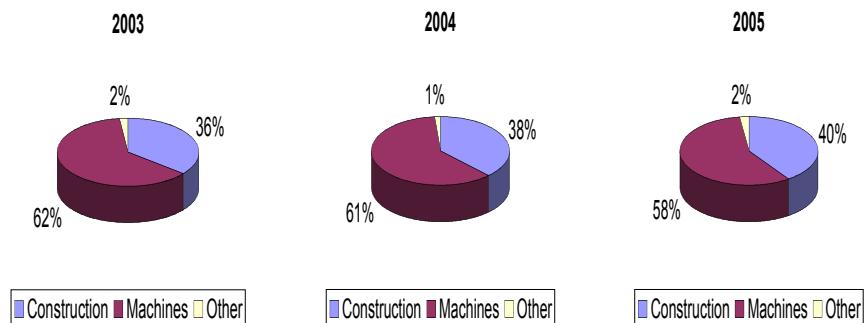
Demonstration of the significance of facilities in operations management can be approached many ways. One way is to show the importance of facilities to analyze the rate of investment into facilities.

## MATERIALS AND METHODS

Data of investments were collected from the publications of Hungarian Central Statistical Office and from managers of enterprises of North Great Plain Region of Hungary. Questionnaires were constructed to interview business persons for the project which is financed by the Regional Development Operative Program. Statistical data and collected data from enterprises were evaluated using tables and graphs (Berde et al., 2001).

## DISCUSSIONS

58-62% of investment of the national economy was spent on machinery by corporations and unincorporated enterprises in 2003-2005 (Figure 1). The second biggest investment, 36-40%, was made into constructions in the similar time period. The structure of investments did not change greatly from 2003 to 2005.



**Figure 1. Investments of the national (Hungary) economy by categories, at current prices, corporations and unincorporated enterprises** (*Source: Hungarian Central Statistical Office, 2006*)

Investments can be expressed as percentage of the gross domestic product of a country. Using these indexes investments of different regions or countries can be compared. Construction investments as percentage of GDP were 4.24-5.32% (Table 1). Construction investments significantly increased from 2003 to 2005. Construction investments were far behind the US average. In the United States 8% of gross national product has been spent annually on new facilities since 1955. The cost of new facilities and maintenance cost of facilities indicate their importance.

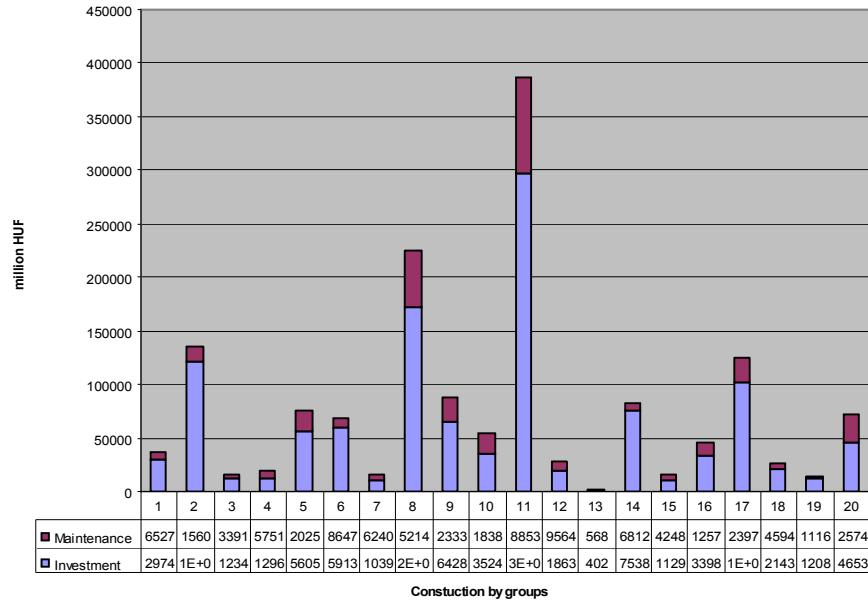
*Table 1*  
**Construction investments as percentage of GDP in Hungary**  
*(Source: Hungarian Central Statistical Office, 2006)*

	<b>2003</b>	<b>2004</b>	<b>2005</b>
GDP total, at current prices, billion HUF	18935,7	20712,3	22026,8
Construction investment, at current prices, million HUF	802885	970949	1172874
Construction investments as percentage of GDP	4,24%	4,69%	5,32%

Construction investments in highways, streets and roads were the highest in Hungary in 2005 (Figure 2). The next three biggest investments were made in industrial buildings and warehouses, two- and more dwelling buildings, and local pipelines and cables.

Denominations of construction groups in Figure 2:

1. One-dwelling buildings
2. Two- and more dwelling buildings
3. Residence for communities
4. Hotels and similar buildings
5. Office buildings



**Figure 2 Construction activities by groups of structures, 2005, at current prices**  
*(Source: Hungarian Central Statistical Office, 2006)*

6. Wholesale and retail trade buildings
7. Traffic and communication buildings
8. Industrial buildings and warehouses
9. Public entertainment, education, hospitals, or institutional care buildings
10. Other non residential buildings
11. Highways, streets and roads
12. Railways
13. Airfield runways
14. Bridges, elevated highways, tunnels, and subways
15. Harbors, waterways, dams, and other waterworks
16. Long-distance pipe lines, communication and electricity lines
17. Local pipelines and cables
18. Complex constructions on industrial sites
19. Sport and recreation constructions
20. Other civil engineering, works not elsewhere classified

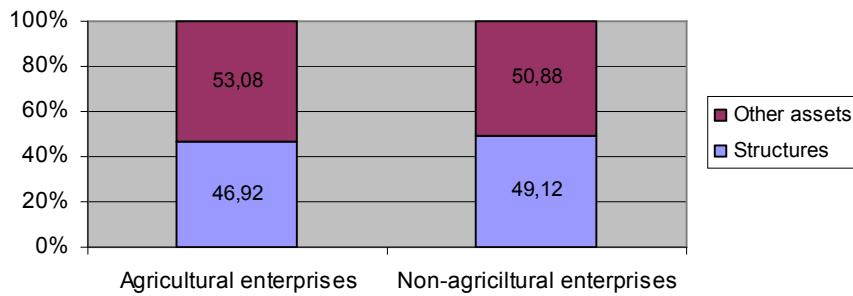
Agricultural facilities can be characterized by GFC (gross fixed capital formation) in buildings. Both domestic investment and agricultural GFC in

buildings showed a dynamic increase in the past three years (Table 2). As the share of GDP of domestic agricultural production is about 4.3-4.8 percent in 2003-2005 and 4.6-5.3% of all construction investment was GFC in buildings by the agricultural sector it can be stated that agricultural investment in buildings was slightly higher than the domestic average.

*Table 2*  
**GFCF in buildings, agriculture, as percentage of construction investment in Hungary**

	<b>2003</b>	<b>2004</b>	<b>2005</b>
Construction investment, at current prices, million HUF	802885	970949	1172874
GFCF in buildings, at current basic prices, agriculture, million HUF	42739	45536	54037
GFCF in buildings, as percentage of construction investment	5,32%	4,69%	4,61%

In the frame of a research project called „Regional Development Operative Program. (ROP-3.3.1.-2005-03-0003/37)” which is partly financed by the EU and the Hungarian government questionnaires were sent to regional entrepreneurs to collect information about facility management. They were asked to determine the share of structures value as percentage of business assets. Structures’ value was 46.9% of the total asset value at agricultural enterprises and 49.1% at non-agricultural firms. These high values are proofs of the importance of facilities in businesses. While it is relatively easy to demonstrate the importance of facilities as part of business assets the effect of facility location and layout on the profitability is a much more difficult question. In order to determine if a facility is located and laid out properly individual examinations are needed to highlight the problem. Based on the information collected from 33 enterprises it is assumed that facilities are not well planned since managers do not know facility location and layout techniques. Therefore the management cost of facilities may be higher and the performance of enterprises may be on a lower level than they should be. To facilitate proper planning and later a professional management of facilities managers need to understand the basics of facilities planning and facilities management techniques. These topics should be incorporated into the curriculum of business, management and engineering students.



**Figure 3. Importance of value of structures at agricultural enterprises (n = 13) and non-agricultural businesses (n = 17) in the North Great Plain Region**

## REFERENCES

1. Berde Cs. – Berki S. – Dienesné K. E. – Juhász Cs., 2001, Vezetési interjük értékelése. XLIII. Georgikon Napok „Vidékfejlesztés – Mezőgazdaság” című tudományos konferencia kiadványa. Keszthely. 608-613.
2. Bitner, M. J., 1992, Servicescapes, The Impact of Physical Surroundings on Customers and Employees, Journal of Marketing 56 pp. 57-71.
3. Chase R.B. – F.R. Jacobs – N.J. Aquilano, 2006, Operations Management for Competitive Advantage, McGraw-Hill, New York.
4. Hungarian Central Statistical Office: (2006) Statistical Yearbook of Agriculture 2005.
5. Hungarian Central Statistical Office: (2006) Statistical Yearbook of Hungary 2005.
6. Szabó B., 2001, Sub-regional Experiences in the SAPARD-Programme in Hungary. Symposium, Prospects for the 3<sup>rd</sup> Millennium Agriculture, Cluj-Napoca.
7. Russel R.S. – B.W. Taylor, 2003, Operations Management, Pearson Education, Inc., New Jersey.
8. SZEGEDI Z. - Prezenszki J., 2003, Logisztika-Menedzsment. Kossuth Kiadó.
9. Tompkins J.A. – J.A. White – Y.A. Bozer – J.M.A. Tanchoco, 2003, Facilities Planning, John Wiley & Sons, Inc.
10. Tompkins J.A., 1989, Winning Manufacturing: The How To Book of Successful Manufacturing, IIE, Norcross, GA.
11. [www.fema.gov/rrr/pa/glossary.shtml](http://www.fema.gov/rrr/pa/glossary.shtml)