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ANALYSIS OF THE EXISTING PRODUCTION TECHNOLOGIES LEVEL IN WOOD PROCESSING INDUSTRY AND SPECIFICATION OF NEEDS

-SUMMARY-

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EXECUTIVE SUMMARY

a) ANALYSIS OF THE EXISTING CAPACITIES AND STRUCTURE OF PRODUCTION TECHNOLOGY IN WOOD PROCESSING SECTOR

- Wood processing industry in Bosnia and Herzegovina has important place and it is recognized as a strategic sector for economic growth.
- Bosnia and Herzegovina, as one of the most afforested countries in Europe, has secured raw material basis for development of wood processing operations.
- Until 1992, Bosnia and Herzegovina had reached a high level of development of wood processing industry. Intensive investments in this sector started in 50's and 60's of 20th century with investments into furniture and value added production. Up to that time practice of domination of primary wood processing and law value products production was ceased and trade balance of wood processing industry in BiH became positive. The export was most often realized on U.S. market, but on the markets of present EU, Easter Europe, some African countries, countries of Middle East and Australia, as well.
- Main characteristics of firms established in the mentioned period are large number of employees, large installed capacities and high-level serial production.
- The firms were organized in conglomerates which covered both forestry and wood processing and had the entire production process from primary to final processing.
- The installed capacities largely exceeded the needs of local market and firms were export oriented.
- During 1990's the conglomerates ceased with their operations, the infrastructure and technological capacities of the conglomerates were destroyed, aged or damaged due to lack of usage or maintenance, forestry and wood processing operation were separated, and the production process was divided into phases what lead to disproportion in raw material demand and supply. Big conglomerates were torn into peaces and privatized in not the best way due to the lack of a strategic partner, markets were lost and significant fall behind the highly developed countries in respect to development and monitoring of product quality occurred. The established image of BiH products was significantly impaired. With the rapid development of private sector once again the domination of primary processing over final processing was established, where the installed capacities are small, technological level of processing is low and quality of products questionable. Gray economy in wood processing sector is very much present what additionally makes systematic solution of the problem in this sector difficult.
- Today, multipurpose machines dominate firms in wood processing sector (64,8% out of the entire machinery). Followed are specialized machines (13,8%), automatic (6,8%) and other machines (7,4%).
- Out of all mentioned machines in primary wood processing multipurpose machines are dominant with 93% , while the other types of machines make the remaining 7% of the overall machinery in primary wood processing firms. It is necessary to stress the significant share of mechanization and transport resources in the area of primary wood processing.
- Construction joinery production requires higher level of wood processing thus the structure of machines is somewhat more complex in comparison to primary wood processing. Multipurpose machines make 82% of the total machinery and the rest are automates (6%) and specialized machines (12%).
- In the production of other wood products recorded are also machines of higher level of complexity as well as the lowest share of multipurpose machines (only 42% of entire machinery are multipurpose machines). The specific nature of production process and high level of final processing of products imply more complex machinery what was confirmed by the results of the research as well.
- In furniture production registered is the presence of all types of machines where

multipurpose machines are dominant (54% of the entire machinery of furniture manufacturing firms). Specialized machines make 18% of the entire machinery of firms in this sector while automatic (8,5%) and other machines (9%) are equally represented. Also noted are CNC and NC machines and an unsatisfactory level of presence is noted in the case of Machining Centers and Flexible Machining Centers and transfer of production lines (6%) that is recorded only in firms which manufacture furniture.

- CNC and CN machines are present in firms with value added production (furniture production, production of other wood products, beams and production of construction joinery).
- On average, the biggest share of machines by a firm is present in primary wood processing and production of construction joinery where multilevel machines dominate, and also registered is the lack of new technologies and great share of labor force in production process. With the increase of the level of complexity of machines the number of individual technological operations and human factor role are decreased, while production capacities, production speed, precision of manufacturing, possibilities for quality control, etc. are increased. Especially visible advantage of usage of new technologies is in final wood processing.
- Related to the age of machines noted was the range of 57 years (the oldest machine was manufactured in 1948) what speaks of disequilibrium of machinery in wood processing sector.
- The most obvious difference in the age of machinery is present in relation to organizational type of firm. Average age of machines in join-stock companies is 19,61 years while in limited liability companies it is 13,1 years. Sole craftsmen shops have machines of average age of 15,45 years. Most probable reason for this situation is stagnation of large wood processing conglomerates before the privatization process where renewal of machinery is neglected while limited liability companies are often smaller firms where owners and management recognized the importance of modernization of production technologies in order to increase firm’s profitability and invested in the same. Management of firms registered as join-stock companies due to decreased or shut-down production and limited possibilities to invest in maintenance of machines often decided to sell those, thus the older machines can often be found in sole craftsmen shops and somewhat rarely in limited liability companies where mostly we found firms that are established in the last 10 years.
- In relation to business operations, the machinery in furniture manufacturing firms is slightly younger in relation to other operations of wood processing namely due to sudden increase of the number of firms dealing with production of board furniture where it was often invested in new technologies. Due to the presence of considerably old machines (more than 30 years) without proper maintenance it was also necessary to change part of the machinery in furniture production sector in order to continue with the process of production of market competitive products.
- In a more detailed analysis of data related to the age of machines, a trend of investing into new technologies in different periods can be noted. In 1980-1985 period most machines registered in this research were manufactured thus, on average, every wood processing firm has at least 2 machines manufactured in this period. On average, every second wood processing firm has a machine manufactured in 1990, while machines manufactured in the period 2000-2005 are slightly less in use in relation to the machines manufactured in the period 1980-1985.
- Furniture production has the most diverse structure of machines in relation to the age of machines where the presence of both older and newer machines is important.
- In machines for construction joinery production it was invested the most in the period 1985-1990, and in 1995, but in the last 10 years the investment trend decreased.
- Investments into machinery in sawn timber production were the most intensive in 1998-2004 period, meaning that the biggest number of machines manufactured in the mentioned period was noted. The oldest machines in primary wood processing date from 1963.

- In production of other wood products noted are machines manufactured in 1948 and considerable number of machines was manufactured in 1970, as well. Also noted were investments into new machines manufactured in 2000 or later. A trend of increased investments into machinery in this sector in a specific period was not noted, meaning that the structure of machines by year of manufacturing seems not to be planed.
- In furniture production it was necessary to divide the subcategories of board furniture production, production of upholstered furniture and production of solid furniture. The most intensive investments were made in the area of board furniture, upholstered furniture mainly comes down to mostly manual work and investments into machines are rarely made, while the least investments in renewal of machinery were made in solid furniture production. Considering furniture production in the three mentioned subcategories it can be deduced that the most intensive investments into machinery were made in different periods which are 1980-1985, 1990, 1996-1998 and 2004-2005.
- Italian manufactures are dominant with 35% of manufactured machines present in wood processing sector in FBiH. Germany follows with 22% of manufactured machines present on FBiH market. Countries of former Yugoslavia are significantly present, especially manufactures from Croatia (9,5%), Slovenia (8,3%), Bosnia and Herzegovina (7,8%) and Serbia and Montenegro (2,2%) what makes the total of 27,8% of noted machines.
- Apart from the mentioned ones, as countries of origin of the machines found are the following: Austria (2,3%), Belgium and USA (each 1,5%), Switzerland (1,3%) and Sweden, England, Czech Republic, China, Japan, etc.
- Noticeable is a great difference of machine manufacturers noted in this research. Total of 119 different manufactures of machines were recorded.
- SCM Group of manufactures from Italy dominates with 13% of manufactured machines present in wood processing industry in FBiH. Besides SCM Group, also evident are Bratstvo Zagreb (8,7%) Weinig Group (6,1%) and machines of their own production (5,2%). Also recognized are machines of the following manufactures: Sikar (3,4%), Homag Grupe (2,8%), Mebor (2,8%), Biesse (2,7%), and Linck (2,5%), Simipianti (2,2%) and many others.

b) ANALYSIS OF THE EXISTING NEEDS FOR NEW TECHNOLOGIES IN WOOD PROCESSING SECTOR IN FBIH

- Only 25,5% of firms expressed needs for one or more machines. Relatively small number of needs expressed is a result of many factors among which the following come forward: lack of planned firm's operations, inability to anticipate future needs, lack of considering the expending or specification of production, lack of secure market, unfavorable financial situation, preparation for VAT introduction as of January 2006 where the accumulation of working capital is the most proper way of firm's preparations, and complete production process due to increased investments in the last 10 years (especially limited liability companies that make around 50% of samples).
- Positive aspect of this result is that 74,5% of wood processing firms have already dealt with the issues of lack of machines and they have completed the process with investments of different types in the last 10 years, while the newly established firms planned the needs well at the very start and avoided the issues of lack of machines.
- Most needs were expressed in the production of other wood products (38,5% of firms in this area expresses the need for one or more machines) and in furniture production (22% of firms in this area). The least needs were expressed in production of construction joinery where only 9,5% of firms expresses a need for new machines.
- In relation to the type of organization, the most needs were expressed in join-stock companies (50%) what is expected since the average age of machines in the firms of join-stock company type is 19,61 years. On the other hand, privatized large state-owned firms are usually of the organizational type of join-stock company in which only after the privatization process is finished the significant investments into new production capacities

begin. The difference is significant in relation to sole craftsmen shops and limited liability companies where every fifth firm expressed a need for a machine.

c) RESEARCH OF THE EXISTING EAR-MARKED FUNDS/PROGRAMS FOR NEW TECHNOLOGIES IN WOOD PROCESSING AT STATE, ENTITY, CANTONAL AND MUNICIPALITY LEVEL AND RECOMMENDATIONS FOR THEIR USAGE

- In FBiH there are no ear-marked funds for new technologies in wood processing sector. Funds are most often directed to all legal entities, and rarely to production sectors and very rarely to a specific group of operations.
- Recorded are three funds partially directed to the existing stimulations for introduction of new technologies in wood processing and those are: FBiH Government, FBiH Government, Federal Ministry of Energy, Mining and Industry, FBiH Government, Federal Ministry of Development, Entrepreneurship and Crafts and Zenica-Doboj Canton, Ministry of Economy.
- FBiH Government has invested financial resources amounting to KM 1.605.000,00 from the budget of BiH Federation based on the item “Current transfers – Transfer for restructuring of industry and mining”. The ear-marked structure of the mentioned funds is to extend production program and increase production capacities, change technology and increase the number of employees (KM 1.480.000,00), organization of scientific and expert symposiums and stimulation to research work (KM 50.000,00), and procurement of laboratory equipment for adoption and development of new methods (KM 75.000,00). Not one recipient of this fund is from wood processing sector.
- Federal Ministry of Development, Entrepreneurship and Crafts within a public tender for selection of beneficiary of funds “Transfer for stimulation of entrepreneur and craftsman development” for 2005 awarded the funds to 250 beneficiaries in 7 lots out of which only 9 beneficiaries are from wood processing sector.
- Stimulation measures of Zenica-Doboj Canton are: allocation (refunding) of stimulation funds intended for refunding interests on investment loans; allocation (refunding) of stimulation funds intended for subsidizing administrative costs of production investments (building production facilities), and allocation of funds for introduction of quality management system according to the requests of ISO 9001 via award for quality.

d) ANALYSIS OF TECHNOLOGY NEEDS, GROUPING FIRMS WITH SIMILAR NEEDS FOR PRODUCTION TECHNOLOGY TO IMPROVE THEIR COMMON APPROACH TOWARDS EQUIPMENT SUPPLIERS

- Total of 26 firms expressed the needs for 28 different machines. Wide range of machines that lack in relation to the purpose of machines but also the price indicates the lack of possibility of grouping firms in relation to the needs for production technologies.
- There is a large diversity in defining those production capacities that lack.
- In solid furniture production recorded are the needs for introduction of new CNC technologies for production of turnery products, for varnishing lines, machines for shaving, wide-belt sanding machine, dowel hole boring machine and presses for side joint gluing. Also limited are capacities for drying and presses for edge joint gluing.
- In board furniture production most often there is a lack of edge banding machine, sawing machine for wood –based panel, and CNC machining centers (CNC boring machine).
- In the area of production of construction joinery the most noticeable problem is the lack of pneumatic presses, four-side planning machines, then machining centers, machines (tables) for hardware inserting and varnishing facilities.
- In primary wood processing recorded is the lack of capacities for drying, steamers, then silos for scraps, different sawing machines, etc.

e) ANALYSIS OF A POSSIBILITY TO INTRODUCE INCENTIVES FOR FIRMS INVESTING INTO NEW PRODUCTION TECHNOLOGIES

- As the ear-marked funds do not exist, cluster activities could be directed towards establishing such a fund.
- Apart from the mentioned three funds (FBiH Government, Federal Ministry of Energy, Mining and Industry, FBiH Government, Federal Ministry of Development, Entrepreneurship and Crafts and Zenica-Doboj Canton Government, Ministry of Economy), Government of Middle Bosnia Canton, Ministry of Economy of Middle Bosnia Canton also has financial resources at annual level amounting to KM 700.000,00 for 2005 earmarked for stimulation of purpose but for which there is no good quality program.

f) ANALYSIS OF THE EXISTING NON-EXPLOITED CAPACITIES FOR FINAL AND SEMI-FINAL PRODUCTION OF WOOD AND RECOMMENDATIONS FOR THEIR USAGE

- Noticeable is disproportion of employed capacities in different categories of wood processing.
- The biggest utilization of machines is in the production of board furniture where the biggest number of installed capacities is utilized 80-100%. Significant investments are needed for increasing capacities of these operations.
- The smallest utilization of machines is in the production of construction joinery where the situation is just the opposite in relation to production of board furniture. Most machines are used 0-20% of installed capacities. Much less investments is needed in this area to increase the level of utilization of machinery.
- Machines in primary wood processing are most optimally utilized where machines on average are utilized around 80% of installed capacities. Significant investment is not needed in order to increase utilization of installed capacities to 100% (in relation to other wood processing areas).
- The biggest possibility to increase utilization of machines is in production of solid and upholstered furniture. In these areas, the imbalance is most obvious in utilization of capacities where significant number of machines is utilized less than 20% but approximately the same number of machines is utilized 80% or more of installed capacities. This data indicates the problem which this sector faces and for whose solution considerable financial investments are needed.

g) DEFINING A TRAINING RELATED TO NEW PRODUCTION TECHNOLOGIES THAT WILL IMPROVE THEIR IMPLEMENTATION IN FIRMS

- In 59% of firms additional training of workers has already been performed. Least performed trainings of workers is in firms dealing in production of other wood products. Two thirds of firms operating in production of construction joinery have already performed additional training of workers.
- The need for additional training of workers is present in 39% of firms.
- The need for training of workers is most notable in primary wood processing and in furniture production where, at the same time, there are most nonqualified workers.
- Training for new workers lasts from 7 days to 6 months.
- Non-verified training of workers of other occupations is conducted in firm’s premises and is monitored by a mentor and lasts 6 months.
- Training for operating machines is conducted according to agreement in cooperation with machine manufacturers and via already trained workers in either firm’s premises or in headquarters of manufacturers.
- Noticeable is the problem of difficult retraining and additional training of workers.

- The most active in rendering expert trainings to firms from wood processing sector are: Mechanical Faculty Sarajevo and Šumaprojekt, then Mechanical Faculty Zenica and Institute for Economy Engineering in Zenica.