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DIAGNOSTIC STUDY CLUSTER

"PRODUCTION OF SAWN TIMBER"

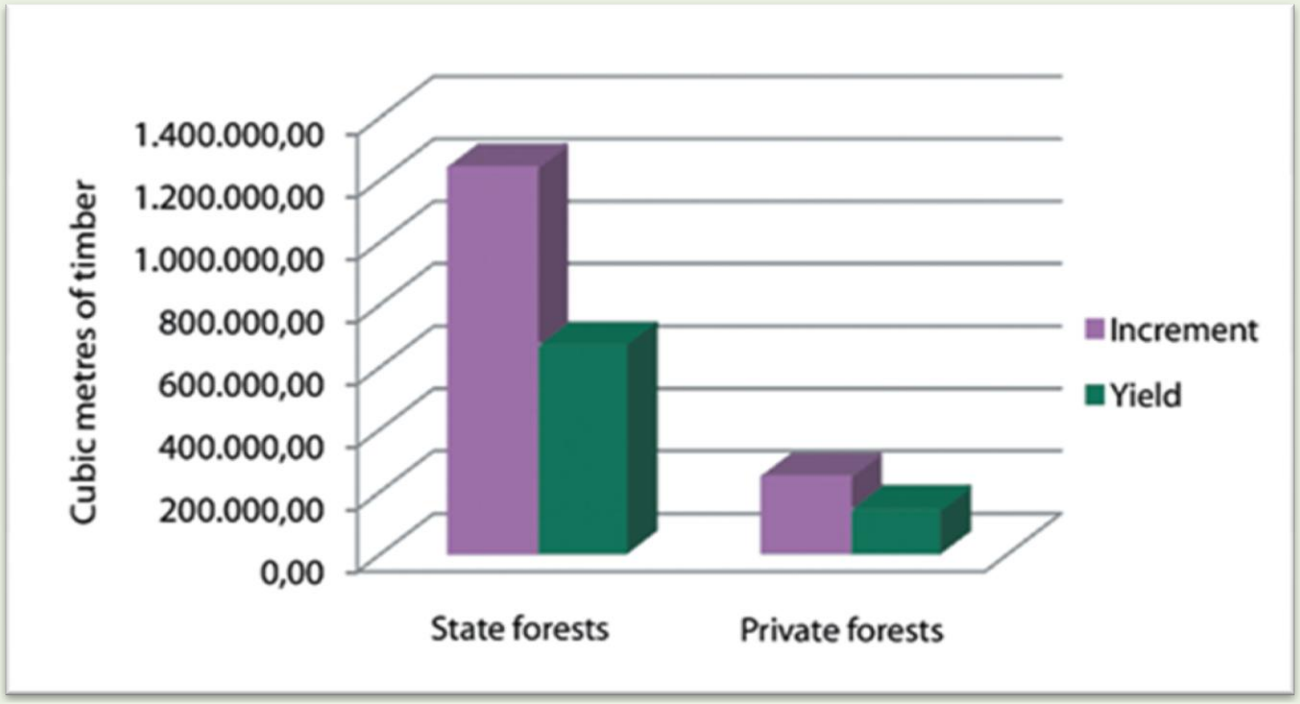
Municipality of Mojkovac

TABLE OF CONTENT

I. NATIONAL CONTEXT

Forest resources are amongst the most valuable resources that Montenegro possesses, especially in the northern region. The total size of the Republic of Montenegro is 1,381.200 ha, of which, according to the statistical indicators 743,609 ha (**54% of the total surface**) is covered by forests and forest land, and about 60% of the population is connected to villages and areas that are rich in forests. Out of the total forest area, 67.25% belong to the state while 32.75% are in private hands. Of the total forest territory which belongs to the state, 81.43% are commercial forests, 15.53% are protected areas, and 3.04% represent the forests that formally belong to national parks. The **tree population** in Montenegrin forests consists of conifers (40.89%) and broad-leafed trees (59.02%).

Graph: Total annual increment and yield



Source: *Ministry of Agriculture & Rural development, National Forest Policy of Montenegro, p.15*

Every year, the Forest Administration (also referred to as Bureau for Forests) publishes a tender and gives **concessions** for the productive use of slightly more than 400,000 m^3 (2010). However, when adding the needs of the local population in terms of fuel wood, as well as retail and sanitary felling, this figure rises up to approximately **700,000 m^3 of harvested forests every year**.

Nevertheless, Montenegro experiences a substantial natural expansion of forest areas, which results from not only artificial reforestation, but also from the spontaneous expansion of forest vegetation at the expense of agricultural land.

All activities in the area of forest management are conducted by the **Directorate of Forests** under the Government of Montenegro, which obtains revenues/income from (-) concession fees for the use of forests, (-) the sale of forest products, and (-) fees paid by owners of forests. 10% of the revenue obtained from concession fees belongs to the respective **local governments** (depending on where the forest is located), which use this income for the construction of rural infrastructure facilities in areas where forests is used (roads, water, electrification, etc...). Other means used by the program must be approved by the Central Government.[1]

The main long-term national priority, which lies behind initiatives that aim to develop wood processing industries in Montenegro, is to foster the development of small and medium sized enterprises urban and rural areas.

Production capacity of the wood industry in 2009[2] includes:

→ 400,000 m^3 of sawn timber;
→ 47,000 m^3 of dried lumber;
→ 21,000 m^3 of steamed lumber;

[1] Forest Law, Article 58.
[2] Municipality of Mojkovac

- → 5,000 m^3 of veneer;
- → 810,000 m^2 of paneling and decking;
- → 145,000 of carpentry units;
- → 25,000 of units of furniture;
- → 20,000 m^2 of prefabricated houses;
- → 50,000 m^3 of particleboards;
- → 4,800 m^3 of panels;
- → 5,000 m^3 of lamed plate;
- → 3,000 m^{3}of plywood;
- → 20,000 m^3 of impregnated sleepers.

Sawn timber presents 25% of the total production capacity of the wood industry in the country. Bearing in mind that 53 firms in the Durmitor region are involved in the production of sawn timber and that 65% of the total number of companies in that region that are engaged in wood processing, it is concluded that there is potential for timber production in terms of natural resources as well as manpower.

The figures show that the existing potential in not fully used and that there is space for further utilization of timber capacities in the Durmitor region.

There is wide spread public awareness that the abundance of forests and forest lands must be managed in the manner that respects the social, environmental, economic, cultural and other needs of present and future generations; hence continued efforts to raise social awareness about the destruction and degradation of forests is crucial to ensure that consumers who are buying wood products will not contribute to destruction, but rather help preservation of the forest wealth for future generations.

In addition, the **National Forest Policy on Montenegro** places strong emphasis on forestation and cultivation of forests as those activities are crucial for forest conservation.

II. MOJKOVAC (MUNICIPAL) CONTEXT

Mojkovac is the city and the center of the eponymous municipality in Montenegro, which is located in a valley of Tara in the foothills of the mountains Bjelasica and belongs to the Northeastern part of the country. It is encircled by national parks Biogradska Gora and Durmitor. It covers an area of 367 km^2 and hosts around 11,000 inhabitants. The Municipality of Mojkovac disposes of 12,398.90 hectares of state forest, 2,863 hectares of private forest and 3,733 hectares of bare land (which is considered as forest land), which all together amount to **18,994.90 hectares of forests**.[3]

Mojkovac - Position on the map of Montenegro

In total, **20 firms** are engaged in timber processing in the territory of Mojkovac. Most of them (15 firms) are focused on the production of sawn timber, while 3 firms produce joinery and furniture and 2 companies engaged in wholesale timber trade. All together, wood industry in this municipality **employs 99 individuals**. Having in mind that employment in this sector is based on full-time jobs, revenues that are generated in this way represent the main family income for the workers. According to ISSP estimations, **52 households** in Mojkovac are dependent on timber production.

In 2010, the regional unit of the Forest Administration (Directorate for Forests) in Mojkovac launched a tender and made available **concessions** for the utilization of 12,398.90 hectares of state forest. Each company applies individually for a concession - there is no association or cooperation in this area. Those concessions are given for a period of 7 or 11 years. Currently, there are two concessionaires in the territory of Mojkovac - LTD Trudbenik and LTD Vukman Kruščić. The table below shows three concessions - two of them were obtained by the same company LTD "Trudbenik", in different periods.

[3] Source: Directorate for Forest

Table: *Report on performance of forest concessions in Municipality of Mojkovac*

SUBORDINATE UNIT	No. FARM UNIT	CONCESSIONAIRE	ANNUAL GUIDANCE VOLUME, m3		∑	PRICE €	
			conifers	broadleaved		conifers	broadleaved
MOJKOVAC	1	**LTD,,TRUDBENIK"**	2,151	2,176	4,327	14.50	6.50
	1	**LTD,,TRUDBENIK"**	2,380	4,968	7,348	14.50	6.50
	1	**LTD,,V.KRUŠČIĆ"**	845	2,378	3,223	13.00	6.50

Source: Directorate of Forests

After reforestation/logging, those two companies sell raw material to other, smaller businesses. The price is set at the time of sale. The only mechanism of regulation in this case is the market.

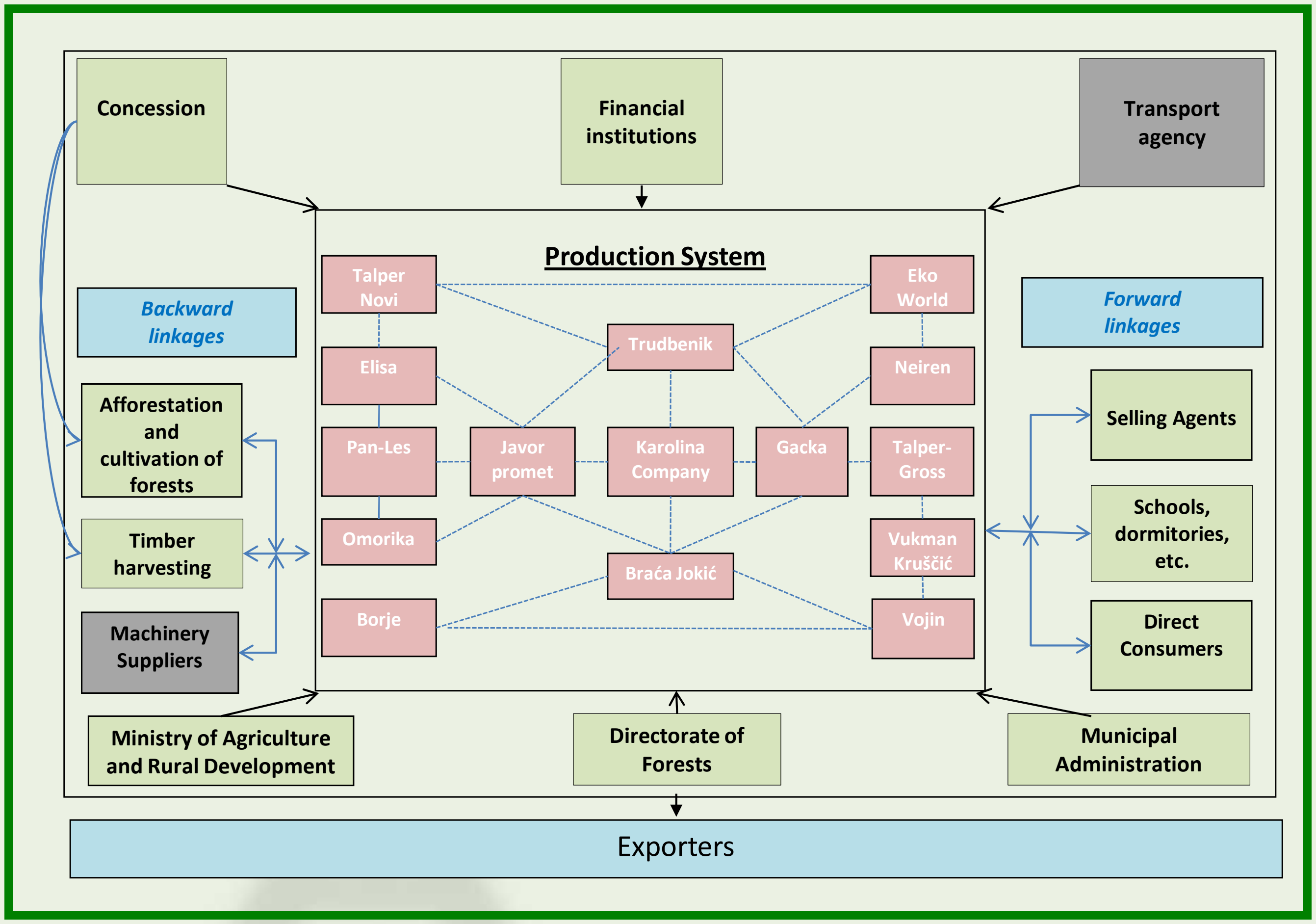
As stated above, the Municipality of Mojkovac counts 2,863 hectares of **private forests**. However, there is no data on what percentage of raw timber is coming from this source. Private forests are mainly used for obtaining wood for heating. Therefore, it can be concluded that the state forests are the primary source for wood processing firms.

Companies engaged in the production of **sawn timber** are producing at a fairly low stage of the value chain – primarily raw material and intermediate products with **little value added**. Raw material is sold to companies located in other parts of the country or exported to neighboring state, where it is further processed (and often times re-imported as final products). Intermediate products are usually sold as finished products (boards, rails, etc.) and to furniture producers. Taking into account the high **quality** of the wood, manufacturers usually do not face a problem to sell their goods on the market. The quality refers to the raw material as well as the intermediate product. However, due to obsolete equipment and lack of ideas and capacities for further processing, there is room for improvement when it comes to the quality of final products. Bearing in mind that the firms in this cluster are exclusively engaged in the production of sawn timber, wood quality can not be questioned.

III. DESCRIPTION OF THE CLUSTER

The Municipality of Mojkovac hosts one cluster focused on the "*production of sawn timber*".

Cluster scheme: Production of sawn timber



The above graphic illustrates the entire chain within the cluster and its linkages with other industries.

The first step involves obtaining a concession, which currently only two companies in the cluster managed: Trudbenik and Vukman Kruščić .

Backward linkages are presented through forestation activities and cultivation of forests, timber harvesting and machinery suppliers. Concessions are connected on the one hand with afforestation (afforestation allows the issuance of new concessions based on the forest regeneration capacity) and with timber harvesting on the other hand.

Within this cluster **15 firms** operate as separate units, which share common objectives (e.g. reduction of production costs, cheaper transport, distribution as well as marketing).

Those 15 firms are listed in the following table:

Table: Firms within the cluster „Production of sawn timber "

Firms from cluster		
Talper Novi	**Trudbenik**	**Eco World**
Elisa	**Karolina Company**	**Neiren**
Pan-Les	**Braca Jokic**	**Talper-Gross**
Omorika	**Gacka**	**Vukman Kruščić**
Borje	**Javor-Promet**	**Vojin**

According to classification, this cluster is **horizontal**. Firms are horizontally connected with each other, while through their value chains they are horizontally and vertically linked with certain companies that are engaged in activities that contribute to a better quality of raw materials supply, manufacturing and placement of the final product.

The beginning of the production chain for each company is marked by obtaining a **concession** for felling a certain number of trees. However, in the case of the Municipality of Mojkovac only two companies (Trudbenik and Vukman Kruščić) are holders of such a concession. Hence, the remaining firms have to buy their raw material from those two firms. The price for a concession varies depending on type of forest it is subject to. The average price for 1m^3 in conifer forests amounts to €13.75, while the price for broad-leafed trees reaches €6.5 per 1m^3. Those companies that do not have a concession pay high prices for the raw material. The average market price of sawn timber made out of broadleaves is €280/m^3. On the other hand sawn timber originating from conifers is more expensive and reaches a price of €330/m^3. Competing jointly for a concession would be a much more economical option for all of them.

Timber **harvesting** is being carried out by contracted workers from the Municipality of Mojkovac. Those two companies that are concession holders generally pay their own workers to engage in the timber harvesting. Sometimes, they also pay individuals (locals) on a daily basis to do the harvesting for them. Those are paid approximately €8/m^3.

Machinery suppliers to wood processers in the cluster include: Hudek (Zagreb/Croatia), Eurokancom (Nova Pazova/Serbia), and Service Group (Novi Beograd/Serbia).
Transport is organized in two ways: (1) cluster firms organize their transport individually, or (2) customers organize transport for their purchased products.

The **final product** (in this case the intermediate) is mostly sold to companies that are engaged in further wood processing and/or furniture production. It often happens that these products are bought by an individual carpentry workshop (as a raw material) or by selling agents. Also, households and other direct consumers (such are schools, dormitories and other private and public institutions) can be found on the list of **buyers**.

A number of **institutions** that directly, or indirectly, affect the development of individual firms in this cluster. Those include:

- ***Ministry of Agriculture and Rural Development***

The Ministry of Agriculture and Rural Development is the central authority of the state administration for agriculture, and also the central state authority responsible for forests, hunting, fisheries and water resources. With respect to forestry, its role is reflected by the implementation of the National Forest Policy of Montenegro, which was adopted in 2007.

The main elements and objectives of the National Forest Policy[4] include:

- → Provide and improve long-term resilience and productivity of forests and other ecosystems, and maintenance of plant and animal species;
- → Forest management and forest resources ensure a sustainable implementation of social, economic and environmental functions of forests;
- → Forests contribute to sustainable social and economic development of rural areas;
- → Provide long-term development and competitiveness of the wood industry;
- → The long-term development of forestry profession and forests.

[4] http://www.nsp-cg.com/?jezik=e

The National Forest Policy of Montenegro is of national character and hence does refer to individual municipalities.

- ***Directorate for Forests***

The Directorate for Forests is the state administration responsible for forest management. The core business of the Directorate includes measures and actions with a view to:

- Improve cultivation, protection and exploitation of forests,
- Adequate care,
- Conserve of and man-made forest values, and
- Protect of forests and forest land from encroachment and exploitation, fires, etc.

The Directorate for Forests is of relevance to the cluster firms when it comes to obtaining a concession. There is no another issue which connects this institution with the individual firms. Keeping in mind that only few firms are entitled to a concession approved by the Directorate for Forests, the interaction with the cluster is at a minimum level.

- ***Biotechnical Faculty (Forestry department)***

The Biotechnical Faculty originates from the Biotechnology Institute, one of the oldest research institutions in Montenegro and one of the founding bodies of the University. The organizational structure of the Biotechnical Faculty counts with a department dealing with forestry related issues, which was set up as a scientific research unit. The so-called Centre for Forestry was set up under the umbrella of the Institute of Biotechnology in 1998th.
This is the only specialized scientific-research unit dealing with issues related to forestry in Montenegro. Scientific research in the Centre is currently carried out by three Masters of Science, who are engaged in projects in the field of environmental protection, forest management planning and nurseries.
In the past, the Centre for Forestry participated in the implementation of the following projects:

- → Study of the major diseases of spruce in natural stands in Montenegro
- → Forest types in National Park Biogradska Gora
- → Vulnerability and protection of coniferous forests in the northern forest area of Montenegro
- → Diseases of sweet chestnut
- → Methods of management of mixed forests of beech, fir and spruce in Ljubišnja
- → The program "Monitoring of forest dying"

At the end of 2005, the Center for Forestry received a grant by EAR which made available part of the necessary laboratory equipment to successfully carry out control of seeds and seedlings, prognosis jobs, as well as molecular dynamics, causes and consequences of dry forests in the ECE methodology established bio indications points.

- ***Municipality***

Municipalities play a major role in the relationship between government and businesses in the forestry sector. They keep data related to forests and forestry at the local level. Municipalities periodically subsidize companies and individuals involved in forestry. However, last year the Municipality of Mojkovac has not subsidized any individual firm due to the economic recession. Nevertheless, it allocated €1,300 to the project FORSA Montenegro in 2010, which is directly related to forest issues.

- ***Financial institutions***

Financial institutions of relevance include banks, micro-finance institutions, European Development Fund, etc. Financial institutions help financially the projects of citizens and companies. Loans granted to companies in the timber industry in 2010 decreased by 2.1% compared to the previous year. This trend is alarming, given the fact that lack of funding represents the first barrier for the further development of this industry.

3.1 PRODUCTION PROCESS

As tree logs can be turned into a fairly wide range of products, there are many "value-adding" steps involved in the production process.

The process of **cutting timber** coming from the forest is composed of several steps: When the logs arrive in the mills, they are being separated by species/type, then graded and scaled. If the logs are not needed immediately, they are stored on a “log yard”, or on wet decks to prevent or at least slow down staining. Otherwise, the logs go to the debarker, which removes the outer bark, then to the headrig, where the sawyer (or wood technician) in charge inspects the logs and determines the best passes. The log is then sawed on four sides and turned to find the best place to start with.

The sawyer constantly evaluates the log for grade as the headrig saws deeper into the wood, and changes the dies (applications) with a view to obtaining the best possible cut. In Montenegro this is one of the traditional jobs and there are sawyers who are partially trained.

There a number of different kinds of raw wood products produced in this way: "**Round wood**" refers to raw wood products such as saw logs, veneer and pulpwood, which are also the most common ones in the Montenegrin market.

Saw logs

Saw logs are logs of different wood species that are cut into various lengths and in most of the cases end up as lumber. In order to be able to turn a tree into saw logs, certain sections of the trunk have to meet certain specifications, such as for instance log diameter, length, degree of rot, the number and kind of surface defects, or log curvature, amongst others. In the past, most loggers simply used to cut saw logs into eight-foot length. Nowadays, log length can vary considerably and making the cut in the right place can make a difference of hundreds of euros for the producer. Saw logs are usually measured in units called "board feet"[5] or "cubic feet"[6]. The metric measurement is "cubic meters".

Pulpwood

Trunks of a smaller diameter and lower quality wood are generally sorted in pulpwood piles. Pulp sticks are often further sorted by species, depending upon the preference of the mill the logger has a contract with. Most pulpwood ends up at a pulp mill where it gets processed into pulp (several companies in Municipality of Mojkovac are engaged in this process). Bales of wood pulp are a commodity, which is traded internationally. The pulp eventually gets turned into paper or a paper product (as there is there no paper factory in Montenegro, the pulp is mainly exported to neighboring countries such as Serbia or Bosnia). Pulpwood is measured in cords or tons. One cord is made up of about 79 cubic feet of solid wood within a 144 cubic foot space. Tons are usually measured by a truck scale located at the entrance of the mill. Trucks are weighed when they arrive and again before leaving. Prices based on weight typically vary depending on the seasons to account for the changing water content of the trees. Having a market for low quality and small diameter wood is very beneficial to forest management. However, this is difficult to implement from an economical point of view as there is hardly any market for this type of raw wood product in the country. Export markets in neighboring countries are not saturated yet though, which is why most of the pulpwood produced in Montenegro is being exported to Serbia, Kosovo, and the Former Yugoslav Republic of Macedonia.

Veneer Logs

Saw logs that are of exceptionally high quality are called veneer logs. Veneers are made up of thin layers of wood peeled from the logs and extend the use of increasingly uncommon high visual quality wood by being glued over lower quality wood. Veneer is used in final products such as paneling and furniture. Specifications for veneer logs vary from one company to another. A reject for one operation may be prime material for another - it all depends upon what a particular company intends to make from the veneer, or to whom the veneer mills sell their products to.

Whole Tree Logs

In some parts of Northern Montenegro entire trunks from the stump to a prescribed top diameter are delivered to mills. Usually the limbs are removed where the tree is felled and the long stems (boles) are dragged (skidded) out of the woods. This is not a very common harvesting method in the Municipality of Mojkovac, but rather occurs in other municipalities where it is common practice to haul wood. Such processed products, are further transported to end consumers.

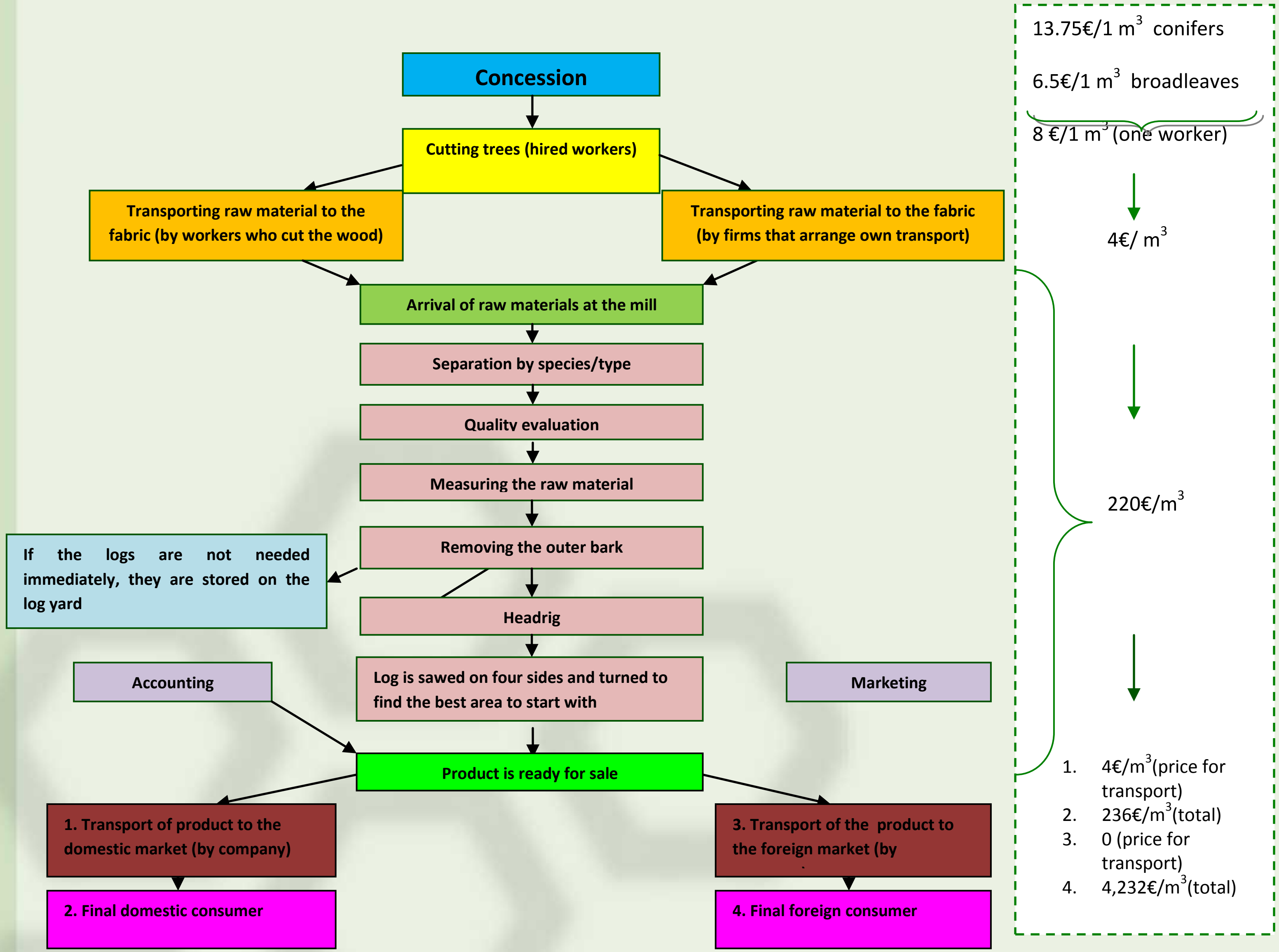
[5] Board Foot: A board foot is a piece of wood that is 12 inches wide, 12 inches long, and 1 inch thick. The number of board feet in a log takes into account the shape of a log and the amount of wood lost to saw dust when sawing.

[6] Cubic Foot: A cubic foot is a block of wood measuring the equivalent of 12 inches on all sides. A cubic foot will have less than 12 board feet because of the wood that is converted to sawdust when sawing.

3.2 PRODUCT SEASONALITY

Phase	J	F	M	A	M	J	J	A	S	O	N	D
Deforestation												
Processing												
Sale												

3.3 VALUE CHAIN



The value chain starts with **obtaining a concession** (€13.75 per 1m^3 for conifers and €6.5 per 1m^3 for broadleaves). The workers who cut wood in the forests operate at a cost of €8/m^3 per worker.
For the **transportation** of raw materials to the factory, there are two scenarios:

I) Workers who cut the wood transport the raw material to the factory themselves. The reimbursement for transportation amounts to approx. €4/m^3.
II) The company disposes of its own trucks that are used for transporting raw material to the factory.

Once the raw wood arrives at the factory the **processing** starts, which comprises of the following phases: separation by species/type, quality evaluation, measuring of raw material, removing the outer bark (if the logs are not needed immediately, they are stored on a log yard), headrig and finally sawing the log on four sides and turning it to find the best place to make the final cut.

To secure the **sale**, the managers (sometimes one or two employees) take care of any accounting and marketing issues. Sometimes they also pay other specialized firms to do that. This is, however, a rare practice because the companies are generally small and count only few employees who take care about multiple operations. The price of the product before it is being transported amounts to €232/m^3.

Depending on the target market and mode of transport chosen, the price of the **final product** can be calculated in two ways:

1. If the product has to be transported within Montenegro (domestic market) and the producer firm disposes of own transport vehicles, the price reaches €236/m^3 (€8/m^3+€4/m^3+€4/m^3+€220/ m^3=€236/m^3).
2. If the product has to be transported to customers abroad (foreign market), the clients usually take care of the transport themselves at no cost. The price of the product in this case hence amounts to €232/m^3 (€8/ m^3+€4/m^3+€220/ m^3=€232/m^3).

IV. SWOT ANALYSIS

Table: SWOT analysis of the cluster *"production of sawn timber"* in Mojkovac.

Strengths	Weaknesses
➢ **Proximity to raw materials** ➢ **Availability of medium and high skilled labor force** ➢ **Excellent wood quality**	➢ Low level of processing ➢ Obsolete technology ➢ Lack of funding ➢ Inadequate design capabilities ➢ Little diversity of products
Opportunities	**Threats**
➢ **Market proximity**	➢ No conducive concession system ➢ Poor road infrastructure for transport

- ***Strengths:*** The excellent quality of the wood is one of the most remarkable strengths of the local wood industry in Montenegro. The forests in the northern region are located outside the industrial areas, which implies that they are very organic. Another advantage marks the relatively easy access to raw wood material because the forest roads are not cumbersome to pass. As forestry can be regarded as one of the more 'traditional' industrial activities in Montenegro, there is also an abundance of skilled labor force. The workforce comprises all those individuals involved in wood processing from the first until the last stage. The experience of working in the forests has been passed on from generation to generation, and nowadays there are a large number of young and middle-aged people who work at this early stage of production. On the other hand, in every company there is at least one technical expert who has been well trained for tasks/jobs related to wood processing, and several young people who assist and learn by doing, or recent graduates who have completed a relevant school.

- ***Weaknesses***: The main weakness of wood industry in Mojkovac is reflected by the low level of processing (value addition). In most of the cases, cluster firms only produce semi-final products. Obsolete technology and lack of finance are also huge obstacles. Outdated technology is primarily applicable to the machines in production, which are largely bought second-hand (and have already been extensively used before) and are dilapidated. To be able to purchase new ones, funding would be required. At the same time, clients in the market are looking for new products and innovation. However, local firms are very static and also face difficulties when it comes to design, i.e. due to non-existence of the good design software and innovation capacities.

- ***Opportunities***: Neighboring countries have large demand for wood products from Mojkovac. Due to the geographical proximity transport is easier and cheaper and profits are good. Foreign markets have great capacities and they are could absorb more timber products from Montenegro if the capacities existed. Serbia, Bosnia and Herzegovina as well as Kosovo have products of a very good quality but they do not have steady distribution chains. Furthermore, those countries are very cautious when it comes to selling raw material, whilst in Montenegro there is no prescribed law that prevents companies from exporting such material. Semi-finished products like slabs, wall paneling and planks are selling very well. However, there are only few companies that are engaged in the manufacturing of log cabins, homes, etc. Increased exports of semi-final and final products are endeavored due to the higher profits that could be generated in this segment.

- ***Threats:*** The current concession system controlled by the state constitutes a threat to the wood industry all over Montenegro, not just in this specific cluster or the Durmitor region. Often times, concessions are given for an unfavorable period of the year, or they are purchased by some bigger companies. The consequences of this policy are manifold: The price that small producers have to pay for the raw material is high, while profits are very low. Furthermore, more and more companies have started to cut timber from the forests illegally. Road infrastructure (not forest roards) is certainly another major issue because it would require large amounts of investments. The highway Bar-Boljari, which is scheduled for construction, is expected to solve and improve the transport situation and could actually turn the road infrastructure into an advantage.

V. VISION OF THE CLUSTER

The cluster has enormous potential for further development. In this sense, it is very important to predict, or so to say “design”, future steps in terms of modification at the level of this individual cluster, as well as at the wood industry as a whole. The Municipality of Mojkovac has a strong local government, with a high interest in economic development.

The primary aim of all actors involved in the production process is to increase turnover, which could be best achieved by pooling individual small concessionaires and by introducing joint/collective applications for concession tenders to facilitate access to the raw material. It is estimated that such measures could lead to an increase in turnover of up to 15%.

Increasing the level of processing / value added of the products is a prerequisite for selling more products on the market at a good price. In addition, this cluster is more likely to develop and improve, if the individual producers started to jointly work on the branding and marketing of their products. It is essential that producers are able to offer a wider range of different products to clients, but at the same time ensure that they are “recognizable”. One way to achieve this could be in the form of products that indicate the origin from this area.

Furthermore, the better utilization of the capacities and resources that already exist in the northern region of Montenegro would provide greater autonomy to the producers in this cluster, and reduce the need for imports. Those capacities are primarily dependent on human capital. On the other hand, parts of the forests, for which concessions are available, remain unused due to wrong estimates and forecasting practices.

VI. CLUSTER DEVELOPMENT STRATEGY

In order to help the cluster develop further, the following issues need to be tacked:

- **Market analysis**: The assessment carried out so far has shown that this cluster is already placing its products on local, regional, national and international markets. A more in-depths market analysis would be required to identify the degree of market saturation and indicate potential for expansion in existing markets (such analysis would be relevant for all clusters working in this sector). This goes hand in hand with enhanced marketing efforts required from the cluster.

- **Productivity enhancement**: Increasing the productivity of workers through different factory layout/arrangement of machines and work stations, changes in operating procedures; enhanced safety measures to prevent accidents and interruptions of the work flow; better maintenance of equipment/ machinery/ tools to avoid breakdowns and rejections, etc. is also crucial.

- **Capacity increase**: Increasing capacity of cluster firms by building new facilities and buying new equipment is another requirement for further development of the cluster. The problem occurs, first of all, in terms of lack of the space inside the factories. The plants are built mostly on family farms so there would be capacities for expansion, but it cannot be realized due to a lack of funding. On the other hand, even more, because of obsolete equipment these plants cannot process a sufficient amount of logs in a given time frame (problem of scale and delivery).

- **Institutional linkages**: Manufacturers have good cooperation with local authorities. However, better linkages with institutions at the national level as well as with finance institutions need to be established. Improved communication as well as information sharing practices within the network will provide for a better and more conducive business environment.

VII. CONCLUSION

Based on this assessment it can be concluded that support for the development of this specific cluster would have primarily an impact on employment and thereby increase the living standard of people who work in the cluster companies. The processing period for this product is fairly long (throughout the whole year), so people could work there all times (in contrast to agriculture-based clusters). If the production capacity and marketability of the cluster can be increased through enhanced collaboration and collective action, there would be a high potential for new jobs to be created in the region.