

FOREST AND WOOD MANAGEMENT IN THE DRAVA VALLEY (SLOVENIA) IN CIVILIZATIONAL DEVELOPMENT STAGES

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Abstract

The extensive forests in the Drava valley make wood an important endogenous development potential in all civilizational development stages. In order to gain competitive advantage, create new job opportunities and achieve higher added value in the forest-wood chain in the Drava valley it is necessary to establish a balance between its co-dependent links. The current weak links (sawmills/primary wood processing, renewable sources and marketing) must become stronger to be equal to significant links of this chain (forestry, secondary wood processing and manufacturing finished goods). It requires establishing connections, networking and establishing commercial circles that operate locally, regionally and globally.

Keywords

Slovenia, the Drava valley, forestry, wood industry, civilizational development stages, forest-wood chain, commercial circles

Résumé

Vu les vastes forêts de la Vallée de la Drave (Slovénie), l'utilisation du bois a constitué un important potentiel de développement endogène à tous les stades de développements économiques. Dans le but d'améliorer la compétitivité de la région, de développer de nouveaux emplois et d'accroître la valeur ajoutée de la filière bois, il est recommandé d'établir un bilan des liens de dépendance entre les diverses activités de la filière. Les liens les plus faibles, notamment ceux entre les scieries et les entreprises de première transformation du bois ou entre la commercialisation et le recyclage, doivent être renforcés à l'exemple des relations qui existent déjà entre la sylviculture, les entreprises de deuxième transformation du bois et celles de fabrications d'objets et de meubles. Cela requiert de mettre en relations les différents acteurs et d'établir des cycles de commercialisation qui intègrent les échelles locale, régionale et globale.

Mots clés

Slovénie, Vallée de la Drave, foresterie, industrie du bois, filière bois, stades de développement, cycles de commercialisation

I. INTRODUCTION

The forest and wood have always been an important endogenous development potential of the Drava valley (Potočnik Slavič, 2010) because it is estimated that almost 80 % of its surface is covered by forests. The largest stands are found in the hilly parts of Pohorje and Kozjak, with lower quality forest patches in the flatter areas giving room to increasing agricultural and urban demands. The article aims to show the chronological and spatial development process of the forest and wood industry and their influence on the socioeconomic state of the Drava valley by using the concept of civilizational development stages (Klemenčič, 2003).

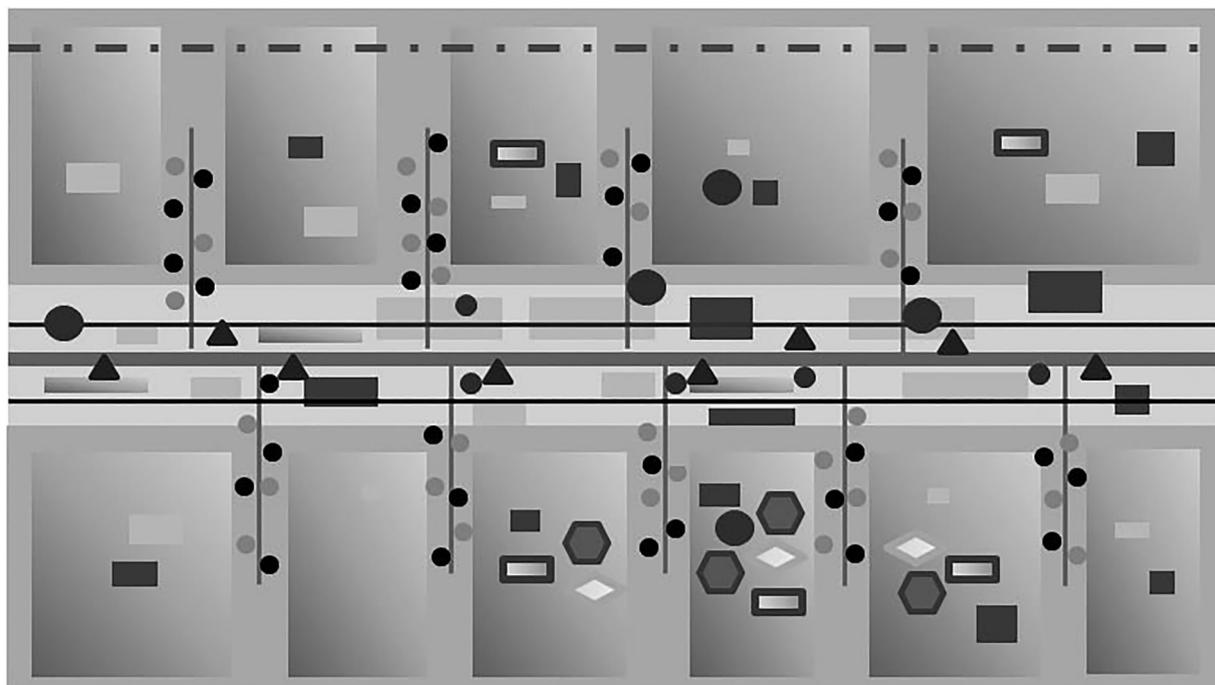
II. METHODOLOGY

By using civilizational development stages (Klemenčič, 2003), we presented complex spatial relations between the development factors and their timeline. Using statistical data (about unemployment) acquired at the Statistical Office of the Republic of Slovenia, rare literature and interviews with open-ended questions (conducted with the Director of the Gozdno gospodarstvo Slovenj Gradec, d.d., the employee of the family business and the holder of the supplementary activity at the farm) and field work, we created 4 models that show spatial and chronological state in forestry and wood industry in the Drava valley. The lack of

usable data made it impossible to carry out accurate qualitative analyses. That is why the method of commercial circles based on rough estimates derived from interviews was used to present the level of recognition, activity and use of endogenous potential (Potočnik Slavič, 2010). We also considered scenarios showing the potential development of the Drava valley in the area of forestry and wood industry from 2020 to 2050. The scenarios include the following development factors: forest and wood management, overgrowing of cultivated land, wood prices, product added value, level of employment and observing and marketing local potential (glocalisation.)

III. FOREST AND WOOD MANAGEMENT IN THE DRAVA VALLEY

The Drava valley is a border and peripheral rural region located in the South-East area of Slovenia and is comprised of eight municipalities (Dravograd, Muta, Vuzenica, Radlje ob Dravi, Podvelka, Ribnica na Pohorju, Selnica ob Dravi, and Ruše) that stretch across the area of 577 km². It is estimated that approximate 80 % of the Drava valley is covered by forests. The highest quality stands are found in the hilly parts of Pohorje and Kozjak, there are also some patches of once vast flatland forests of lower quality (at the bottom of the valley). The



Legend

hills	fields	local centre
valley	meadows/pastures	settlement with less than 500 inhabitants
river	forest	state border
stream	charcoal pile	road
sawmill	glass workshop	railway
mill	ironworks	rafting port

Source: Blaznik *et al.*, 1970, Zgonik, 1977, Macuh, 2000.

Diagram 1. Agrarian period – ground use and economic activities in the Drava valley

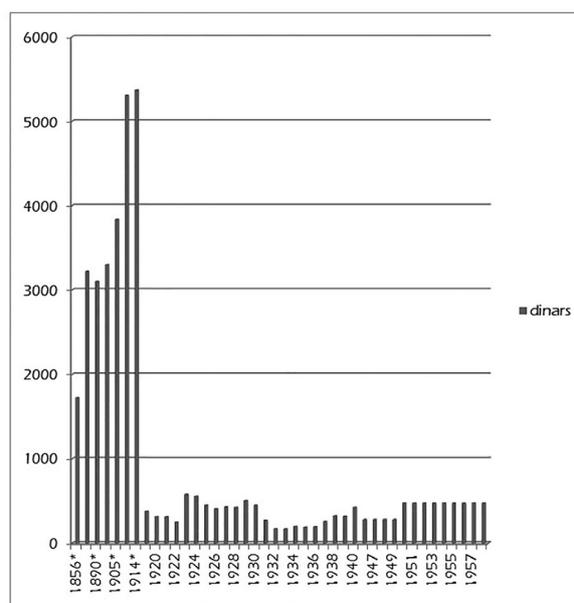
most common species of trees in the Drava valley are the beech, spruce, fir, chestnut, oak and pine. The expansive forests in this area make wood an important strategic local material and the driving force of a promising forest and wood industry. (Field work, 2010-2014).

The favourable natural geographical and socio-geographical conditions during the agrarian and industrial age caused forestry and wood industry in the Drava valley to bloom and to become the two major industries, together with timber rafting, ironworks, charcoal-burning, glass workshops, sawmills, logging and wood processing plants. The industrial development during the industrial period caused the start of deagrarianization and depopulation of mountainous areas and migration to the vicinity of industrial plants in the valley. The downfall of certain activities after World War II and the restructuring process in companies after Slovenia's independence in 1991 caused a significant decline in the forest and wood industry. The conditions are improving in the post-industrial period, but the development needs to be directed back to the traditional activities, and also considering the glocalization tendencies.

During the agrarian period when Pohorje was especially excessively logged to provide enough timber for rafting and the growing timber trade, only a few individuals tried to preserve it (forest engineers and owners), but today institutions take care of their sustainable development: the University of Ljubljana, the Pahernik Foundation, the Slovenia Forest Service and the timber company Gozdno gospodarstvo Slovenj Gradec d.d.

A. The booming development of forestry and wood trade in the agrarian period

The economic structure and the layout of the land in the agrarian period were very diverse and settlement was distinctly dispersed (Klemenčič, 2003). During this period, economic activities concentrated mainly in the hilly parts of Pohorje near the important local material deposits that supplied glass workshops, charcoal-burning, ironworks and timber rafting. Rich supply of wood from the Pohorje woods soon led to excessive logging. Between 150 and 200 m³ of logs were delivered on a daily basis to the Drava valley (Zgonik, 1977). In the 1920's and 1930's, anywhere between 1200 and 2000 rafts



Note:* - prices in florins calculated into dinars

Source: Sgerm, 1982.

Diagram 2. Price of 1m³ of sawn wood in individual years (in dinars)

yearly travelled downstream (Blaznik *et al.*, 1970). Wood was also transported on the Drava railway line built in 1863. Fast development of sawmills and wood processing plants along the Drava tributaries also took place at that time. The market value of wood was on the rise. This eventually caused the Drava valley to become one of the most active timber trade areas in Slovenia (Zgonik, 1977).

Intensive use of forests changed the intended use of certain areas of former woodlands (Diag. 1). During the 19th century, they discovered that since the Land Register of Francis I was put into force much of the forest was changed to pastures (or other agricultural surfaces) – as much as 10% in the Koroška region (Blaznik *et al.*, 1970). Many clearings were created (some of them were reforested mainly with spruce trees to cover the demand for timber in the 18th and 19th century), erosion and denudation were very common. Some areas (especially around Ribnica na Pohorju and Lovrenc na Pohorju) became marshes because the biological balance between the pastures and forests was destroyed, followed by heavy rainfall, which acidified silicate substrates on impermeable rock layers (Zgonik, 1977).

By the end of the 19th century, the massive decline in wood prices (Diag. 2) caused increased logging, which exceeded the natural growth, and it stopped in

some remote areas because of the high delivery costs. The price of timber continued to fall in the 20th century, and cheaper wood imported from Russia caused an additional decrease by the 1930's (Zgonik, 1977).

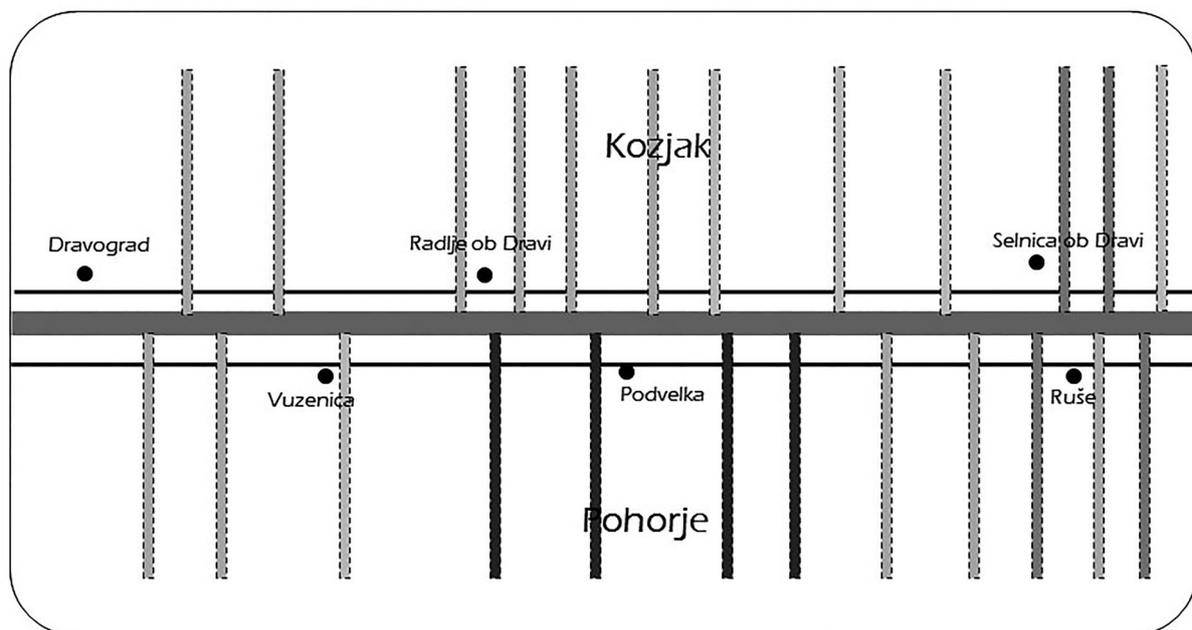
B. The industrial development stage in the Drava valley accelerates the development of the wood industry

The industrialisation process took place in the Drava valley after World War I. During the early industrialisation in the Drava valley (1918-1945), glass workshops, ironworks, charcoal-burning and timber rafting were still very important branches, and more sawmills were being built along the Drava tributaries. Most of the sawmills were initially built to supply self-sufficient farms. After timber rafting really expanded, some of the sawmills (especially near larger rafting ports in Vuzenica, Vuhred, Podvelka, Ožbalt, and also Selnica and Ruše) were

expanded and updated to supply the rafts with larger quantities of sawn wood (Diag. 3) (Jamnik *et al.*, 2007; Field work, 2010-2014).

Early attempts of industry (wood - sawmills, joiners' workshops; metal - blacksmiths, food - Frank factory) were already taking place during this period in the flatlands of the Drava valley. Smaller to medium sized companies were most common. Farmlands were mostly found in the lower parts of the valley, some also in the higher, hillier parts (near solitary farms). The general population mostly made a living with self-sufficient farming (Field work, 2010-2014). Also, the first two hydroelectric power plants (Fala and Dravograd) were constructed on the river Drava.

The industrial development stage tends to move towards the regional structure of a dotted corridor and thus destroy the landscape structure of the previous

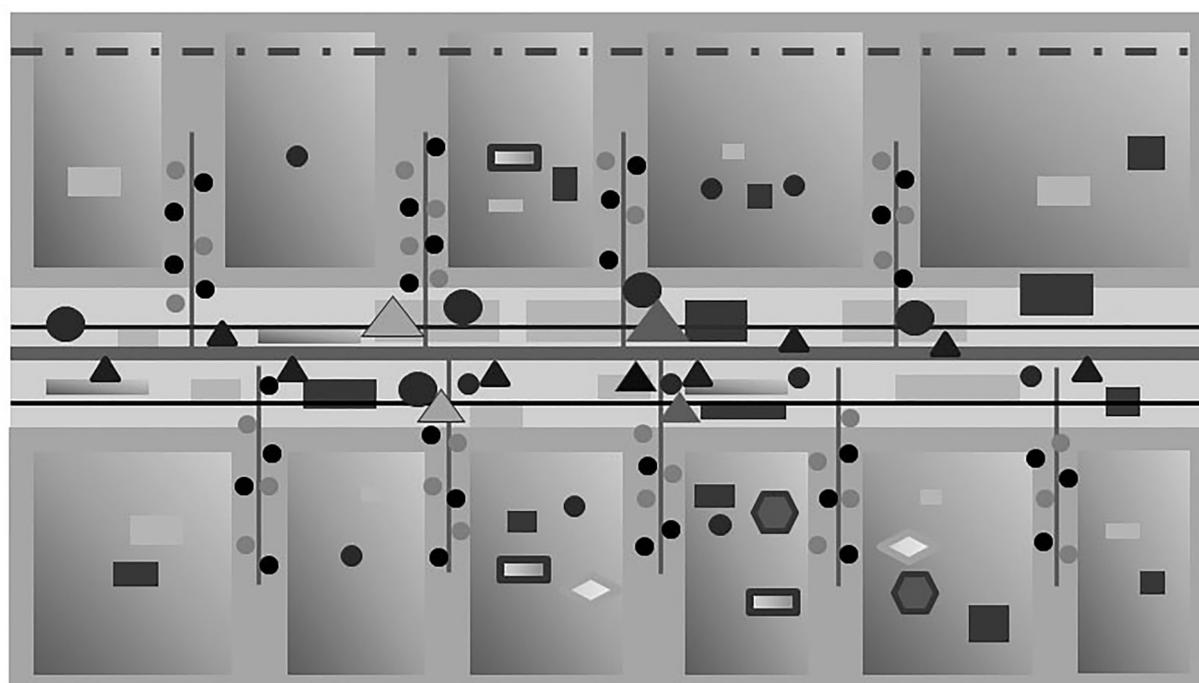


Legend

— road	the Drava river	1-7 sawmills
— railway	Drava tributary	8-14 sawmills
● large settlement		15-21 sawmills
		22-28 sawmills

Source: Adapted from Zgonik, 1977.

Diagram 3. Distribution of sawmills along the Drava tributaries in 1930



Legend

- | | | |
|---------------|---------------------------|---|
| hills | fields | local centre |
| valley | meadows/pastures | settlement with less than 500 inhabitants |
| river | forest | state border |
| stream | charcoal pile | road |
| sawmill | glass workshop | railway |
| mill | ironworks | rafting port |
| food industry | hydroelectric power plant | up to 50 employees |
| wood industry | metal industry | 50-100 employees |
| | | more than 100 employees |

Source: Blaznik *et al.*, 1970, Zgonik, 1977, Macuh, 2000; Field work 2010-2014.

Diagram 4. Industrial period – ground use and economic activities in the Drava valley during the early stages

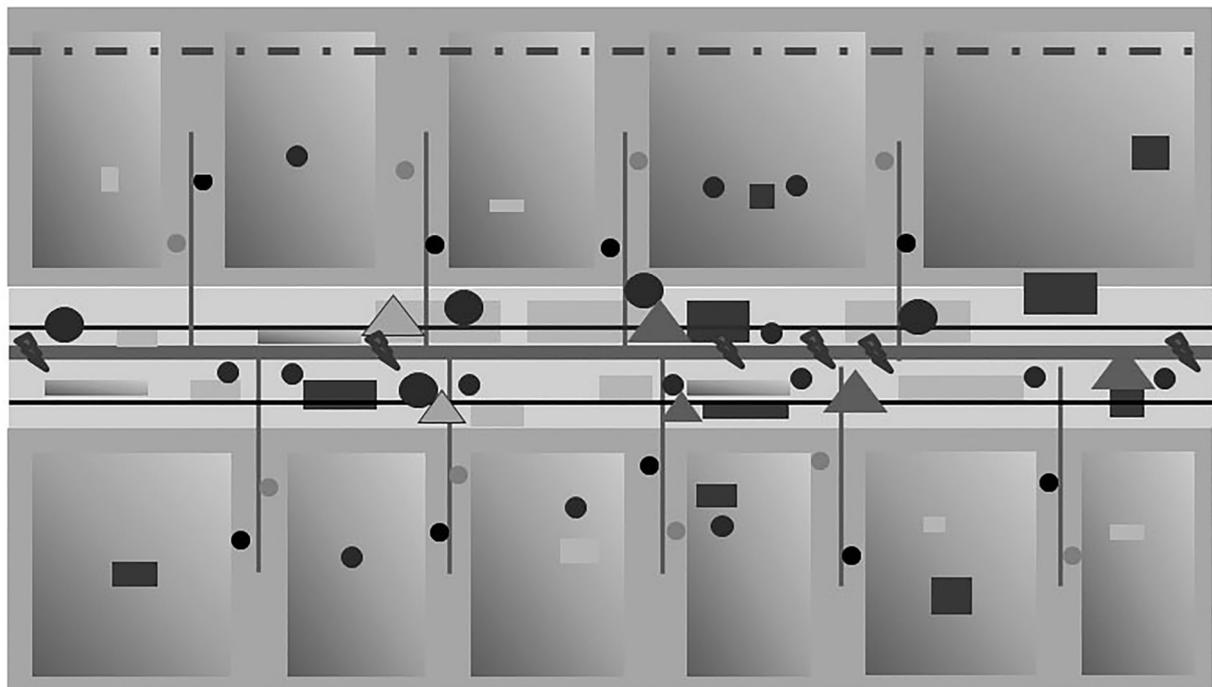
development stage (Klemenčič, 2003). The Drava valley was in the process of intense industrialisation between 1945 and 1990 (Diag. 4). After 1960, intense deagrarianization and depopulation of the hilly areas took place, which resulted in overgrowing of cultivated land due to migration and employment in the industrial branches in the valley (wood, metal, textile, food and construction industry). Limited job opportunities in the Drava valley forced the excess labour force to seek employment in the neighbouring municipalities (Ravne na Koroškem,

Slovenj Gradec, Maribor) or abroad (the majority also stayed there and return home when they retire). This is also a period of intensive logging, mainly to meet the demand of the local wood industry (Lesna (50-100 employees), Marles (50-100 employees)), mostly concentrated on the markets of former Yugoslavia (Croatia, Bosnia, Macedonia, Serbia, Montenegro). The main providers of forestry services are Gozdno gospodarstvo Slovenj Gradec and Gozdno gospodarstvo Maribor. It is estimated, that during the time of the biggest wood industry boom in the

Drava valley from 1970 to 1985, both companies collectively cut down approx. 400,000-600,000m³ of wood annually. During the same period, new wood processing plants (Lesna, Konstruktor, Marles, Žaga Vuhred) were established in Limbuš, Radlje ob Dravi, Vuhred and Podvelka, which created jobs for 500 people from the local environment (Field work, 2010-2014).

Building a chain of hydroelectric power plants on the Drava during the industrial development stage made it impossible to travel downstream on rafts or chaika boats (larger and more expensive vessels, similar to rafts, used to transport timber, fruit,

products from glass workshops and ironworks), which caused the downfall of rafting, the main economic activity beside the wood industry. After timber rafting, cargo was partly transported using the railroad and largely the newly built road. Metal and wood industry bloomed in the valley, many industrial plants were built, which created new jobs (the foundry Livarna in Vuzenica, Lesna in Radlje, Marles in Podvelka and Limbuš) and people moved from hilly areas to the valley and the lowlands. Economic activities in the hilly areas (glass workshops, ironworks, charcoal burning, milling industry, sawmills and farming) were abandoned and cultivated land was overgrown (Diag. 5).



Legend

hills	fields	local centre
valley	meadows/pastures	settlement with less than 500 inhabitants
river	forest	state border
stream	Hydroelectric power plant	road
sawmill	metal industry	railway
mill	wood industry	up to 50 employees
		50-100 employees

Source: Blaznik *et al.*, 1970, Zgonik, 1977, Macuh, 2000; Field work 2010-2014.

Diagram 5. Industrial period – ground use and economic activities in the Drava valley during the later stages

C. Post-industrial development stage and changes in connections between the links of the forest-wood chain

After 1990, at the beginning of the post-industrial or information era, all the links in the forest-wood chain of the Drava valley still function and are in balance. The industrial tradition also continued during this period, and so the development of the economy was still dictated by powerful forestry and wood processing companies with up to 100 employees that based their production on local materials. They were the leading companies in the Yugoslav market and also performed relatively well in other markets. They won recognition with the brands Lesna, Mares etc. In the early 1990’s, the collapse of the regulated Yugoslav market, lower quantities of cut wood, drop in purchase power, denationalisation process and failure to adapt to market demand caused the downfall of then powerful forest-wood industry, and consequently led to a significant increase in the number of unemployed people. The level of unemployment in the Drava valley municipalities in the second decade of this development stage was between 11-13.3 %, higher than the Slovene average of 10.7 %; SURS, 2014.

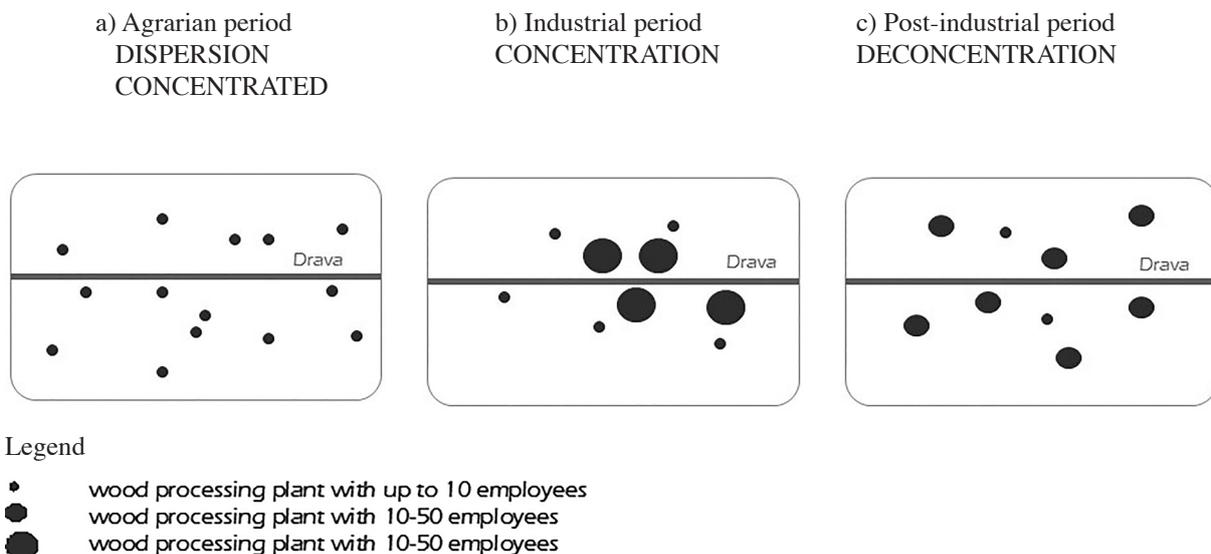
“Modernisation, implementing modern machinery and wood processing, and the crisis in the wood industry have caused the decrease in the number of employees from 800 to 115, which are mostly from

municipalities in Koroška.” (Interview 1: the director of the Gozdno gospodarstvo Slovenj Gradec company, 14.1.2011)

After Slovenia gained independence, less powerful wood processing companies went out of business (e.g. Lesna). Larger and more powerful forestry or wood processing companies formed in the industrialisation period in the flatlands (e.g. Marles, Gozdno gopsodarstvo Slovenj Gradec) managed to overcome this crisis, and several new companies with a smaller production line and fewer employees were formed (e.g. Gašper, Mizarstvo Jurač). This is also a period when farms with supplementary activities start to appear alongside state owned and private companies. These are mostly located between flatlands and the steeper parts of the Drava valley (Diag. 7).

“Our family company was established in 1993 as an independent company and we restructured into a limited liability company in 2010. Family members are qualified to cover all aspects of running a company: development, organisation, purchase, customer relations and management.” (Interview 2: an employee in a family business, 14.1.2013)

Wood processing plants with up to 10 employees were the dominant type in the agrarian period and they were dispersed all over the Drava valley (Diag. 6). The industrial period and the industrialisation

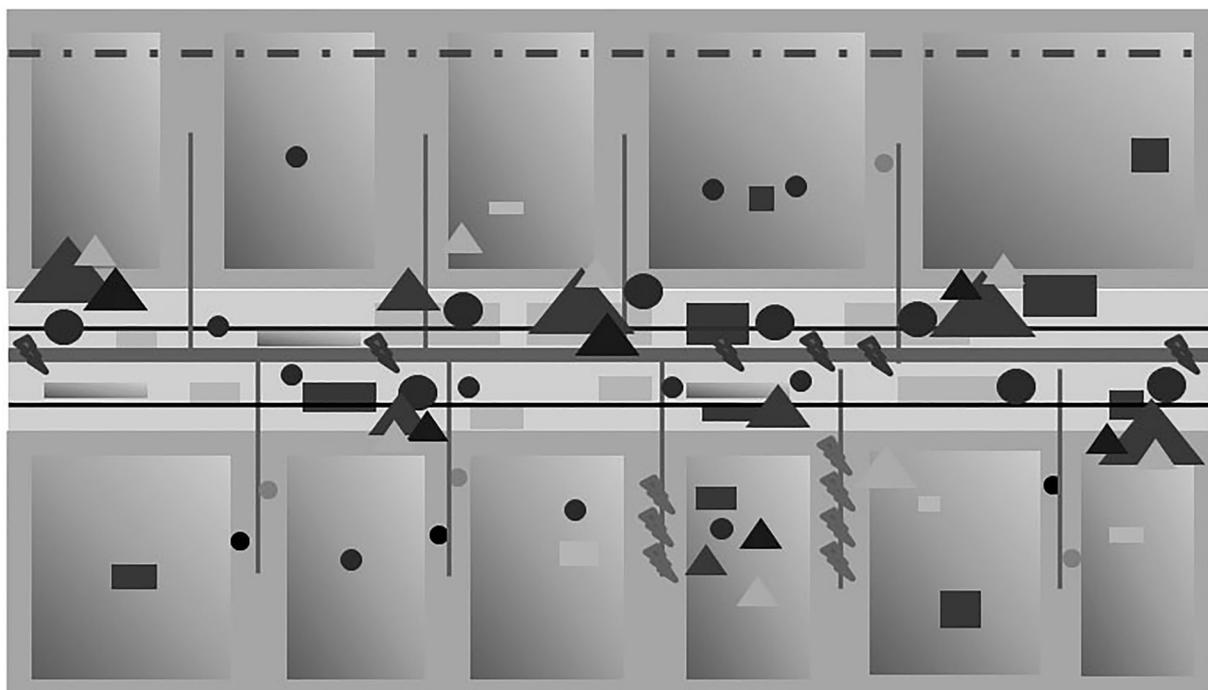


Source: Klemenčič, 2003, Field work, 2010-2014.

Diagram 6. Distribution of wood processing plants in the Drava valley in separate civilizational stages

process caused concentration of large companies with 50-100 employees in the flat areas along the Drava. Typical of post-industrial period is the concentrated deconcentration. Newly formed companies are mostly small to medium sized and more equally distributed along the Drava valley. The vast majority are independent companies (more than 100), the number of publicly owned companies or supplementary activities is nearly three times smaller (Diag. 8). By far the most common business activity is wood processing, followed by forestry companies and a few companies dealing with biomass, sawmills and wood trading.

There is strong local or regional cooperation, connecting and networking between the companies in the Drava valley, some of them even operate on a global level. They form regional commercial circles that strengthen inner relations, reduce dependence on the outside environment, economic relations and units, and also make their way on the foreign market (Potočnik Slavič, 2010). An increasing number of companies in the Drava valley are cooperating commercially, with manufactured products of one company serving other companies as raw material, which is then processed and sold with a higher added value.

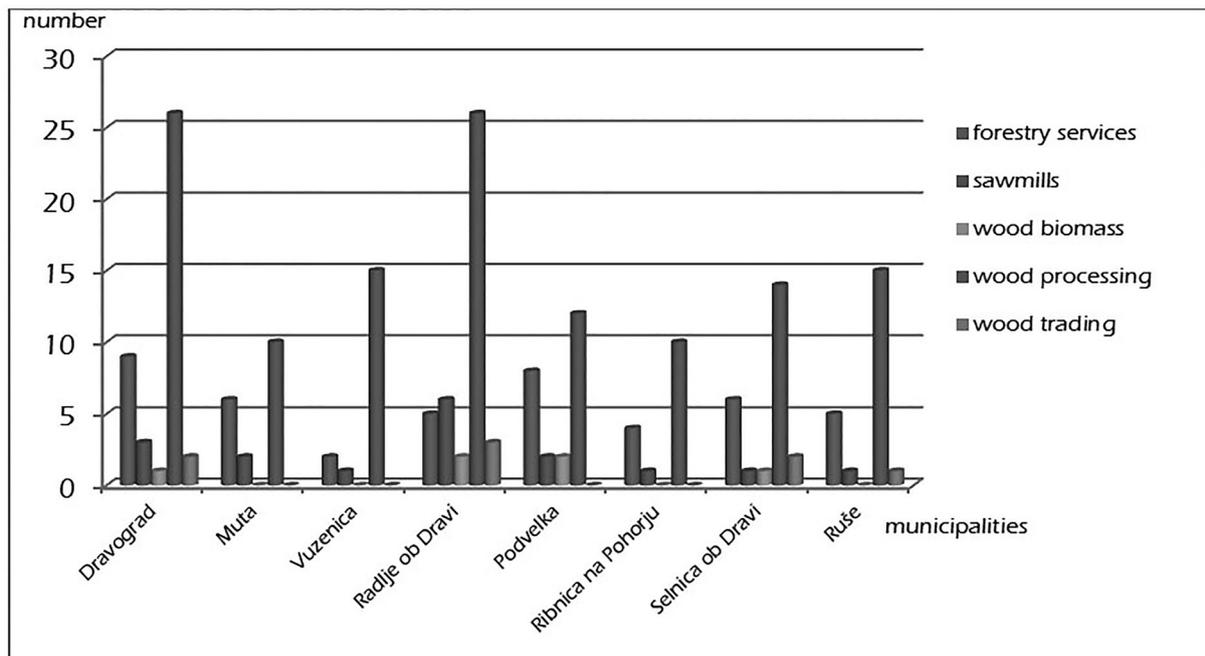


Legend

hills	fields	local centre
valley	meadows/pastures	settlement with less than 500 inhabitants
river	forest	state border
stream	hydroelectric power plant	road
sawmill	small hydroelectric plant	railway
mill	publicly owned company	1-5 companies
metal industry	independent company	6-15 companies
wood industry	supplementary activity	16-30 companies

Source: Adapted from the Ministry of Agriculture and the Environment, 2014, Field work, 2010-2014.

Diagram 7. Post-industrial period – ground use and economic activities in the Drava valley



Source: Bizi.si, 2011.

Diagram 8. Types of companies and institutions in the municipalities of the Drava valley connected in the forest-wood chain

“Our company cooperates with nearby and Austrian forestry companies. We also cooperate with other corporations, firms and suppliers from other parts of Slovenia.” (Interview 2; employee in a family business, 14.1.2013)

There are not enough sawmills in the Drava valley to keep up with the demand for sufficient quantities of wood, which is mainly needed in the local wood processing plants. Due to insufficient investments in modernisation, many sawmills either go out of business or are unable to control larger quantities of high-quality sawn wood. It is estimated that only a quarter of felled trees from the area is processed at the sawmills in the Drava valley. Other three quarters are exported to neighbouring Austria and get imported back into the country as wood material or wooden products with a higher added value and at a much higher price. That is why Austrian companies, which developed their capacity with the aid of national or European funds for rural and regional development, present a serious competitive threat to Slovene forestry and wood processing companies.

“This company is well aware of the importance of the forest and wood for the development of the Drava valley. We’re very concerned that there aren’t enough sawmills that would supply us and other

companies with suitable material and veneer for further processing. The materials used come from our local forests in Pohorje and Kozjak. It’s mostly wood of conifers. Hardwood is bought as logs from forestry plants or sawmills in the Drava valley, we often even exchange it for our own wood. We need to buy approx. 3% of wood in Austria. It’s mostly tree types that have a better quality abroad or veneers with thicker than 0.6 mm, which are not produced in Slovenia or don’t have a high enough quality.” (Interview 2; employee in a family business, 14.1.2013)

“Gozdno gospodarstvo Slovenj Gradec offers a wide array of high-quality domestic wood, which unfortunately doesn’t reach suitable prices in our market. That’s why we are becoming increasingly aware of the importance of processing local raw material.” (Interview 1; the director of the Gozdno gospodarstvo Slovenj Gradec company, 14.1.2011)

Sustainable use of wood in the Drava valley is a strategic priority. High potential wood processing companies (especially tradesmen) in the Drava valley are well aware of this as they follow the example of successful companies abroad. In order to survive

in the market and to keep a competitive edge, they utilized the advantage of local raw materials and appropriated financial aid from the European funds to purchase modern machinery to modernise their production and to implement modern wood processing methods. Employees from the local area are additionally educated and specialized. They also pass on their theoretical and practical knowhow to younger generations, who are still in the process of learning for the once again sought-after profession of a carpenter. In order to expand their market, they also sensibly use their strategic position – the nearby Austrian border. Their products are distinguished by high quality and a low carbon footprint, because they are made from local materials, the waste wood is processed into biomass, which is reused in their own production process.

“We manufacture products for specific people, individual customers. Our basic start-up production programme of front and interior doors is now complemented by our furniture programme and investments in development, which is performed in our modern workshop. We set up our own drying room, modern computer operated machines for wood processing, a paint shop, a furnace with a purification unit, offices and a wood biomass tender used for heating our own premises for production purposes.” (Interview 2; employee in a family business, 14.1.2013)

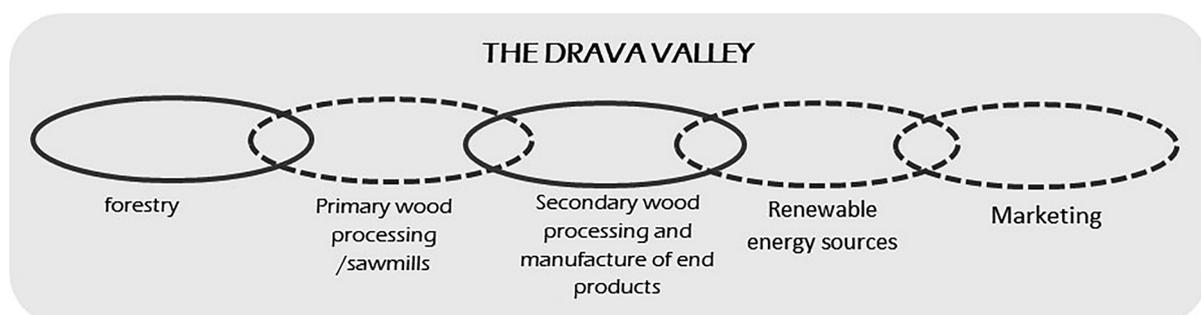
“We processed approximately 30 000 m³ of wood material from ice- and snow-damaged trees into cellulose and biomass in the last

five years.” (Interview 1; the director of the Gozdno gospodarstvo Slovenj Gradec company, 14.1.2011)

The most important factors of a successful business operation of companies are their financial and technical capabilities and following the rules of glocalisation. Commercial circles can assist in local i.e. regional connections, consequent self-reliance, providing job opportunities and economic growth, and that is why they must also be established in the Drava valley. We must improve connections and networking if local companies, which are no longer located in the flat areas of the valley, but distributed across the entire Drava valley.

More and more farms, which were involved in forest management and wood production in the industrial development stage, are now registering on-farm supplementary activities to market their products.

“We own a large forest area and this results in large quantities of wood and also wood waste, which we wanted to utilize as much as possible and to maximize its value. We needed to register an on-farm supplementary activity in 2009. Biomass is produced from branches, treetops, smaller trunks, low-grade wood unfit for further industrial processing, and shrubs. The thermal energy acquired from biomass is used to heat our home, the nearby primary school and fire station. We would like to expand our business in the future and to provide the thermal energy to other users.” (Interview 3; Holder of the on-farm supplementary activity, 29.8.2011)

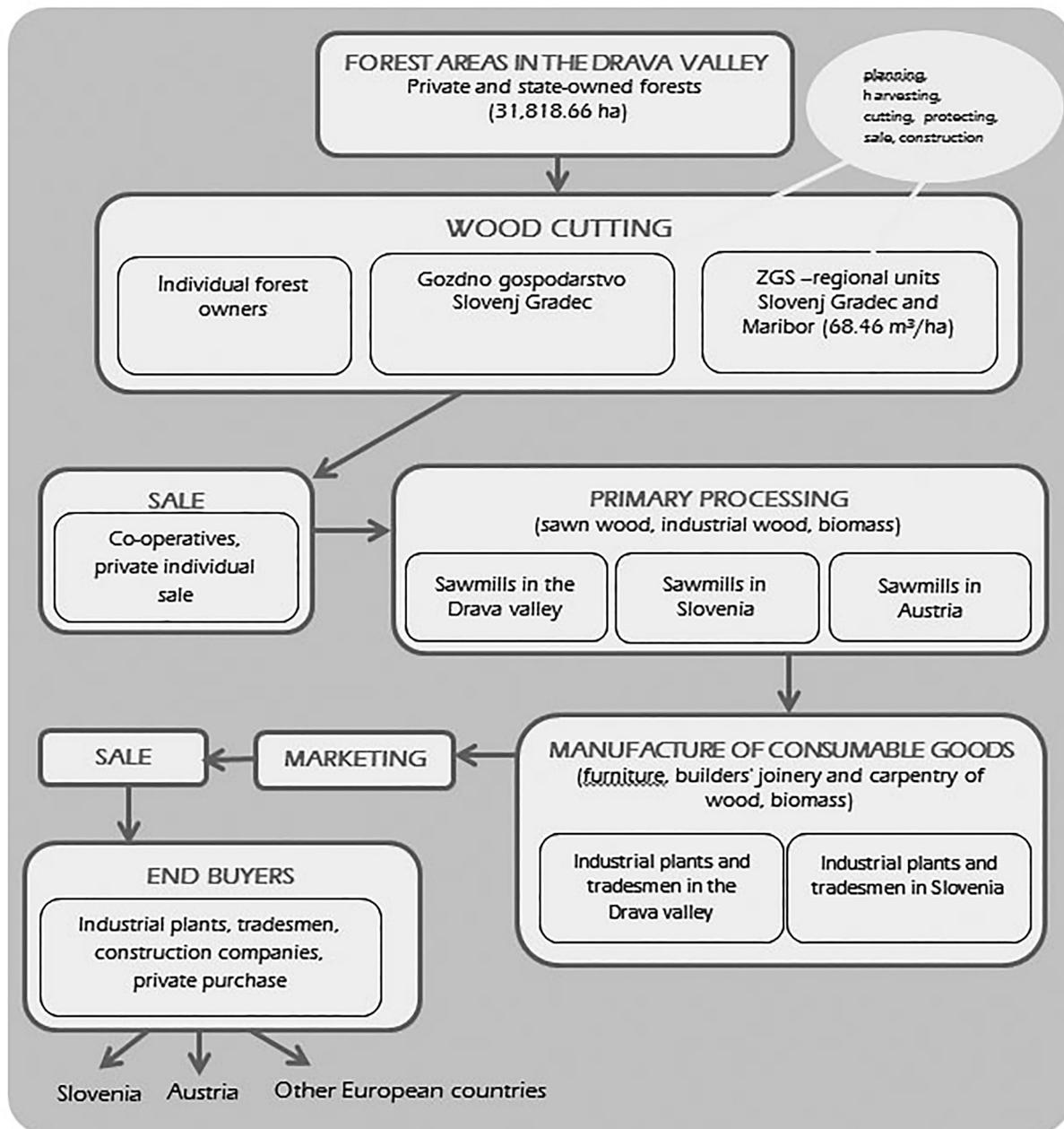


Legend



Source: Field work 2010-2014.

Diagram 9. Forest-wood chain in the Drava valley



Legend

- Agents in the production process
- Main production stages
- Main market directions

Source: Adapted from Potočnik Slavič, 2010 and Maier, 2002.

Diagram 10. Regional commercial circles in the Drava valley in the forest-wood chain

A suitably managed chain can increase the value of m³ of wood from the starting point in the forest to the wooden end product or building by a factor of as much as 100 or more if the wood is used for high-end technology products (“Les je lep” (“Wood is beautiful”), 2012).

Individual links of the forest-wood chain in the Drava valley complement and influence each oth-

er and seek interconnections. But there are also differences in their operation; all of them do not operate optimally (Diag. 9). The strongest links in the forest-wood chain in the Drava valley are forestry and secondary wood processing (Diag. 10).

“Our relatively new products, such as wooden structures and biomass that have been in the market for quite a while now, are

starting to gain a foothold in the market.” (Interview 1; the director of the Gozdno gospodarstvo Slovenj Gradec company, 14.1.2011)

IV. DEVELOPMENT SCENARIOS FOR THE DRAVA VALLEY 2020-2050

If we consider forest and wood management, inclusion of local population, investments and related local and regional development of the Drava valley in the past and present, we can only speculate on its future development in the field of forest-wood industry. We prepared four likely development scenarios for the Drava valley from 2020 to 2050. The scenarios include the following development factors: forest and wood management, overgrowing of cultivated land, wood prices, product added value, level of employment and observing and marketing local potential (glocalisation). The formation of the scenarios was driven by selected development factors, which were defined according to their relevance for the civilizational development stages. More pessimistic scenarios show a negative economic development. According to the next group of scenarios the future holds a continuing development of existing trends; whereas, the most optimistic scenarios portray a positive and sustainably-focused development of forestry and wood industry in the Drava Valley in the future including the sustainable use of endogenous resources pursuant to the anticipated desires and needs of the local communities.

In the last decades, the documents related to the rural development are mostly based on the paradigm of a sustainable development of the rural regions. Numerous development models are often accompanied by an endogenous development model, which places the responsibility for the development (preparation of development strategies, acquisition of funding, etc.) in the hands of the local communities that can in turn keep the generated income. Woods (2005) also points out some disadvantages of this development model (joint representation on the market is made difficult due to variegated interests of the local inhabitants, deepening the gap between local communities due to different opportunities for a successful endogenous development, assuming of the responsibility for making decisions about important development issues by

stronger social groups, the issue of jurisdictions and responsibilities is often not fully resolved, etc.)

The grounds for this model give rise to a more contemporary development approach, which is distinctive for economically developed countries of the 21st century. The model is based on the so-called non-endogenous approach (Ray, 2006). Non-endogenous development approach focuses on a balanced use of endogenous development potential and the strengthening of the local economy, and is mostly based on the premises and experiences of the European rural development policy, particularly the LEADER initiative.

The essence of the non-endogenous approach, as a highly territorial approach, is that the local region possesses or must acquire the chance to assume a part of the responsibility to improve the existing condition, and must also strive to develop structures that will help to establish the present and future development on a local level. The non-endogenous approach is also distinguished by two basic characteristics: the harmonization of development with needs, possibilities, expectations and values of the local inhabitants (Potočnik Slavič, 2010).

Scenario I. Outflow of sources from the region

This scenario is based on short-term interests. The unemployment level of 11-13.3 % in the municipalities of the Drava valley, which is typical of the post-industrial development stage, will be halved from 2020 to 2050 due to job opportunities in the newly formed companies owned by foreign investors. These companies will replace uncompetitive local wood processing companies. Implementing new activities, uncommon in the Drava valley, will require new materials and suitably qualified and educated workforce, which is not yet available in this region, and this would mean that the development of such companies and the socioeconomic status of employees are questionable.

Experts estimate that 20-30 % of cultivated land in the Drava valley was overgrown in the last 40 years due to dispersed land structure, abandoned farm areas, no interest in pruning trees and maintaining a healthy forest. If the same reasons persist, the overgrowing of cultivated land will continue with the same rate in the future.

As much as 80 % of logs harvested in the Drava valley in the post-industrial development stage are sold directly, without any additional processing that would add value to the wood. Neighbouring Austria will continue to take advantage of the low wood prices (1 m³ of spruce and fir timber costs 60-70 EUR) caused by low purchasing power in the region, and buy raw material cheaply. Overexploiting high-quality wood from Pohorje and Kozjak will cause shortage thereof and, consequently, increased prices (50-100%). This will make local wood even more inaccessible to local customers.

Scenario II. Decline of socioeconomic status

After 2020, most existing economic activities in the Drava valley will declare bankruptcy caused by lack of investments in educating the workforce, modernisation of technological equipment and uncompetitive products. Any future investments in further development of existing activities that could offer employment to currently unemployed workforce (wood processing industry, metal industry) would be too high, and this means it would be pointless to expect any help from foreign investors. After the period of 2014-2020, the possibility of acquiring EU financial aid will no longer be available. The current above average unemployment rate in the Drava valley will keep rising until it reaches 50 % in 2050.

Foreign buyers will continue to buy large quantities of round timber without any added value (60-70 EUR per m³) after the financial ruin of wood processing companies in the Drava valley, and this will cause overexploitation of this natural source. Abandoned farm areas will overgrow and after 2030 half of these areas will be covered by forests.

Lack of job opportunities, poor road and housing infrastructure, lack of educational and commercial centres and general lack of hope for better living conditions in the Drava valley will force people, especially the younger generations, to move to more developed areas in Slovenia or even abroad.

Scenario III. Networking of all involved parties

The key to successful development of the Drava valley from 2020 to 2050 is networking. This requires mutual connections and cooperation between companies and forming active commercial

circles that grow stronger and evolve from a local to regional, state and, finally, international dimension. Companies involved in networking produce competitive products, employ local population and contribute to improving their socioeconomic status.

Observing glocalisation, which puts emphasis on local responses to pressures of globalisation, will result in the development of known activities in the Drava valley (farming, forestry, wood processing, construction and metal industry, and rural tourism) by offering high-quality and competitive products under a recognizable brand name.

Wood industry will get a new boost and the economic network will be reformed on a local and regional level. The emphasis will be on sustainable management of forests and wood, prices will be lowered (below 60-70 €/m³). Allocated subsidies for farmers will help prevent overgrowing of farm areas, rural tourism will have less problems getting started, better marketing of typical wood-related local products with a unified recognisable brand name.

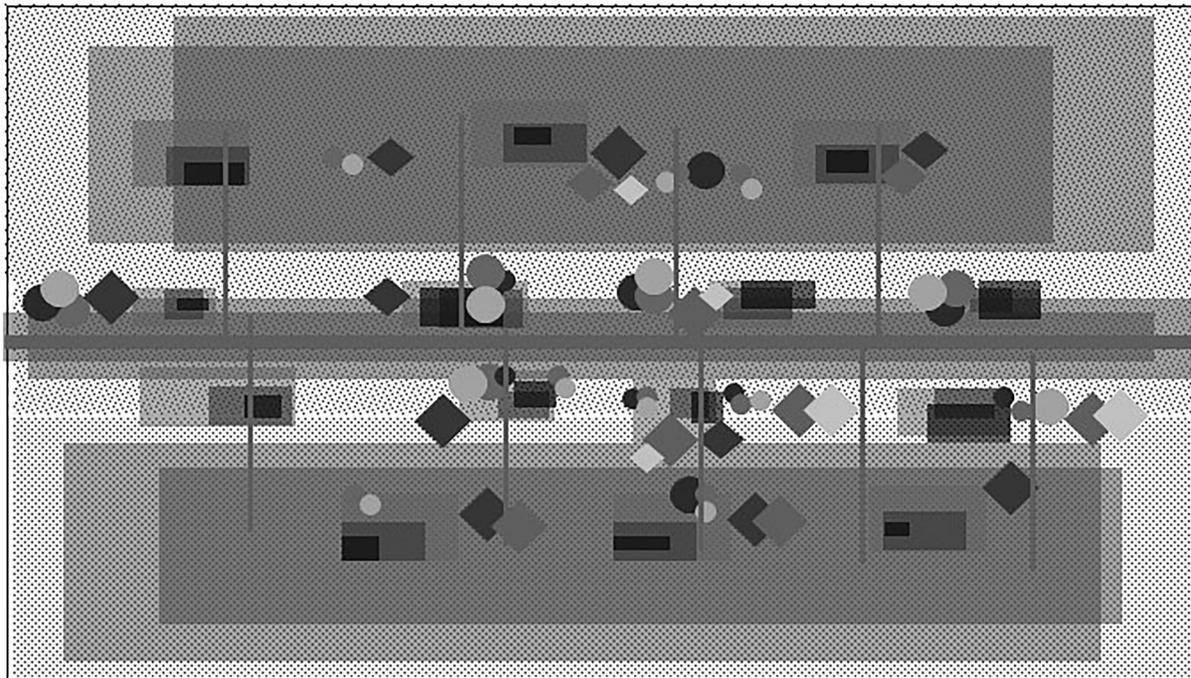
Scenario IV. Sustainable management – past traditions and future opportunities

After 2020, we will see an effort in the forests of the Drava valley to reforest affected areas, regular maintenance and removing excess biomass and achieving optimal tree cutting (currently only 80 % of optimal tree cutting is achieved) will limit overgrowing.

Suitably educated and qualified candidates will promote processing local wood and manufacture products with a high added value, which will be competitive in the market. Locally harvested wood will be one of the basic building elements in the construction of low-energy buildings.

Extensive agriculture in the Drava valley will put emphasis on organic farming and crops with a higher added value and marketing local products. Rural tourism will benefit from greater awareness and sustainable use of endogenous potential in the Drava valley, become more important and will be able to provide employment to more than 50 % of people in the area.

Promoting and marketing local products (laminated wood, width and length wise glued laminated



Legend

	forest area in the agricultural era		settlement with less than 500 inhabitants
	forest area in the industrial era		local centre
	forest area in the post-industrial era		inhabitants in the agricultural era
	agricultural land in the agricultural era		inhabitants in the industrial era
	agricultural land in the industrial era		inhabitants in the post-industrial era
	agricultural land in the post-industrial era		wood processing plant with up to 10 employees
	river		wood processing plant with 10-50 employees
	stream		wood processing plant with 10-50 employees
			wood processing plant in agrarian period
			wood processing plant in industrial period
			wood processing plant in post-industrial period

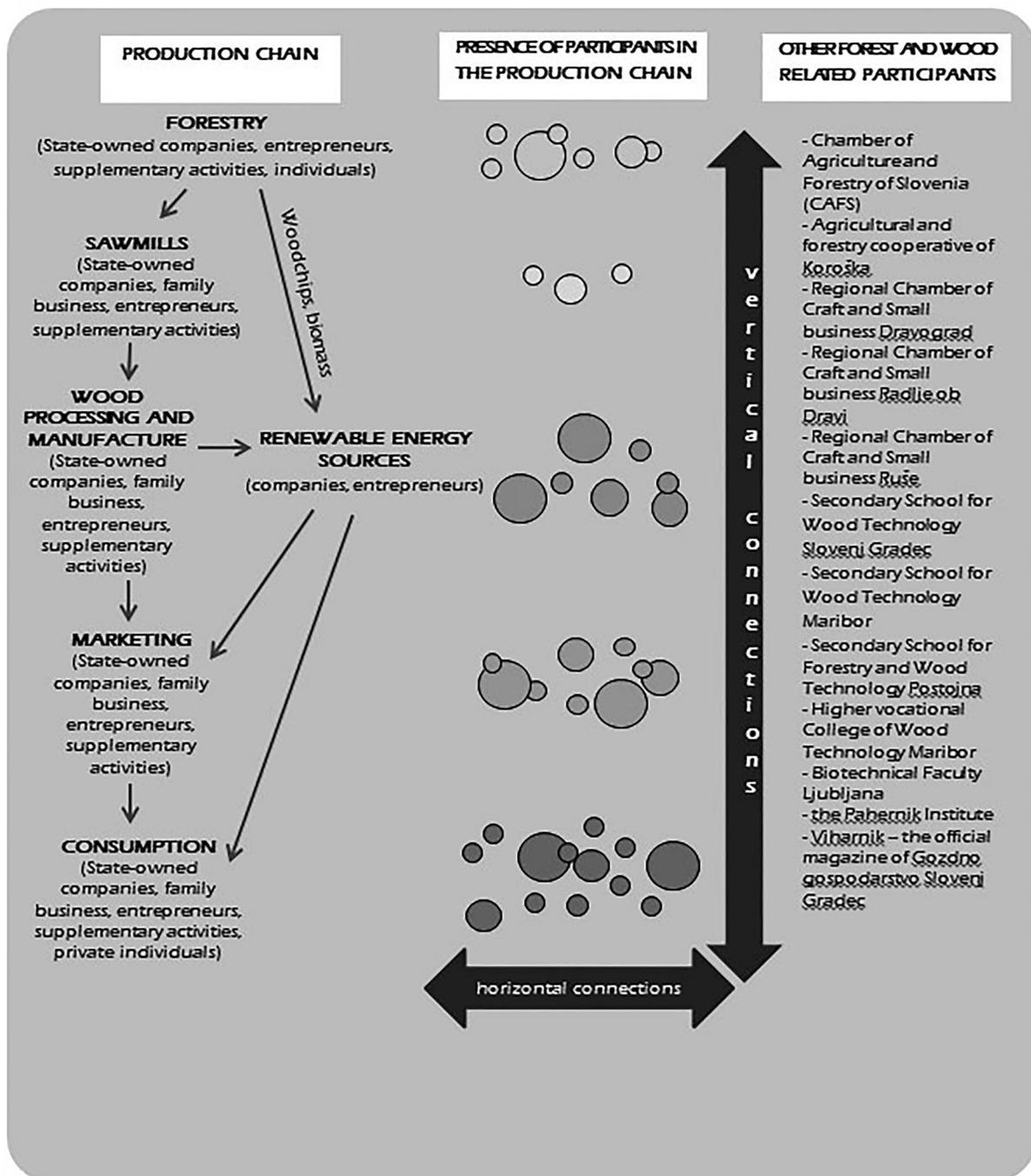
Source: Blaznik *et al.*, 1970; Zgonik, 1977; Macuh, 2000; Klemenčič, 2003; Field work, 2010-2014.

Diagram 11. Development of economic activities in the Drava Valley in different civilizational stages

construction timber, cross-laminated timber, timber for prefabricated houses and roofing, wood construction elements, furniture, builders' joinery and carpentry of wood, solid wood furniture, small goods made from wood, wooden toys, wood pellets, woodchips, biomass, cellulose, raw material for chipboards and laminated boards) under a single brand name will make the Drava valley more recognisable, a better quality of life will also encourage people to move to this region.

IV. CONCLUSION

Forests as a natural resource of the Drava valley cover around 80 % of the entire area and are an important source of renewable domestic raw material and the driving force of the economic development. This is why forests must be protected and nurtured according to the principles of sustainable development. At the end of the agrarian and in the industrial period (Diag. 11), forestry and wood



Legend

- Individual or a small company (up to 50 employees)
- Medium-sized company (50-100 employees)
- Large company (more than 100 employees)

Source: Adapted from Hofer and Stalder, 2000; Potočnik Slavič 2000, Field work 2010-2014.

Diagram 12. Vertical and horizontal connections between participants in the wood processing chain i.e. regional commercial circles of the Drava valley

processing were well developed. The wood trade was blooming, wood processing plants developed and they strived to mass-produce products with a lower added value. Only individuals (mostly tradesmen) preserved the knowledge of traditional wood processing, which gives the products a much higher added value.

The developmental obstacles that are slowing down the development of endogenous potential and diminishing the development opportunities of the Drava Valley are its peripheral character, the absence of collective spirit between the local inhabitants, poor flow of information and lack of institutional flexibility. The peripheral location together with poor accessibility hinders the flow of large quantities of goods and information and impedes the technological advances. Inability of the local inhabitants to join their forces further hinders the establishment of the rural network and business circles. The lack of institutional flexibility is shown in the form of poor communication between local establishments, administrative obstacles and low financial incentives for the economic and general advancement of the Drava Valley.

In the post-industrial period, the Drava valley has again presented the opportunity for a successful economic development based on following tradition, mutual connections and networking among individuals or smaller existing companies, and innovative approaches in the area of marketing own products.

In order to achieve economic progress in the Drava valley, it is necessary to have an integrated approach to establishing the optimal condition along the entire forest-wood chain (Diag. 12). It is necessary to reinforce its weak links and to establish a balance between all links that form it. It is vital to establish vertical and horizontal connections between individual participants in the forest-wood chain.

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