

Theories of Regional Development and Their Relevance to the Forest Sector

Markku Tykkyläinen, Pentti Hyttinen and Ari Mononen

Tykkyläinen, M., Hyttinen, P. & Mononen, A. 1997. Theories of regional development and their relevance to the forest sector. *Silva Fennica* 31(4): 447–459.

The paper elaborates upon various theories to explain economic development and restructuring in the forested regions of advanced countries. The concepts of communities based on the forest sector and the concept of restructuring are discussed before presenting the diversity of relevant theories. Different theoretical approaches in geography and regional and socio-economic sciences are analyzed, and the paper concludes that each theory gives only a partial explanation of restructuring under certain conditions. This paper recommends that an explanatory framework should take into account – in addition to general explanatory factors – sectoral, local-specific and policy-related factors and the role of human agency in attempts to explain restructuring and development.

Keywords regional development, restructuring, resource community, geography, forest policy, forest economics

Authors' addresses *Tykkyläinen*, University of Joensuu, Department of Geography, P.O. Box 111, FIN-80101 Joensuu, Finland; *Hyttinen* and *Mononen*, European Forest Institute, Torikatu 34, FIN-80100 Joensuu, Finland

Fax (Tykkyläinen) +358 13 251 3454 **E-mail** markku.tykkylainen@joensuu.fi

Received 8 January 1997 **Accepted** 10 November 1997

1 Introduction

The consumption of forest products, which are produced mainly in outlying rural areas, is continuously increasing regardless of the growing prevalence of the information or post-industrial society. Forest businesses have a perpetual role in the global economy, and communities based on the forest sector are central entities in the economies of many outlying regions. One mani-

festation of the recognition of the importance of the forest sector is that many regional councils are searching for forest-based solutions to development problems in the sparsely populated forest zone of Fenno-Scandia (Hyttinen et al. 1996). However, the development of communities based on the forest sector is a multi-faceted socio-economic process.

Economic restructuring (denoting economic transformation in accordance with a changing economic environment) in the forest sector and

its influence on the spatial organization of economic and social activities have been explained in numerous ways in geography, forest economics, regional sciences and in many disciplines of the social sciences. Varying explanations of the development of forested regions have been provided based on the different traditions in the academic disciplines. However, it seems that many theories do not provide any unambiguous explanations of development. Why do they sound so vague? Or do we expect too much?

The purpose of this paper is to examine, by means of a literature study, the coverage and applicability of regional theories and spatio-economic approaches used in the explanation of development and restructuring of communities based on the forest sector. Especially emphasized are communities located in regions where commercial forestry and advanced forest industries can play an important role in the economy of a region.

2 Concepts of Resource Communities and Restructuring

The forest sector possesses two kinds of spatial patterns in the Nordic Countries. Forestry is an areal mode of production often based on scattered settlement structures in countries where small farming and farmers' forest ownership are dominant. Other forest industries, such as saw mills, pulp mills and chip board factories, usually create an agglomerated regional structure in the form of villages and industrial towns. The term 'resource community' is a feasible concept for the analysis of community development also in the forest sector. This term is often associated with small localities in resource frontiers, i.e. remote settlements that gain their livelihood from mining, agriculture, etc. (Brealey et al. 1988).

A *forest industrial community* is a subcategory of the concept 'resource community' and is usually a compact town in a rural setting. From a standpoint of a forest industrial company, such communities increasingly consist of a network of social entities of the company split into several localities. A shared interest in the forest business maintains the social network in which they

are collaborating. The factors forming such a forest industrial community are a common economic basis which induce a social network. As an example, the settlement pattern in Finland, generated by resource-based industrial activities, has consisted mainly of a network of forest industrial communities, where saw mills, pulp mills, and other wood processing plants are located.

Forest resource communities may be considered from the standpoints of farmers, foresters or timber companies. In all, forestry has generated a more dispersed settlement pattern, earlier being closely linked with agriculture and providing for seasonal work. Nowadays, forestry is providing work for a few farmers and harvesting entrepreneurs (e.g. Rannikko 1996), sustaining the scattered patterns of settlement. Forest resource communities are incorporated into rural settlement structures, being an inconspicuous part of rural communities. Advanced technology makes possible the increase of labor productivity and, hence, the prevalence of the spatial reorganization of labor in forestry.

Economic and social structures and the physical shape of communities vary and are currently faced with *restructuring* due to the structural changes taking place in the forest sector. The concept of restructuring refers to structural changes in society (Friedmann 1991, Storper and Walker 1989, Neil and Tykkyläinen 1998). This restructuring process, caused by economic upheavals and individual and social responses to them, leads to new spatial forms and arrangements of communities (Fig. 1). Restructuring is especially associated with rapid qualitative changes in a community, such as the closures of factories or the emergence of new industries. In general, communities are transforming their structures and functions in the face of external pressures and local responses.

Communities are faced with different outcomes due to this restructuring. Local or regional development can be 'balanced' and *steady*, often meaning low unemployment and migration rates. Furthermore, the diversification of the local economic sector may occur. *Expansion* of the basic sectors may create an economic boom in the community, as often happens when an economic upswing prevails in the forest sector. Sometimes the community may be *scaled down*, for instance

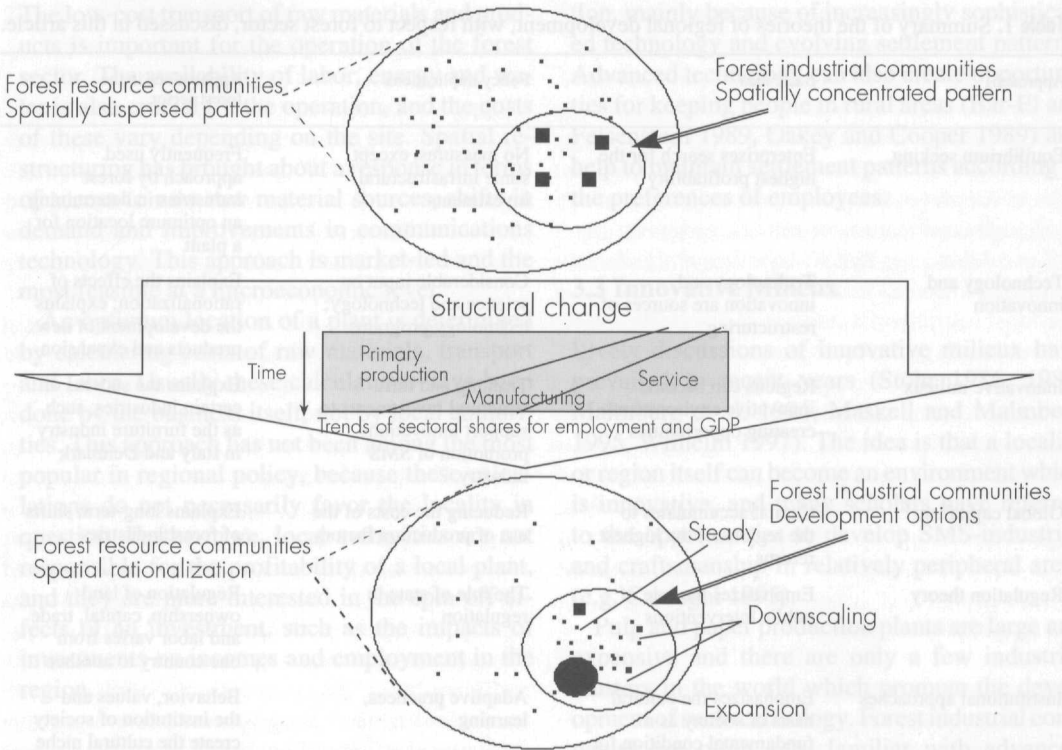


Fig. 1. Spatial impacts of structural change in both forest resource communities and forest industrial communities.

when a saw mill or a pulp mill is closed. Simultaneously, new investments may take place in the region and, hence, some communities flourish. Communities based on the forest sector are facing a bundle of development factors, and these developments have to be taken into account in making an evaluation of the theories (Fig. 1).

3 The Diversity of Theories

Explanations of restructuring in forest industrial communities (forestry has usually played a minor role in theories) are based on a heterogeneous set of regional development theories which describe certain parts of social and economic processes. Correspondingly, the argumentation is highly diversified. The variety of theories reflects the emphasis of scientific interests, the uniqueness of empirical cases, the different intel-

lectual environments and the evolution of theoretical ideas.

Development theories may be grouped into more or less coherent approaches or paradigms. The currently prevailing approaches, with respect to forest industrial communities (Table 1), are discussed below.

3.1 Equilibrium Seeking

In order to find an equilibrium in the market for production factors, these kinds of theories assume that investments take place where the returns are highest and labor will flow from low-wage to high-wage regions (Malecki 1991, p. 74–75). The paradigm draws attention to the main aim of an enterprise, which is profitability (Hurter and Martinich 1989).

This approach is frequently used in explaining the spatial reorganization of the forest sector.

Table 1. Summary of the theories of regional development, with respect to forest sector, discussed in this article.

Approach	Basic idea	Policy implications	Applications in the forest sector
Equilibrium seeking	Enterprises search for the highest profitability	No measures, except some infrastructural investments	Frequently used approach by forest industries in determining an optimum location for a plant
Technology and innovation	Technology and innovation are sources of restructuring	Considerable input on science and technology; technology programs	Explains the effects of rationalization; explains the development of new products and expansion
Innovative milieu	Regions can become innovative environments creating opportunities	Training and infrastructural investments to support innovations, promotion of SMS industry	Explains the success of certain industries, such as the furniture industry in Italy and Denmark
Global capitalism	Capital accumulates to the regions of the highest returns	Reducing the costs of the use of production factors	Explains long-term shifts of forest industries
Regulation theory	Emphasizes the role of public interventions	The role of state in regulation	Regulation of land ownership, capital, trade and labor varies from one country to another
Institutional approaches	Emphasizes the cultural basis of society as a fundamental condition for development	Adaptive practices, learning	Behavior, values and the institution of society create the cultural niche where the forest sector operates
Resources and the physical environment	The location and availability of natural resources play a major role in development of regions	Policies to remove physical constraints	Fundamental explanation for the historical development of the forest sector
Keynesian applications	Emphasizes the role of multiplier effects in aiming for development	Policies to create growth centers	Subsidized forest industry investments in peripheries to boost regional development
Product cycles	The optimal location for production unit changes during the life-time of the product	Policy adjustments according to the cycles	Large mills are rather immobile, SMEs are susceptible to product cycles
Supply-side policy	Investments in infrastructure should be encouraged to attract investors	Deregulation, investments in infrastructure, development projects, partnerships	Infrastructural factors, such as roads and waterways are considered as crucial factors
Human ecology and environmental management	Environmental factors have an increasing importance in locational decisions	Regulation, taxation (environmental tax)	Impacts on investments: recycling, closed production processes, etc.
Environmental concern	The industrial sector should take into account the opinions of various interest groups and environmental preferences	Measures for environmentally-friendly development	Explains environmentally-sensitive production decisions and similar acquisitions of raw materials

The low-cost transport of raw materials and products is important for the operation of the forest sector. The availability of labor, energy and water is also crucial for the operation, and the costs of these vary depending on the site. Spatial restructuring has brought about a response in terms of access to new raw material sources, shifts in demand and improvements in communications technology. This approach is market-led and the most feasible at a microeconomic level.

An optimum location of a plant is determined by calculating costs of raw materials, transport and labor. Usually these calculations have been done by the business itself, not by local authorities. This approach has not been among the most popular in regional policy, because these calculations do not necessarily favor the locality in question. Furthermore, local authorities are not responsible for the profitability of a local plant, and they are more interested in the spin-off effects of an investment, such as the impacts of investments on incomes and employment in the region.

3.2 Technology and Innovation

Innovations and progress in production technology are common inducers of restructuring, and the role of these factors have been discussed more widely in recent years (e.g. Malecki 1991, Davelaar 1991, Hall et al. 1987, Husso et al. 1997, Kangasharju and Nijkamp 1997). A flexible techno-economic paradigm and an urban environment conducive to development have been regarded as engines in the new wave of development (Freeman and Perez 1988, Brotchie et al. 1991). Innovations increase the productivity of labor, and such increases in productivity can often explain why resource communities need to downsize labor. Thus, innovations may have a negative impact on regional development in that sense, but they are necessary to keep business viable.

The discussion of post-industrial society has mostly dealt with changes in urban patterns, networks and high-tech industries and some services (Masuda 1980, Stöhr 1986, Andersson and Strömquist 1988, Hall 1985, Castells 1996), but the forest sector is also faced with transforma-

tion, mainly because of increasingly sophisticated technology and evolving settlement patterns. Advanced technology can also create opportunities for keeping people in rural areas (Bar-El and Felsenstein 1989, Oakey and Cooper 1989) and help to maintain settlement patterns according to the preferences of employees.

3.3 Innovative Milieux

Lively discussions of innovative milieux have prevailed in recent years (Stöhr 1986, 1987, Malmberg et al. 1996, Maskell and Malmberg 1995, Wilhelm 1997). The idea is that a locality or region itself can become an environment which is innovative, and many scholars have referred to the opportunities to develop SMS-industries and craftsmanship in relatively peripheral areas (e.g. Camagni 1995).

Pulp and paper production plants are large and expensive and there are only a few industrial clusters in the world which promote the development of such technology. Forest industrial companies are often very familiar with advanced technologies and process steering, but instead of being developed 'locally' they are developed nationwide or worldwide. Industrial milieux are in the forms of global networks, but possess local ties in the form of employees (Dicken et al. 1994). The situation is comparable to the one of the mining sector (Liljenäs 1992, Tykkyläinen 1996).

Some branches of the forest sector, such as the manufacture of furniture, may benefit from a development policy of local, innovative milieux based on small firms. For example, furniture industry regions in northern Italy can be taken as good illustrations of these (Merlo and Fodde 1996).

3.4 Global Capitalism

There are various theories that describe the global process of the accumulation of capital and its implications for the spatial organization of production (Wallerstein 1974, Fröbel et al. 1980, Thrift 1986). The development of a particular region is a result of the combination of its chang-

ing role in the global economy and the distinctive history and resource endowment of the region itself (Massey 1984). The interpretation that the entire vertical process of production, from resource extraction to the final product, being subdivided into fragments which are assigned to whichever part of the world can provide the most profitable combination of natural resources, capital and labor, appears to be relevant, as forest companies become transnational.

Global capitalism as such explains, at best, the macro trends of development. The approach seems to be useful in explaining the global long-term shifts of the forest industry (e.g. chip board production). The current interest of forest industry companies investing in the Far-East and South America can perhaps also be explained by this approach.

3.5 Regulation Theory

Regulation theories argue that the main forces for socio-economic changes occur within national economies and that the world economy consists of relations between national economies and is shaped by the national basis rather than by rootless capitalism (Aglietta 1979, 1982, Lipietz 1986). Regulation theories emphasize that structural changes can be explained by the nation-specific mode of production and by shifts towards new modes, such as post-Fordism, in order to guarantee the accumulation of capital.

Along with advances in production paradigms and with the lessening of state intervention, the traditional modes of resource extraction and production are both under pressure to renew themselves and are also facing a spatial reorganization of resource production. Communities are outcomes of 'flexible accumulation', 'recycling of regions' and geopolitical struggles (Harvey 1987, 1989, Soja 1989). Thus, development varies by nation. The Nordic forest sectors have been successful despite of the deregulation caused by the incorporation of Finland and Sweden into the EU. Regulative practices can also hinder development as the Russian experiences show (Åslund 1997).

The forest sector consists of differing regulative practices. For instance, land ownership dif-

fers by countries and the nature of the wood-processing sectors differ not only due to a different raw material basis but also due to the different legislation and historical processes. At the local level, the idea of 'spatial selectivity', presented by Jones (1997), can be applied to processing forest industries. It would imply that the state has a tendency to privilege certain places through various state projects and regional policy instruments, as has actually occurred in Europe (e.g. Sachsen Papier in Germany). Hence, the modes of production are not purely global in various branches of the forest sector.

3.6 Institutional Approaches

Restructuring also results from the cultural basis of society. In addition to values, attitudes and cultural heritages, the pattern of power and authority in society is a fundamental condition for development (Friedman 1973, O'Neil 1992, Lash and Urry 1994, Amin and Thrift 1995). Forest industries and their geographical patterns are affected by the cultural environment of the society, so that hostile attitudes towards forest businesses or a heavy bureaucratic legacy, for instance, may hinder the development of the forest industry in a region or country.

The transition to Nordic forest technology in Russia provides an example where the western forest industry has faced this contradiction between the local way to work and the institutional setting of Russia (Sigurdsson et al. 1995). Furthermore, socio-personal characteristics and motives influence decision-making in resource sectors, e.g. wood-processing (Kortelainen 1998) and farming (Ilbery 1978). Similar points seem to be relevant in forestry and in the behavior of forest owners. For example, massive field afforestation programs in Ireland have faced opposition from farmers as they have been reluctant to afforest because of their resistance towards forested landscapes.

3.7 Resources and the Physical Environment

The location of a natural resource offers opportunities for establishing resource businesses on it, while the threat of natural hazards is a risk for businesses. The location of forest businesses can be considered from the standpoints of forest inventories and physical attributes of a region. This is usually the first stage of development planning. Climate, soil, access, location of deposits, etc. are physical factors influencing the location of forest businesses, and these factors have been a fundamental research domain in forest sciences. The relationship between physical and economic margins is a complex and dynamic one, and constitutes a central issue within the approach. The physical environment has very different properties varying in space with each resource having its own system of exploitation and occurrence on the earth (Miller 1979, Cutter et al. 1985). There would be no production without surveys and a subsequent knowledge of the possibilities offered by nature. On the other hand, this approach is not a sufficient argument for establishing any wood-processing industries – for example, successful furniture industries in Denmark are not based on local wood resources.

3.8 Keynesian Applications

Popular paradigms in the 1960s and 1970s emphasized growth centers, propulsive industries and multiplier effects (e.g. Darwent 1969, Tolosa and Reiner 1970, Hansen 1972, Moseley 1973, Buttler 1975, Gore 1984, p. 81–117). A typical example is the calculation of employment and income effects of hypothetical pulp and paper production complexes on a regional economy (Karjalainen and Tykkyläinen 1979). These approaches are most appropriate for analyzing the short-term effects of a shrinking basic sector on the production level of the local economy. Many regional policy measures incorporating subsidiary and redistributive elements contain rudiments of these theoretical constructions.

3.9 Product Cycles

Theories consisting of spatial manifestations of product cycles explain economic activity within regions in terms of the knowledge requirements of production during a product's life-time. The product changes from being innovative to being mass-produced and the product is initially manufactured in knowledge-intensive areas in its early phase and outside the cores in later phases (Norton and Rees 1979, Dicken 1986).

Relocation processes are of minor significance in the forest industries because the primary production system is immobile. Furthermore, the equipment of large mills is not easy to transport, but in the mechanical wood processing sector this relocation can take place. Old machinery can be relocated to a developing country, for instance, where production can be restarted.

3.10 Supply-side Policy

According to those who emphasize the role of supply-side factors in restructuring, major rigidities in market conditions should be ameliorated and removed with the aim of creating a more flexible economy (Chisholm 1990). Prices, exchange rates, incomes and the allocation of investment capital should all be determined by market signals (Welch 1993). Instead of a redistribution of the national wealth between regions and communities, as practiced in Keynesian regional policy, infrastructural investment, deregulation and an opening up of the regions to competition should be encouraged. The advantages or benefits of competition among countries is often the underlying idea behind the argumentation.

According to this approach, the contribution of infrastructure is an essential condition of production. The forest sector usually benefits from this policy greatly. For example, factors such as transport costs, communications, access to R & D activities and labor skills, have all been regarded as factors influencing development (Andersson et al. 1990, Vickerman 1991), although the role of urban development has been the main concern during the recent years. Infrastructural factors such as roads and waterways are crucial

for remote resource extraction, and improved telecommunications create new management opportunities.

3.11 Human Ecology and Environmental Management

Environmental management has its roots in the growing interest in applying principles arising from human ecology and environmentalism (Hägerstrand 1993). Restructuring in resource communities is increasingly being influenced by public resource management, environmental control and environmental impact assessment (Rees 1990, p. 277–445).

Various theories have been developed to deal with environmental goods and externalities (e.g. Bowers 1997, Tietenberg 1996). Legislation and penalties are implemented in order to improve the sustainability of the economic-environmental system and, at the same time, residential preferences are becoming increasingly sensitive to environmental factors which shape the structure of the community. Thus, resource decisions are influenced by environmental perceptions, attitudes, citizen involvement and environmental legislation (Mitchell 1989).

3.12 Environmental Concern

The emergence of environmental movements is traced back to the 1960s, when pollution caused by the forest sector was the main concern in industrialized countries. The social nature of environmental concern has been discussed at great length in geography (e.g. O’Riordan 1971, Sayer 1979), but it rose to the public agenda with the growth of radical environmental movements.

Debates over forest devastation, the recycling of paper, nature protection etc. have influences on the production decisions of the forest sector, and thus, a certain domain of theory describing and explaining people’s relations to nature and the environment must be taken into account when explaining the restructuring of communities based on the forest sector. For example, forest product industries in the USA have been moving from the northwest to the southeast of the country at

least partly because of environmental issues. In Europe, radical ecological movements are concerned with the preservation of old forests in Fenno-Scandia, and the customers of the forest companies have had the same concern. Theories and discourses related to human environmental behavior, values and social movements are growing in domain (Jagtenberg and McKie 1997), and are becoming increasingly important for the development of the forest sector.

4 What is There in Common?

The previous discussion reveals that numerous approaches and conceptualizations exist and that the theoretical legacy is amorphous. Nevertheless, a basic distinction can be made according to the main theoretical roots of the concepts which, for the most part, are related to in critical social theory, structuralism, or to neoclassical economic theory based on the concepts of economic liberalism. While many approaches in the two former emphasize the necessity of uneven spatial development as one of the main characteristics of capitalist societies, which it ultimately strives to overcome, the latter one stresses the balancing role of market forces in the development of spatial equilibria within such societies. Not very distinguishable from a neoliberal agenda, the most recent theories emphasize the role of the state in promoting dynamic competitiveness through the enhancement of social capital.

As a consequence of these theoretical and also ideological fundamentals of structuralism and critical social theory, the role of governmental intervention in regional development is traditionally seen as the redistribution of national (or even international) wealth by means of regulative or financial political instruments. The neoliberal ethos stresses, primarily, the provision of uniform conditions for competition and development, concentrating on infrastructure investments and the development of individual skills by means of education. Perhaps the most ‘modern’ approach emphasizes the role of the state in promoting the competitiveness of its region. The active role of the state in fostering development through training and R & D inputs is increasing,

and deregulation in society is occurring simultaneously.

A fourth strand of theories has evolved out of the environmental domain of socio-economic sciences, with the main criticism of market-led theories being that they are based on theoretical reasoning, which do not take into account the non-monetary values of natural resources and environment, thus favoring the externalization of environmental costs. Nature protection and sustainability should be accounted for by integrating environmental values into regional and national accounts. The government's role here is seen as countermeasuring cost externalization by the introduction of environmental tax systems. Further weight is given to other elements of 'green ideology', such as the importance of small units, subsidiarity and endogenous development. Increasingly, postmodern ethos is characterized by scepticism towards conventional theoretical approaches stressing political empowerment and participation, and clearly has similarities to the tradition of critical social theory.

It has to be noted that the forest sector consists of very different production processes and production units, which operate in various kinds of environments. One of the main peculiarities of the concept of the 'forest sector' is to be seen in the fact that it encompasses economic activities from all of the three traditional economic sectors (i.e. primary, secondary and tertiary). Forest estates and farms are as much part of this concept as are sawmills, pulpmills or carpenters as well as consultants and contractors. Sometimes even the economic activities of a single enterprise cover more than one of the traditional sectors. Thus, it is difficult to generate predictive hypotheses with relevance for the broad forest sector.

As has been the case in the resource communities in general, a search for an explanation of regional development has led to the finding that universal factors, geographical differences, and local and sectoral characteristics have not been sufficiently elaborated in regional development research (Tykkyläinen and Neil 1995 and 1998). Four viewpoints, i.e. general, local-specific, sector-specific and the policy-related approaches, are essential for explaining community development. The potentials of human agency to create development should be evaluated in this setting.

Firstly, development is interpreted as being more or less *general* or global, or even universal or law-like in some approaches. The theories often deal with a market economy, e.g. business cycles, changing patterns of consumption, and profit maximization is assumed to have certain spatial effects. These generalizations are based on the universal, nomothetic nature of events. For instance, profit-maximization, the principle of least effort, von Thünen's theory and the law of diminishing marginal utility are such and they are valid in the forest sector. The historical example of European deforestation, caused by the need of land for agriculture, settlement and other more profitable forms of land use is one of the best examples for the applicability of these concepts. This theoretical approach is also backed by developments in tropical countries in more recent times.

Secondly, *local-specific* factors in explanations deal with locational conditions, historical processes and opportunities. These explanations are related to spatial uniqueness and socio-economic processes *in situ*. The coniferous zone is a typical example of those unique, local-specific factors, which put Finland and Sweden into an advantageous position in forest business. The development of forest industries is more or less dependent on specific local features, e.g. the growth of forests, labor skills, local entrepreneurship, communications, the industrial composition, etc.

Thirdly, development varies from one industrial branch to another within the forest sector, some branches growing and creating new communities and some declining and causing a need for the reallocation of human and capital resources. Saw mills, paper-making and the manufacture of furniture, for instance, need different technologies and have very differing markets. Upward and downward swings in the market create opportunities for profit-making and cause closures, and innovations mean the replacement of previous production processes and products. Thus, *sector-specific* factors contribute to the development of communities. The forest sector is not homogenous in technology and market behavior, and hence, a common theory for explaining the development of the broad forest sector can be questioned.

However, this principle of sector specificity is not intended to prevent explanations of shifts from one branch to another. As an example, some companies have shifted from being 'mere' resource-exploiting logging enterprises to the role of consultants. This scenario can be said for some Finnish companies, which undertake consulting in Russia or in the tropical countries. Also, some recently-privatized, former-state owned forest enterprises, whose origins stretch back to former imperial estate administrations (e.g., the Austrian Federal Forests), are taking part in this process. It can also be stated that for enterprises originating in the manufacturing sector, the share of services, from total output supplied to the end-consumer, has become more and more important (e.g., furniture companies selling interior design services either directly or indirectly through catalogues and showroom arrangements). This shift is part of restructuring.

Fourthly, the local development scheme, often including individual and company responses, is the fourth dimension. The development scheme may be carried out by the company, local authorities and individuals, and it is thus *policy-related* at the different levels. Individuals operate as such or in a group, and they make choices regarding the future. They form the rules of capitalism by their own behavior, and also introduce anomalies into it. The statutes of recycling and conservation are good examples of a rapidly changing political environment in the forest sector. Theorizations operating at this level can serve to explain the different outcomes resulting from similar founding conditions. The phenomena of expansion, downscaling or steady-state in the development of forest industrial communities within the same region can be often explained in this way.

Finally, human activity from the perspective of everyday livelihood is an evolutionary process which creates economic and social practices and, finally, structures. The development process is a reflexive process and a learning process with resulting effects and feedback. Individuals, companies and groups directly and indirectly steer the outcomes of development. The contents of all innovative, developmental processes are ultimately dependent on human behavior. The *individual* factor is a necessary but not alone a suffi-

cient condition for development (Neil and Tykkyläinen 1998).

In the 1990s, the power of human agency became apparent, when the former socialist countries liberalized their economies. Individuals can realign their ideological beliefs, as was demonstrated in Eastern Europe in the late 1980s. Similarly, there are national political factors (for instance, environmental regulation) which may significantly influence the development of a community. Again, people can influence the formulation of the practical measures of policy. The instruments are more or less spatially planned but not independent of the spatial context of a country. Hence, by various initiatives and actions, people indirectly influence development.

The complexity of the restructuring processes should be accounted for through well-elaborated and broad explanatory frameworks. The forest sector operates globally and receives stimuli through the market, is dependent on the properties of geographical space, has sectoral dissimilarities and is involved with public intervention and private actors. Thus, it is essential to take these kinds of specific factors into account when attempting to explain the development of communities based on the forest sector. It is expected that a careful elaboration of the above factors increase the understanding of the functioning of the forest sector.

As one starting point for a more comprehensive explanation, one can recommend a comparative approach. Comparisons of rural restructuring processes and local economic schemes in an international context highlight different aspects of transformation, bringing out specific factors and giving a broader context within which to explain restructuring. Thus, research which explores and compares restructuring processes and describes cases in various countries may yield explanations which are more comprehensive than research carried out within one country.

5 Conclusions

The diversity of schools of thought implies evolution and competition in science. Different theories cover different parts of events and processes, and

a division of theories into relevant and irrelevant ones is neither easy nor even sensible, as each theory can be supported under certain conditions. Nevertheless, such seemingly ubiquitous, usually short-lived, theoretical relevance may also be taken as a sign of the ideological rather than the scientific nature of a theory. It also loses its value, if every conceivable reality 'can' be explained by it. Thus, the construction of potential falsifications would be the initial step towards assessing the predictive powers of any set of theories.

It is evident that many specific elements from varying theoretical constructions are of potential significance to explaining the development and restructuring of communities based on the forest sector. Overall, it seems evident that the explanatory framework should be relatively broad and dynamic and it should take into account local-specific, sectoral and policy-related factors and the role of human agency, which are often omitted in routine explanations of development.

References

- Aglietta, M. 1979. *A theory of capitalist regulation*. New Left Books, London.
- 1982. World capitalism in the eighties. *New Left Review* 136: 25–36.
- Amin, A. & Thrift, N. 1995. Institutional issues for the European regions: from markets and plans to socioeconomics and powers of association. *Economy and Society* 24(1): 41–66.
- Andersson, Å., Anderstig, C. & Hårsman, B. 1990. Knowledge and communications infrastructure and regional economic change. *Regional Science and Urban Economics* 29: 359–376.
- & Strömquist, U. 1988. *K-samhällets framtid*. Prisma. Värnamö.
- Bar-El, R. & Felsenstein, D. 1989. Technological profile and industrial structure: implications for the development of sophisticated industry in peripheral areas. *Regional Studies* 25(3): 253–266.
- Bowers, J. 1997. *Sustainability and environmental economics*. Longman, Essex.
- Brealey, T., Neil C. & Newton, P. (eds.) 1988. *Resource communities, settlement and workforce issues*. CSIRO, Australia.
- Brotchie, J., Batty, M., Hall P. & Newton, P. (eds.) 1991. *Cities of the 21st century*. Longman, Melbourne.
- Buttler, F. 1975. *Growth pole theory and economic development*. Saxon House, Farnborough.
- Camagni, R. 1995. The concept of innovative milieu and its relevance for public policies in European lagging regions. *Papers in Regional Science* 74(4): 317–340.
- Castells, M. 1996. *The rise of the network society*. Blackwell, Oxford.
- Chisholm, M. 1990. *Regions and recession and resurgence*. Unwin, London.
- Cutter, S., Renwick, H. & Renwick, W. 1985. *Exploitation, conservation, preservation*. Rowman and Allanheld, Totowa.
- Darwent, D. 1969. Growth poles and growth centers in regional planning – a review. *Environment and Planning* 1: 5–32.
- Davelaar, E. 1991. *Regional economic analysis of innovation and incubation*. Avebury, Aldershot.
- Dicken, P. 1988. *Global shift, industrial change in a turbulent world*. Chapman, London.
- , Forsgren, M. & Malmberg, A. 1994. The local embeddedness of transnational corporations. In: Amin, A. & Thrift, N. (eds.). *Globalization, institutions, and regional development in Europe*, 23–45. Oxford University Press, Oxford.
- Freeman, C. & Perez, C. 1988. Structural crisis of adjustment, business cycles and investment behavior. In: Dosi, G., Freeman, C., Nelson, R., Silverberg, G. & Soete, L. (eds.). *Technical change and economic theory*, 36–66. Pinter, London and New York.
- Friedmann, J. 1973. *Urbanization, planning and national development*. Sage, Beverly Hills.
- 1991. The industrial transition: a comprehensive approach to regional development. In: Bergman, E., Maier, G. & Tödling, F. (eds.). *Regions reconsidered, economic networks, innovation and local industrialized countries*, 167–178. Mansell, London.
- Fröbel, F., Heinrichs, J. & Kreye, O. 1980. *The new international division of labor*. Cambridge University Press, Cambridge.
- Gore, C. 1984. *Regions in question*. Methuen, London and New York.
- Hägerstrand, T. 1993. Samhälle och natur. *Region och miljö*. NordREFO 1993:1: 14–59.
- Hall, P. 1985. The geography of the fifth Kondratieff. In: Hall, P. & Markusen, A. (eds.). *Silicon Landscapes*, 1–19. Allen & Unwin, London.

- , McQuaid, R. & Hart, P. 1987. Western sunrise: the genesis and growth of Britain's major high tech corridor. Allen & Unwin, London.
- Hansen, N. (ed.) 1972. Growth centers in regional economic development. The Free Press, New York.
- Harvey, D. 1987. Flexible accumulation through urbanization, reflections on 'Post-Modernism' in the American city. *Antipode* 29: 260–276.
- , D. 1989. The condition of postmodernity. Basil Blackwell. Oxford.
- Husso, K., Leppälähti, A. & Niininen, P. (1996). R & D, innovation and firm performance, studies on the panel data of Finnish manufacturing firms. *Statistics Finland, Science and Technology* 1996:3.
- Hurter, A. & Martinich, J. 1989. Facility location and the theory of production. Kluwer Academic Publishers, Boston, Dordrecht and London.
- Hyttinen, P., Mononen, A. & Pelli, P. 1996. Forest related resources and problems of North-Karelia – the position of North-Karelia. *EFI Proceedings* 9: 157–180.
- Ibery, B. 1978. Agricultural decision-making: a behavioural perspective. *Progress in Human Geography* 2: 448–466.
- Jagtenberg, T. & McKie, D. 1997. Eco-impacts and the greening of postmodernity. Sage, Thousand Oaks.
- Jones, M. 1997. Spatial selectivity of the state? The regulationist enigma and local struggles over economic governance. *Environment and Planning A* 29: 831–864.
- Kangasharju, A. & Nijkamp, P. 1997. Innovation dynamics in space: local actors and local factor. A paper presented in the 37th European Congress of the Regional Science Association, 26–29 August, University of Rome "Tor Vergata", Rome, Italy.
- Karjalainen, P. & Tykkyläinen, M. 1979. Pohjois-Karjalan puunjalostusteollisuuden kehittämissäilytoehtojen taloudellisten vaikutusten simulointi. *Suunnittelu- ja ympäristö- ja teknologian tutkimuskeskuksen julkaisuja* 1.
- Kortelainen, J. 1998. Mill closure – options for a restart: a case study of local response in a Finnish mill community. In: Neil, C. & Tykkyläinen, M. (eds.). *Multicausal theory of local economic development, a geographical comparison of rural community restructuring*, (in press). United Nations University Press, Tokyo.
- Lash, S. & Urry, J. 1994. *Economies of signs and space*. Sage, London.
- Liljenäs, I. 1992. From mine to outer space: the case of Kiruna, a town in Northern Sweden. In: Neil, C., Tykkyläinen, M. & Bradbury, J. (eds.). *Coping with closure, an international comparison of mine town experience*, 247–265. Routledge, London and New York.
- Lipietz, A. 1986. New tendencies in the international division of labor: regimes of accumulation and modes of production. In: Scott, A. & Storper, M. (eds.). *Production, work, territory: the geographical anatomy of industrial capitalism*, 16–40. Allen and Unwin, London.
- Malecki, E. 1991. *Technology and economic development*. Longman, Essex.
- Malmberg, A., Sölvell, Ö. & Zander, I. 1996. Spatial clustering, local accumulation of knowledge and firm competitiveness. *Geografiska Annaler* 78 B (2): 85–97.
- Maskell, P. & Malmberg, A. 1995. Localised learning and industrial competitiveness. A paper presented at the Regional Studies Association European Conference on "Regional Futures". Gothenburg, 6–9 May.
- Massey, D. 1984. Spatial divisions of labour, social structures and the geography of production. Macmillan, London and Basingstoke.
- Masuda, Y. 1980. The information society as post-industrial society. Institute for the Information Society, Tokyo.
- Merlo, M. & Fodde, F. 1996. Some annotations on the role of forest based production chains in Italian regional economies. *EFI Proceedings* 9: 101–116.
- Miller, G. 1979. *Living in the environment*. Second Edition. Wadsworth, Belmont.
- Mitchell, B. 1989. *Geography and resource analysis*. Longman, Singapore.
- Moseley, M. 1973. The impact of growth centres in rural regions I, an analysis of spatial "patterns" in Brittany. *Regional Studies* 7: 57–75.
- Neil, C. & Tykkyläinen, M. (eds.) 1998. *Multicausal theory of local economic development, a geographical comparison of rural community restructuring*, (in press). United Nations University Press, Tokyo.
- Norton, R. & Rees, J. 1979. The product cycle and the spatial decentralization of American manufacturing. *Regional Studies* 13: 141–151.
- Oakey, R. & Cooper, S. 1989. High technology industry, agglomeration and the potential for peripherally sited small firms. *Regional Studies*, 23(4): 347–360.

- O'Neil, D. 1992. Mining investment in Africa, and Australian perspective. *Mining Review* 16(4): 34–40.
- O'Riordan, T. 1971. Perspectives on resource management. Pion, London.
- Rannikko, Pertti 1996. Onko Sivakkaa enää olemassa? Tutkielma yhteisöllisyyden muutoksesta. In: Kyläläiset, kansalaiset, Tulkintoja Sivakasta ja Rasimäestä, 21–51. University of Joensuu, Publications of Karelian Institute 114.
- Rees, J. 1990. Natural resources, allocation, economics and policy. Routledge, London and New York.
- Sayer, A. 1979. Epistemology and conceptions of people and nature in geography. *Geoforum* 10: 19–43.
- Sigurdsson, A., Nyström, N. & Gurova, S. 1995. Environmental protection and forestry in Russian Karelia. In: Tykkyläinen, M. (ed.). *Russian Karelia – an opportunity for the West*, 87–100. University of Joensuu, Human Geography and Planning, Occasional Papers 29.
- Soja, E. 1989. Postmodern geographies, the reassertion of space in critical social theory. Verso, London and New York.
- Stöhr, W. 1986. Territorial innovation complexes. IIR-Discussion 28. Wirtschaftsuniversität, Wien.
- 1987. The spatial division of labour and entrepreneurial strategies. In: Muegge, H., Stöhr, W., Hesp, P. & Stuckey, B. (eds.). *International economic restructuring and the regional community*. p. 30–44. Avebury, London and Brookfield.
- Storper, M. & Walker, R. 1989. *The capitalist imperative*. Basil Blackwell, New York and Oxford.
- Thrift, N. 1986. The geography of international economic disorder. In: Johnston, R. & Taylor, P. (eds.). *A world in crisis? Geographical Perspectives*, 12–67. Blackwell, Oxford.
- Tietenberg, T. 1997. *Environmental and natural resource economics*. HarperCollins, New York.
- Tolosa, H. & Reiner, T. 1970. The economic programming of a system of planned poles. *Economic Geography* 46: 449–458.
- Tykkyläinen, M. 1996. Commuting with on-site accommodation in the mining industry and its effects on spatial structures. *Fennia* 174(2): 223–243.
- & Neil C. 1995. Restructuring in resource communities: evolving a comparative approach. *Community Development Journal* 30(1): 31–47.
- Vickerman, R. (ed.) 1991. *Infrastructure and regional development*. Pion, London.
- Wallerstein, I. 1974. *The modern world system*. Academic Press, New York.
- Welch, R. 1993. Capitalist restructuring and local economic development: perspective from an ultra-peripheral city-economy. *Regional Studies* 27: 237–249.
- Wilhelm, B. 1997. Technology and Incubation Centres (TICs) – a living legend or current centres of competence. A paper presented in the 37th European Congress of the Regional Science Association, 26–29 August, University of Rome “Tor Vergata”, Rome, Italy.
- Åslund, A. 1997. Observations on the development of small private enterprises in Russia. *Post-Soviet Geography and Economics* 38(4): 191–205.

Total of 73 references