

HEIDI VANHANEN

SMALL FIRMS
IN THE PERIPHERY:
a discussion on the small
sawmills of North Karelia



METSÄNTUTKIMUSLAITOKSEN
TIEDONANTOJA 318

Kansantaloudellisen metsäekonomian
tutkimussuunta
Division of Social Economics
of Forestry

METSÄNTUTKIMUSLAITOS
Kirjasto

METSÄNTUTKIMUSLAITOS
METSÄNVALVONNAN TUTKIMUSOSASTO
YHTIÖTIE 10
PL 18
01901 VANTAA



METSÄNTUTKIMUSLAITOS
THE FINNISH FOREST RESEARCH INSTITUTE

Osoite: Unioninkatu 40 A
00170 Helsinki

Address: Unioninkatu 40 A
SF-00170 Helsinki
Finland

Puhelin: (90) 661 401

Phone: +358 0 661 401

Telefax: (90) 625 308

Telefax: +358 0 625 308

Telex: 121286 metla sf

Telex: 121286 metla sf

Ylijohtaja: Eljas Pohtila
Director:

Tutkimusjohtaja: Jari Parviainen
Research director:

Metsäntutkimuslaitos on maa- ja metsätalousministeriön alainen vuonna 1917 perustettu valtion tutkimuslaitos. Sen päätehtävänä on Suomen metsätaloutta sekä metsävarojen ja metsien tarkoituksenmukaista käyttöä edistävä tutkimus. Metsäntutkimustyötä tehdään lähes 800 hengen voimin yhdeksällä tutkimusosastolla ja kymmenellä tutkimus- ja koeasemalla. Tutkimus- ja koetoimintaa varten laitoksella on hallinnassaan valtionmetsiä yhteensä noin 150 000 hehtaaria, jotka on jaettu 17 tutkimusalueeseen ja joihin sisältyy kaksi kansallis- ja viisi luonnonpuistoa. Kenttäkokeita on käynnissä maan kaikissa osissa.

The Finnish Forest Research Institute, established in 1917, is a state research institution subordinated to the Ministry of Agriculture and Forestry. Its main task is to carry out research work to support the development of forestry and the expedient use of forest resources and forests. The work is carried out by means of 800 persons in nine research departments and ten research and field stations. The institute administers state-owned forests of over 150 000 hectares for research purposes, including two national parks and five strict nature reserves. Field experiments are in progress in all parts of the country.

Kannen kuva: Ashley Selby
Cover photo:

METSÄNTUTKIMUSLAITOS
METSÄNHOIDON TUTKIMUSOSASTO
RILLITIE 10
PL 18
01301 VANTAA

METSÄNTUTKIMUSLAITOKSEN TIEDONANTOJA 318
[Bulletins of the Finnish Forest Research Institute]

Kansantaloudellisen metsäekonomian tutkimussuunta
Division of Social Economics of Forestry

Heidi Vanhanen

**SMALL FIRMS IN THE PERIPHERY:
a discussion on the small sawmills of North Karelia**

Helsinki 1988

METSÄNTUTKIMUSLAITOS
Kirjasto

Vanhanen, H. 1988. Small firms in the periphery: a discussion on the small sawmills of North Karelia. Metsäntutkimuslaitoksen tiedonantoja 318. 40 p.

The paper addresses two questions central to acquiring an understanding of operations of small firms in peripheral regions: their continuity and the contribution of these firms to the communities with which they interact. Reference is made to the role of small firms in the production systems of their communities and regions, especially with respect to the flows of materials and information. A network approach is taken to explain how small firms operate in their environment and how such firms can contribute to the development of the periphery. The discussion is based on the empirical example of small sawmills in North Karelia, Finland.

Keywords: Development, network, peripheral region, small firms, small sawmills

Author's address: The Finnish Forest Research Institute, Department of Forest Economics, P.O. Box 37, SF-00381 Helsinki, Finland

ODC 832.1:791.3+911

ISSN 0358-4283

ISBN 951-40-1028-0

HAKAPAINO OY, HELSINKI

CONTENTS

1	THE AIM OF THE PAPER	5
2	HOW DO SMALL FIRMS OPERATE IN THEIR ENVIRONMENT?	7
2.1	The functioning of the production system	7
2.2	The role of peripheral areas in a large-firm dominated production system	11
3	HOW DO SMALL FIRMS BENEFIT THEIR COMMUNITIES?	14
3.1	Peripheral production system and regional development	14
3.2	Small firms in peripheral networks	15
3.3	Small firms' role in local development	18
3.3.1	Growth versus profitability	18
3.3.2	Adaptability	19
3.3.2.1	Flexibility	20
3.3.2.2	Innovativeness	22
3.3.3	Resources connected with the environment	23
4	HOW DO SMALL SAWMILLS OPERATE IN NORTH KARELIA?	25
4.1	The North Karelian setting	25
4.2	Small sawmills' operating networks	27
4.3	Small sawmills and local development	31
	REFERENCES	35
	APPENDIX 1 Map of small sawmills in North Karelia	40

1 THE AIM OF THE PAPER

This discussion paper is part of an ongoing project investigating the role of small-scale woodworking industries in local development in peripheral areas, with the small sawmills of North Karelia, Finland, being used as an empirical case study. Previous publications of the project have dealt with the entrepreneurs in peripheral areas from the humanistic point of view, with their behaviour and with their perception of their environmental potential (Selby 1983, 1984, 1985, 1986, 1987a, 1987b), as well as with the operational and structural typology of the small sawmills (Vanhanen 1985).

The aim of this paper is to review the role of the small enterprises in the development of peripheral areas.

In particular, the role of small enterprises in the production systems of their communities and regions is examined. Reference is made to networks which arise from the linkages within the production system, from the social, socio-economic and cultural system, and the multitude of functional and social linkages created in and by the firm and the environment.

The paper examines two questions: i) how do the small firms operate within their environment? and ii) what potential do small firms possess which will benefit their community?

In this paper, the term 'periphery' refers to the distinction between centers and their outlying areas as a functional definition, while 'rural' refers rather to the quantitative definition. The 'periphery' operates at several hierarchical levels; e.g. seen from the developed areas of southern Finland, all of Northern Karelia is a periphery. From Joensuu, the Capital of North Karelia, the adjacent communes are not necessarily seen as a periphery, but merely as rural areas. Economically, Finland functions as a single unit within the global hierarchy of production and information systems, with North Karelia sharing the same peripheral

problems as any outlier of the global production and information networks.

Small enterprises are often defined together with medium sized enterprises, and "small and medium-sized enterprises" (SMEs) is used as a common concept. The definitions of small firms vary from country to country, and both quantitative and qualitative definitions have been used. The most common quantitative definitions are based on the numbers of employees, the turn-over or the amount of tied capital in the firm. For example in OECD countries all firms with less than 500 persons are considered SMEs and the recommended upper limit for small firms has been 50 employees.

In Finland small and medium sized firms are generally divided at 100 persons employed (with small firms up to 20 employees; Virtanen 1985), and large and medium sized firms again at 500 persons. In the Industrial Statistics 73 percent of the number of industrial firms in Finland are in the size category of 1-9 persons.

Small sawmills are used as an example of enterprise. Interview of small sawmills in North Karelia was done for the project in 1982, and the small sawmills discussed here fall outside of these definitions. They employ anything from one part-time worker to a few permanent employees. Their production ranges from a few tens of cubic metres to 5 000 cubic metres a year, which was the upper limit of including the sawmill in to the survey. Common to all is their small-scale operation, and commonly close connection into agriculture as second income.

Chapter 2 addresses the question as to the operation of small firms in their environments by examining the production system and the formation of networks. Chapter 3 addresses the question of small firms' potential to benefit the communities in which they are located by examining the role of small enterprises in the networks of peripheral areas. Chapter 4 discusses the empirical example of the role of small sawmills of North Karelia in a network context.

2 HOW DO SMALL FIRMS OPERATE IN THEIR ENVIRONMENT?

2.1 The functioning of the production system

Because all economic activities occur in space and time, an enterprise is a spatial organizing institution which reacts to environmental changes (Hayter & Watts 1983). The economic units of an area are in a functional system and consequently possess reciprocal relations with each other. The units within this system constitute the production system of the area.

The production system is complex, possessing a multitude of hierarchical levels. Some units have a stronger, more dominating position than the others. Also the spatial interaction field of each unit varies: one is part of a global hierarchy, another operates very locally with few contacts outside the home area. Exchange and interaction of the units of the production system not only consist of transactions of material goods including material, energy and capital, but covers the exchange of information, experience, tradition as well.

The nodes of the production system are connected with various flows and networks including both material and information in varying combinations. First there are programme flows which concern the routine activities and easily transported standard supplies. Secondly there are planning flows changing these material processes, and finally, at the highest organizational levels, the orientation flows, which give direction to the overall operations, direct changes into the firms and into their environment (see figure 1).

The contents of the information flows differ: the decisions on the technical or manufacturing level - programme decisions - are based on highly structured and standardized information. These flows run parallel to most of the material flows. In the orientation flows, the material content is almost non-existent.

Flows of material, arising from the operative work, and information networks from planning and management of the same unit are largely, but not fully, corresponding each other between the operating units. The contents of the flows may, however, differ. This is especially true as these flows indicate - and arise from - the macro-system of power and dependencies between units and regions. The production structure reflects the power structure and, at the same time, the existing contact systems do effect the production costs. Especially at the local level, it is chiefly in this interplay of flows of information and material, and less in uni-dimensional discussion of transport costs that determinants of the existence of local production systems within the external framework of the national or international system should be sought (Fredriksson & Lindmark 1979).

Flows require different channels: while the orientation decisions at the institutional level are associated with highly unstructured information, they are often attached to personal face-to-face communications. The more specialized or non-routine the information becomes, the greater the advantage of the direct personal contact (Thorngren 1970). Here the interest no longer lies only in the quantity and quality of the information flows themselves, but in their combination, i.e. ways and means of combining fragmented information spread between various parties and specialists (Andersson et al 1984). In this respect, direct personal contacts are superior. The environment is common to all the participants and so the risk of misunderstanding is less than in other types of contact. Misunderstandings, if they do arise, can be corrected immediately; the element of uncertainty is less than in information transactions through other channels (Törnqvist 1970;28). Indirect contacts are best suited to the transmission of simple, well-structured, routine information (Törnqvist 1970;27).

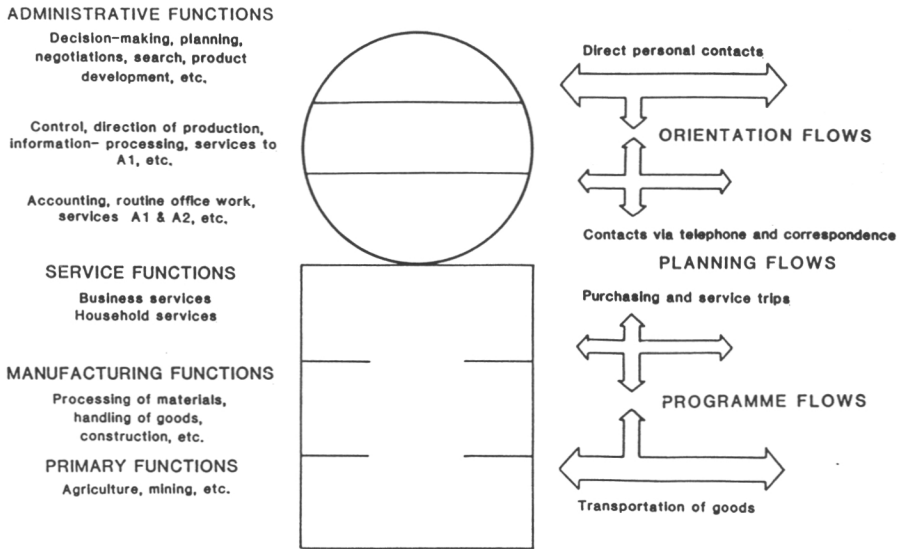


Figure 1. The flows and contacts within and between firms (modified after Törnqvist 1973;87).

The hierarchy of networks between the operating units of the production structure also exists within the firms. Different parts of an organization operate at different power and dependency levels according to their functions. Both information and material flows take individual shapes and channels at different operational levels both within the organizations and within the production system (figure 1).

Changes in the production structure are changes in the absolute and relative balance of its component parts. Innovations are channelled through the production structure network. At spatial level the existing structure determines the adaptability of the area, i.e. to what extent the area is able to receive exogenous innovations or to what extent it is likely to create innovations and adopt them. The production structure determines the intensity and route of the diffusion of the innovation.

Development is considered to be quantitative growth or structural change or both. New products, markets, or a new production technology created by innovations (even

administrative innovations, cf. eg. Aho 1985) increase production quantities (cf. Lasuen 1969), and/or create structural change in the production system. Innovations are critical factors especially in the initial stages of development. However, for a continuously self-sustaining development a continuous chain of innovations is required. Information flows in the production system contain the processes of birth, diffusion and adaptation of innovations. The information containing innovations or their potential is carried by the orientation flows, and innovative information is also connected with the utilization and demonstration of power.

The contacts between firms in the production structure occur at several levels and through several media, depending on the organizational structure, the character or branch of operations, and the level of specialization of the firms. Further, the production structure and each of its units function in close and continuous interrelationship with its environment. The task environment of a firm is that part of the total environment to which the firm cannot be indifferent (Ewers & Wettmann 1980;170). However, the defining of the task environment is made difficult by eg. the existence of both direct and indirect firm-environment links (cf. Hayter & Watts 1983;159). Especially in a long-term perspective, an extensive environment must be considered. Thus the encompassing environment is tied to and operates directly or indirectly on the production system and its individual components. The border line between the task environment and the value environment is vague: the value environment consists of the superstructure in which the firm is supposed to operate. It may include potential customers and suppliers who may indirectly affect the firm's chance of continued existence such as by opening new markets or developing new materials and products (Fredriksson & Lindmark 1979).

The task environment of each firm is different. Further, small firms operate in a different task environment from large ones. It is not only a question of physical or technically operational contacts, but rather one of power

relations, socio-economic, social and cultural effects and contacts. The network of firms, or the production system, continuously adapts itself to the changes occurring in the environment, and vice versa, depending on the power relations.

Spatial development and changes must thus be considered as part of a more extensive system than just the physical production contacts. Any changes in the information flows or the orientation processes have a far reaching and possibly areally extensive potential (Andersson et al. 1984).

2.2 The role of peripheral areas in a large-firm dominated production system

The continued specialization of the economy and the integration processes increase both the exchange and dependency relations between the economic units. Economic and related activities have concentrated to fewer units. Production systems have tended to become tighter and more controlled. The concentration of economic activities and of decision making has moved the decision making and orientation activities to larger units and to larger centres; information flows have become concentrated.

The national production structure is dominated by larger firms. Many larger firms have a hierarchical location pattern: the administrative and planning functions are located at larger centres, leaving the production functions to the peripheral areas. The concentration of the planning and management functions - also as to the decisions of the peripheral production units - in the central areas leaves the peripheral areas outside of the innovative and orientation information flows. The special features of the peripheral areas are not given consideration in this process. Even decisions concerning sub-contractors' decisions about their programmed flows, which deal with routine production processes, may all too easily be taken by the large centralized units.

From the standpoint of the periphery, also the location there of large firms may, over time, have only negative effects on the region due to the unbalance such enterprises bring to the local economy. The physical and psychological distance between large firms decision-making processes and the local reality may be unbridgeable (Sundin 1980;12). Also the business climate is often more difficult and harder to deal with for small firms in a region dominated by large companies (Chans... 1983;33).

Further, large producers may leave the resources of smaller communities unused because they do not fulfill the large plants' quantity or quality requirements, which are in turn dictated by the scale of their operations. The resultant "residual" of unused resources at the local level constitutes a valuable reserve: reserves not only of materials, but also of human resources. The scale of such reserves is most appropriate for small firms in small communities.

With increased communications and new media the peripheral areas could be expected to become more closely tied to the information networks of the nation and also globally. However, the more complicated, non-routine information flows, attended to by personal face-to-face communications are distance sensitive. A remote location makes this communication more difficult to handle and maintain. Peripheral areas may easily remain outside the innovative, direct transmission of information between individuals. In the production structure the periphery continues to perform the production functions, with power to decide only on material flows and other programmed functions. The act of being left-out of development is a cumulative one: when new contacts are built they are overwhelmingly dominated by direct personal communication, which has been demonstrated to be the most "effective" form of intercourse. The share of organizations' direct personal contacts has been shown to range between 10 and 20 per cent of the total (Törnqvist 1970;27).

Thus, regional inequalities in an integrated information-based society are no longer regulated by the location of raw-materials and energy, nor by other physical resources, as was the case with early agriculture and, later, early industrialized societies. Instead, production is restricted and regulated by the basic infrastructure, various and multi-levelled decision-making systems, and variations in population distribution, etc. (Andersson et al, 1984;93).

3 HOW DO SMALL FIRMS BENEFIT THEIR COMMUNITIES?

3.1 Peripheral production system and regional development

A large or medium-sized branch of a firm may have a considerable affect on a peripheral area's employment structure. Their potential to create, speed up or even maintain local growth has been considered to be limited due to their operational structure. Regional growth is given strength and volume by large firms, but the basis for impulses for local change are formed with the small or medium size enterprise (Spilling 1983). Size is, however, not the decisive factor. More important is the firm's mode of operation and orientation. The sector concerned, and its structure, may favour small-sized firms. Thus the firm, while "small" by definition, need not necessarily operate as a small firm and viceversa.

The numbers of enterprises in the very smallest size classes (less than 5 persons) have rapidly declined in Nordic countries during the 1970's. In Finland, however, there is the indication that the number of firms in this category have remained approximately at the same level during 1970's. However, the numbers of small sawmills have declined considerably, i.e. by nearly one third in the eight year period from 1972 to 1980 (Huttunen 1974, 1981).

Regional development aims at improving regional and/or local welfare. In a spatial perspective, the qualitative features are stressed on the side of quantitative changes. Along with welfare quantity, i.e. level of living, arises the question of the quality of life (cf. Siirilä 1984, Kuitunen 1983, Nenonen 1982).

Local development should begin on the terms of the local community, thereby constructing the localities' economies from below. Development should include all local resources be they material resources, human resources, abilities, capital and environment. None of these resources are likely to be sufficient for development on their own, divorced from the

other resources mentioned. A basis for development is, therefore, a working and integrated local production structure.

A holistic view is required in order to be able to cope with the integrated structure. The dependency relations in peripheral areas are becoming increasingly complex, due to eg. the structural changes in farming. Even with a decreased rural population - partly due to the reduction - the number of sources of income of rural households have been increased. Traditional farming composes only a smaller share of the incomes of farm households today. This means ever more complex dependency patterns of rural households and also of peripheral firms. Changes both in economic and social structure on the local markets, the production system, social networks and the psychological support provided.

The holistic view is not easy to approach while it covers several disciplines. The sectoral view has been predominant. Firms in regional economics have been treated as black boxes (Håkanson 1979, see also Ramström 1974), and the main interest has been in the study of separate functions of a firm. Also, business economics and national economics do not have the tradition of empirical research. The amount of empirical research in firms has been negligible (see eg. Mäkinen 1976).

3.2 Small firms in peripheral networks

Growth and development in an area require active and preferably complementary relations between the operating units in order to attain the - possibly cumulative - benefits of the multiplication mechanisms and to arrive at structural change. While large firms dominate the production structure at the national level, small and medium-sized firms play a complementary role in the production hierarchy. Small and large firms are not, therefore, in direct competition. The small firms are more or less invariably based on a narrower base, serving a limited market.

Small firms constitute the base on which the large market-orientated firms have to rely, at least partly, in order to satisfy their supply of input goods. Nevertheless, the production structure of the peripheral areas does not readily provide complementary or auxiliary production relations, due to the limited production alternatives and the small number of firms. Complementary relations require matching production profiles.

The small firms in peripheral areas are rarely able to fulfill the sub-contracting requirements of large firms, either because of their narrow range of goods, or because of their limited resources (Fredriksson & Lindmark 1974;533). Due to the lack of, or non-matching types of local enterprises, the peripheral firms are compelled to search for business relations outside the area, and the sought-for development effect leaks out of the area. The local growth and development mechanisms therefore have gaps and the local development effect, even if once initiated, may be of short duration. However, while the basic level lies low, even the smallest increases in production and material and information flows in the peripheral areas are significant in the long run (Fredriksson & Lindmark 1977;384).

The self-generating process of development requires the consideration of both material and information flows. With scarce production facilities inside an area, the information flows within the area will be particularly meager. The innovative, change-inducing information flows pass the small firms, with their limited production contacts. However, the small firms have active diversified local contacts. "Firms are not exclusively mechanical phenomena; rather they are organisms which through adaptation and strategic planning can handle interference from their environment" (Fredriksson & Lindmark 1979;157).

Small firms operate in the local community in multiplicity of ways. To the entrepreneur in the local community the total environment for business is critical, because the role and

dependencies of the small firm are all inclusive, incorporating not only economic, but also direct socio-economic and social elements. Thus the task environment of small firms, as discussed above, includes not only the technical factors of production, but also social factors, environmental values, attitudes and social norms (cf. Selby 1984) to a larger extent than a larger firm, even in the same location.

A firm's dependency on its environment is not simply the relationship between the firm and its local community. Any local community acts as a social unit, irrespective of its size, and not even the simplest local society can solve its problems in isolation. Thus even the relation between the local society and the rest of the society (eg. centre-periphery relations) enters into the relation between the firm and the local society (Veggeland 1977).

The multi-phased, multi-level functioning of the local production system in its environment no longer permits the assumption that firms operate with the single goal of economic rationality. This is specially true in peripheral areas. The classical postulates of profit-maximization are replaced with discussion in terms of behavioural sciences of processes underlying and governing the entrepreneurs' actions (Fredriksson & Lindmark 1979). The socio-economic ties between enterprises are rather characterized by 'social rationality' than economic rationality (Johannisson 1984;24). Especially the smallest entrepreneurs may be boundedly rational, raising and lowering their aspirations according to environmental stimuli, via the market place, and generally operating at a level which satisfies their minimum aspirations (cf. Simon 1957). This is especially true to small sawmills, having a second income from agriculture (see Selby 1984 & 1986).

3.3 Small firms' role in local development

3.3.1 Growth versus profitability

The success - or failure - of a firm is transferred to its environment, as depicted in figure 2. The essential goal of all organizations and firms is their own continued existence. One of the basic elements of the market economics is that the continued existence is guaranteed by high profitability. The success of a firm can be considered as one of the prerequisites for the development potential. However, not all successful firms do possess that potential. Also the success of a firm may be viewed from several aspects. The business success does not necessarily tally with the social or regional success of a firm (see discussion eg. in Johansen 1977).

In business profitability in sawmilling the advantages of large scale production are not valid the same way as in other production (see eg. Sahateollisuustyöryhmän ... 1983, Kunnas 1981). Small sawmills may be as profitable as large ones (see eg. Høsteland & Akselsen 1980).

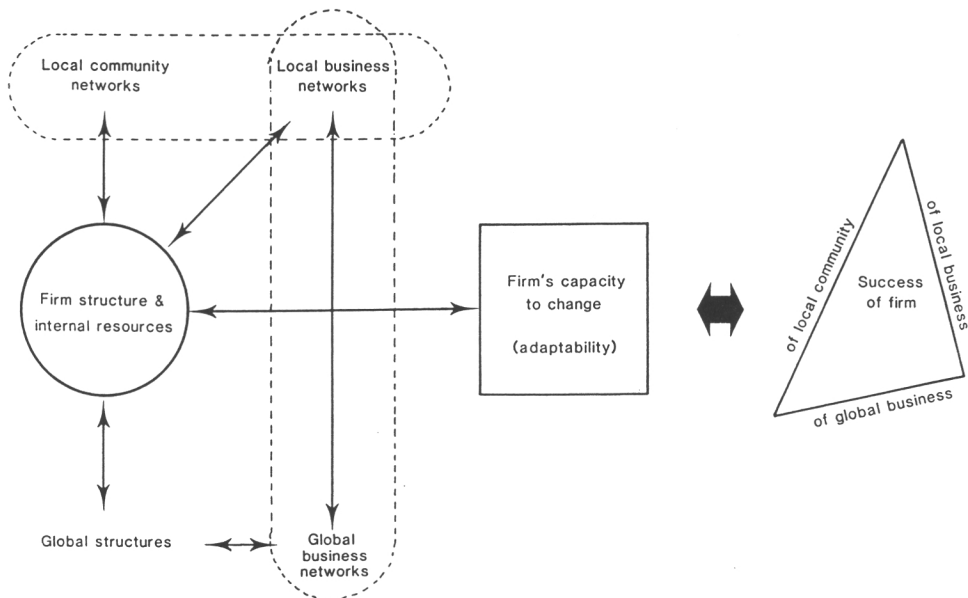


Figure 2. The firm and local development (cf. Johannisson 1985b & 1986, Mäkinen 1976).

The business success of an enterprise is closely tied to the concept of profits. The quantity of profits, and the growth and expansion of a firm are partly alternate consequences from the success. Growth may also be seen as a factor reducing profitability, even though in real world growth and profitability go closely together (Ruuhela 1972). The norms of the markets do not condemn firms fit to survive on the basis of profitability only or on growth alone, but specifically on the combination of these two (Ruuhela 1975).

Profitability is normally seen as a means to growth. However, the growth of an enterprise is not automatic, but is possible only when growth is a part of the stated goals of the firm- or the entrepreneur. The willingness to grow depends- besides on the profitability - on the market situation, the qualities of the leaders and of the firm and its line of business as well. It has been most difficult to draw any specific conclusions on the definite impact of any of these factors on the growth of a firm. Also the empirical results have been vague and difficult to interpret (Ruuhela 1972).

3.3.2 Adaptability

Essential for the potential of local development impact of a firm is its capacity to change. A firm's qualitative and quantitative potential to change may be called its adaptability. This capability appears empirically in the firm's success, which may range from mere survival to booming expansion.

The adaptability of a firm reflects its strategic active position in the interplay of the production structure and the environment. On one hand it is determined by the quality of the personality and the internal resources of the firm. Small firms are individuals with specific personal characteristics. The personality of the small firm consists of i) the structural and operational qualities of the firm, including the line of business and the technology, and ii) the personal resources ie. the personality of the entrepreneur (see eg.

Tamminen 1981, Virtanen 1985, Selby 1984). In a large firm, the structural qualities are more emphasized.

On the other hand adaptability is shaped from the outside, by and with the environment. Each small firm identifies itself locally and globally. By globally we mean anything beyond the local scale. Local business networks are, however, part of the global business network and the global production system. The global and local directions are not mutually exclusive. Local or global identity, or rather the balance between them, is defined by the environment of the firm, but is structured by the person in charge, the owner-manager. Community structure and business networks, together with the structure and internal resources of the firm, determine the adaptability of the firm. In other words, the internal and network resources of the firm together define its adaptability (Johannisson 1986;7).

The direct quantitative growth element, eg. employment and income effects through acquisition of inputs by a small firm are included in the chain both through the community and business networks. With increased employment and increased incomes, the local community structure and the production structure, locally or globally, are strengthened.

Considered qualitatively, a firm's adaptability may be described by flexibility and innovativeness. These are not clearly separable, and are at least partly overlapping. They both refer to the networking capacities of the firm. Flexibility relates to the structure of a firm, while innovativeness emphasizes the ability of a firm to collect and to utilize information.

3.3.2.1 Flexibility

Flexibility is possible only where both the structure of the firm and its decision-making processes permit it. A basic requirement for flexibility is the acquirement of information. A small enterprise attempts to adapt to its

environment by structurally reacting to any significant changes in the environment so as to minimize conflict (cf. Mäkinen 1976;39). Flexibility is therefore a part of the strategy of the firm.

Flexibility relates not only to the internal structure of the firm and its resources, but also to the small firm's position in the production structure and in the information network. Thus, the small firm's ability to acquire information concerning changes in the business environment, and to be able to use that information, are paramount (cf. Selby 1987a & b).

Large firms often suffer from large fixed costs and the necessity to maintain production at a given level. Large firms, in this respect, are vulnerable. Flexibility is seen as a prerequisite of the small firm's success in maintaining its competitive edge and therefore its viability. In particular, it is easier for the small firm to reorganize management and production alike, and to produce non-standardized goods to meet customers' special requirements.

Flexibility may not, in fact, be a chosen property of the small firm. Rather, it may be dictated by the business environment: flexibility being a means to survival. Indeed, "the flexibility attributed to small firms may be a myth" (Sundin 1982). Because small firms have little chance to actively affect their environment, via their flexibility they can at least act defensively (Lindström 1974;25). Especially in peripheral areas, structural changes in the economy have been, and will continue to be, very strong, and this demands from firms located in the periphery the continual need for adjustment.

3.3.2.2 Innovativeness

The second dimension reflecting a firm's internal adaptability and relationship to the environment is internal

innovativeness. Innovativeness - as well as flexibility - of a firm is closely dependant on the ability of a firm to collect information and to use it. The success of an innovation process in a firm depends simultaneously on the internal characteristics of the firm and on the intensity of its exchange with its environment.

A firm's potential to innovate increases with its accumulation of information. Large firms are rather more contact-intensive than smaller firms, but while the information in large firms may be dissipated through many channels, in the small firm information is invariably accumulated around the person of the owner-manager. It is his ability to use information which determines the innovativeness of the small firm.

It is just through their flexibility and their internal indivisibility that small firms possess a high possibility to innovate, even though their economic possibilities for extensive R&D activities are mostly very limited. It has been contended that small firms' possibilities to innovate, given their financial limitations, are as great as large firms. However, large firms are able to adopt new innovations faster and more extensively (Lasuen 1969;51).

The environment is decisive for the innovation performance of a firm. The benefits offered to the small firm by the environment of the peripheral areas are limited compared to central areas. Thus peripheral areas are restrictive with respect to the innovative performance of the individual firm: low degree of labour market diversification, the low density of information, and the scarce availability of business services (Ewers & Wettmann 1980;168), not to mention social barriers to innovation (cf. Selby 1984).

Finally, the internal life-cycle of small firms also affect their potential for innovation. Innovativeness often decreases with the age of the entrepreneur. In other words, the innovativeness of a firms has its own life-cycle. The generation transfer process in the small firm can therefore

constitute a rejuvenation, with a renewed life-cycle of innovativeness. However, because of market limitations, the number and nature of innovations originating from small firms will depend to a large degree on stimulation coming from the local markets (Rothwell & Zegveld 1983). Stagnant markets tend to lead to a stagnant technology - in the wide context of the word - in small and medium sized firms, and following this, a low level of innovativeness.

3.3.3 Resources connected with the environment

The two-way mutual relationship between a small firm and its environment is essential for commercial operations as well as enabling the firm to transfer development to the area.

The community provides the firm the setting for its operations. At the village level, the business environment may vary considerably because of social structures, social values, etc. A good example of differences between apparently similar villages is given in a comparative study of two North Karelian villages, Sivakkamäki and Rasivaara, by Oksa & Rannikko 1985, see also Johannisson 1983b.

In an ideal case the community provides for its firms the arena - a meeting place - for the mutual exchange of activities, operations, opinions, and viewpoints between the various operating units in the community. Also an enterprise in its environment must be seen as a sequence of decisions in time: the initial choices can be changed- and even reversed- should the environment - or the firm - change (Barth 1963;13). Changes in the environment involve shifts and dislocations in all the components of the environment-small firm system, eg. changes in population, settlement pattern, communication networks and value systems bring about wide ranging changes in business opportunities and relations. The time perspective for these changes in the environment is longer than for the changes occurring in one firm. The long-term changes in the basic structure of the communities do not occur simultaneously in the individual firms but may effect

the firms at different time periods (see eg. Sundin 1980;16-18), due to thresholds, indivisibilities, inertia, etc.

4 HOW DO THE SMALL SAWMILLS OPERATIVE IN NORTH KARELIA?

4.1 The North Karelian setting

North Karelia in early 1980's (see a map, Annex 1) has a land area of 17 800 km², and a population of 176 000. In the area in 1981 there were six large sawmills producing over 50 000 m³ of sawn timber per annum, four producing between 5 000 and 50 000 m³, and altogether 60 smaller sawmills. These 60 sawmills are the subject of the small sawmill project. An interview of small sawmills was conducted in North Karelia in 1982.

In the past few years the villages of North Karelia have experienced a re-birth of the self-reliance development efforts. Village committees have been founded in several communities, although not all of them are active. Consequently, the village atmosphere for small enterprises has become more positive in the villages with a range of mutual activities. However, communities must be able to offer small enterprises suitable conditions for their operation if positive local effects are to be gained. Further, if a community does not reach a certain threshold size, its external relations will dominate over its internal ones or completely exclude the possibilities of firms or required infrastructure. Generally, the basic conditions for small enterprises are difficult to provide in those areas where a large industry dominates. In North Karelia there are small and large sawmills, while compared to size distribution in other areas of Finland - medium sized sawmills are very few. Large and small capacity sawmills do not compete with each other in the product markets. The large sawmills are mainly geared to the export trade, whereas the small sawmills satisfy local demand for sawn timber. In North Karelia there is comparatively little other small-scale industry, nor has the area a tradition of small-scale enterprise.

The small sawmills in this study are defined as sawmills producing less than 5000 m³ per year. Most small sawmills of

this size operate only part of the year, and provide a subsidiary income for farming or other rural occupation. Small sawmills are the most common processing establishments - industrial units - together with small metal workshops in the Norht Karelian rural areas. They cover a wide range of activities. Some provide only sawmilling services, with unskilled labour being provided by the customer or his helpers. Some sawmills do only saw commercially, acquiring the sawlogs, sawing them, and selling the sawn timber to the public or through some other outlet. Some export part or all of their produce. A few sawmills have a further manufacturing or reprocessing line, producing planed timber, impregnating, or manufacturing various wooden products. The products range from wooden cottages to special purpose panels. The sawing equipment used may date from the time of establishing the sawmill, possibly even 60 years ago.

Some sawmills operate only within their neighbours or immediate vicinity, rather as neighbourly help; some portable, mobile units may cover distances of several hundreds of kilometers. Markets are, with the exception of those reprocessing and exporting, mainly local. By using local raw material, their role in local development effort is emphasized.

Knowledge of the location of the sawmills in their operating networks is essential for understanding their development potential. The actual realized income and employment effects can be measured by the backward and forward linkages from the sawmills. This requires the measuring of the quantity and of quality of the flows into and from the small sawmills, as well as their spatial direction. This would be an input-output study of the sector. The material transactions of the small sawmills are, however, closely interwoven with their information flows and social contacts, ie. into the non-material transactions and the rural socio-economic networks. Some work on this has already been published (Selby 1986).

4.2 Small sawmills' operating networks

Small firms, while operating holistically in their environment, function both in their community structure and in the local production structure. The local business network again is part of the global production system (see figure 2). Both networks contain material and information flows of varying qualities and combinations.

Advisory services might well be an important contribution to the workings of small firms in peripheral areas. However, it seems, in fact, that small firms rarely use such services. Those services used are invariably rather ordinary, merely supplementing the slender work force typical the small firm, e.g. an accountant may handle billing and book-keeping activities. Only exceptionally do small firms use advisory services or consultants to improve or extend the working base of their enterprise.

The nature of small firms operations and their products rarely requires the products of other firms or outside services. The basic raw material, saw logs, are often purchased from local sources creating local income through stumpage. Contracting sawmills do not even have to bother with raw materials as they are selling only their services. They are also free of the task of selling timber and fulfill an essential service function in the location. The sawn timber and manufactured wooden products of the commercial sawmills are either sold locally or fulfill regular orders from a wholesaler. Those mills manufacturing wood-based products are, perhaps, the only small sawmills with more extensive and varied contacts. These mills often work as sub-contractors, and may otherwise require to market their products. Thus, the contracting sawmills can be seen to have very limited networks, with only the commercial sawmills with reprocessing possibilities effectively developing an meaningful network of contacts.

Material and information flow networks act to integrate the production structure of an industrial sector, however small.

While the material flows of the small sawmills are modest, they have considerable significance at the local level.

Also, it is not only the frequency and quantities involved in the flows, but the quality of the linkages in the network which carries the change potential. Programme flows and programme contacts are mainly transfers of standard material and standard information between the firms. The planning, and especially the orientation flows, contain qualitative non-homogeneous information and flows of special materials. The networks could simply be dichotomized into standard and special supplies and information. This dichotomization of material flows and the information associated with them is, it appears, essential to the understanding of spatial structures of production systems (cf. Fredriksson & Lindmark 1979). When considering the limited range of materials involved in the sawmilling activities of the small sawmills most of their information content is very standard as well. Their adaptability on that basis would appear to be limited. The qualitative, non-standard information flows must be sought outside the production contacts of the sawmills.

The small firm's operating network largely corresponds with the entrepreneur's personal network. The contact systems of an entrepreneur are often naturally tied to business transactions between entrepreneurs (Johannisson 1978). The quality of the network an entrepreneur creates is very dependant on his personal attributes, such as creativity, versatility and general societal skills (Johannisson 1986). This emphasizes the view that entrepreneurship can be seen as a way of life, not merely as a profession.

In the personal networks of the small entrepreneur (figure 3), most contacts have simultaneously several characteristics. They can be instrumental, affective or moral, or any of their combination. Network linkages often emerge out of coincidental meetings and affective attachment (Johannisson 1985a). Through his personal network the entrepreneur is integrated to the society. All the local networks mirror the local anchorage of the entrepreneur.

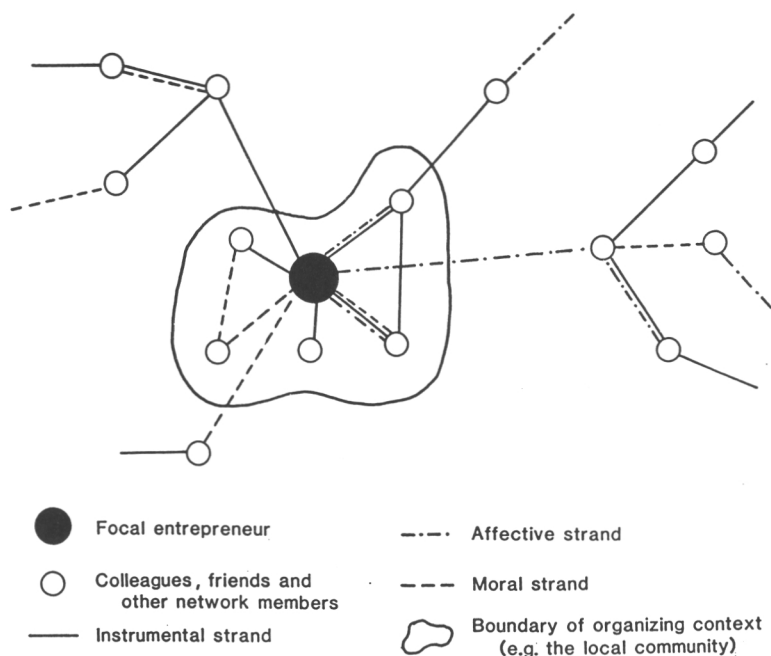


Figure 3. Personal network of an entrepreneur (Johannisson 1985b;5)

Entrepreneurs who identify themselves with the local community have no reason for holding their personal, family or social lives apart; nor are they able to (cf. Barth 1963.) "This, in combination with their insight into and overview over the local community, implies that they consider the whole local context as a resource bank" (Johannisson 1985a;14) as their task and value environment.

The personal network for an entrepreneur is not only a back-up system, with which to reduce uncertainty, but an active management tool. The personal network of an entrepreneur reflects the change capability and adoptability ie, innovativeness and flexibility of the small firm.

The accumulative nature of personal networks makes a detachment possible for the entrepreneur from the present firm or locality. The personal network is carried by the entrepreneur and the contacts are not cut even when the firm is closed. The possibility to start up a new business for a

former entrepreneur is very high on that basis. In peripheral areas the available business contacts are scarce. With an enterprising experience from another area coupled with the local moral and affective anchorage, the networking of a peripheral entrepreneur may find the benefits for his locality.

In Sweden, extensive studies have been made of the contacts between enterprises. It has been found that larger firms are more contact-intensive than smaller firms. In other words, the larger firms have more contacts with other firms even measured numerically and not by the value of transactions (Sundin 1980;135). It has been noted that firms purchase goods from firms in the same area which are of the same size-class as themselves, or then they purchase from a known large supplier irrespective of location (Sundin 1982). The purchase of one-off, specialized products is usually from producers in the purchasers own region, while standard goods which are purchased regularly are acquired via wholesale outlets with less attention to location (Sundin 1980).

The purchase of special goods from within the vicinity of the small firm may be explained by the hierarchical separation of information flows and decision making: the specification of goods required, and the follow-up of production, is easiest on the basis of personal contacts, thereby implying shorter distances. In a small firm, non-routine decisions are not separated from routine ones, while all levels of organization and all material and information flows centre on the owner-manager.

An entrepreneur is free to make the initial choice of contacts (Johannisson 1985b), but once established, the enterprise's contacts both with respect to information and material flows tends to be very stable and durable. Thus, the whole production system becomes very stable. Small firms, especially, see little reason to change their business contacts, and indeed changes are only made under duress. Local business contacts are, therefore, not maintained for merely economic considerations (Fredriksson & Lindmark

1976;305). Well established contacts are valued and maintained even at a cost (cf. Wiberg 1983), while local contacts are often maintained by habit (Sundin 1982).

4.3 Small sawmills and local development

Forestry has been considered to be capable of contributing to the economic growth and development at certain initial phases of development process of a region, to act as an export base or a leading sector at some stage. However, it has been argued that because forestry is space-using residual land use, its contributions to regional development are severely limited (Kromm 1972, cf. Gregersen 1973). In forestry generally a large share of the raw material leaves the production area and is processed elsewhere with capital intensive technology. A notable exception within the forest sector are the sawmills, where the local multiplier effects may be high. This applies to small sawmills as well as to large exporting sawmills. Despite the small amount of material flow involved, small-scale sawmilling is a significant activity locally (Fredriksson & Lindmark 1974, see also Seppälä 1976). In 1970 sawmilling sector in North Karelia one unit increase in final product demand produced a 2,1 unit increase in production (Eskelinen 1980; for further input-output studies in Finland, see eg. Eskelinen et al 1978;31-32, also eg. Saastamoinen 1985).

In a Swedish study, the spread effects to other industrial production within the immediate area around sawmills amounted to between 1,20 and 1,55 times the original increase in the production of the sawmill. There was no correlation found between the spread effects and the size of the sawmill (Fredriksson & Lindmark 1974;540-541).

Similarly, at a county level in USA, total county economic activity increased by \$2.24 for every \$1.00 of goods sold by sawmills to the outside world, ie. the sawmill sector had a total multiplier of 2.24 (Gamble 1968;464). Even on the material flow basis alone the potential of the small sawmills

for regional development would appear to be promising. The demand for the produce of sawmills seems relatively steady especially in the rural areas where wood is still the main construction and repair material.

The main resource of the small sawmills is, however, their personnel. The driving force of the small sawmill is the owner-manager. However, in every second small sawmill in the investigation there were two persons of family labour involved in sawing.

The level of general education among the owner-managers is low. This tallies quite well with the general structure of Finnish small entrepreneurs, who most commonly have little or no formal business education. However, many of the owner-managers admit to previous business experience. In the present investigation, one third of the owner-managers gave 'entrepreneur' as an occupation previous to sawmilling. When asked of their entrepreneurial experiences, one in ten sawmill owners admitted previous experience in sawmilling, and another half had experience in another sector.

Another aspect of the owner-managers, specifically in the development context are the communal and social qualities of the small sawmill owner ie. his networking abilities in the community beyond the production structure contacts.. A small, local entrepreneur is - as such - a local resource. The entrepreneur personifies the potential of social and economic development processes. By definition entrepreneurs are professional change initiators. As in figure 2, a firm operates as a part of the local and global networks, varying in the balance between these structures. Local networks require local identification, i.e. the owner-manager must identify with the local community. It requires that the physical environment is well known and interpretable for the entrepreneur. Local anchorage has been seen as an important part of a person's life necessities (Pettersson 1978;58). Local anchorage thus requires establishment in the area and an active role in the community or local matters. With the high age of the sawmills in the investigation, it may be

assumed that most of the small sawmill owners are originally from the area. However, the peripheral conditions may demand business experience to have been acquired earlier from elsewhere: knowledge imported to the periphery from the more developed areas.

For small firm, the directives are determined by one person, the owner-manager. Each owner-manager and thus each firm operates with limited knowledge (cf. Selby 1987a). Areal directions and contacts are determined and restricted by the image of the possibilities - the mental map - each individual has created over the areas. The mental map is constructed on accumulated information and influenced by the previous experience: past and present contacts and information. The shaping up of the specific features of an area - the shaping up of the areal identity - is always subjective and selective.

A local owner-manager may have a clear picture of his own local environment and of its potentials and restrictions. However, limited information and limited ability to use knowledge, in fact limits the accuracy of the entrepreneur's perceived environment for business (Selby 1986).

Entrepreneurs moving into an locality will have an even less accurate perception of the business potential of the area. Even if the production structure information is provided, the social structures of the community - the functional affective and moral bonds in the community - may remain veiled (cf. Selby 1984, 1986). Local networking is, therefore, more difficult. Entering the operating local structure may prove difficult for outsiders, and the limited local knowledge slows down or might even hinder the construction of local business delivery systems and clientele.

It has been assumed that old, well established enterprises in a locality use local information sources and deliveries rather more than incomers (cf. Fredriksson & Lindmark 1974). Especially in peripheral areas the knowledge of business contact potentials outside the immediate environment of the

firm has been proven minor (Sundin 1980;267). The mental map of the entrepreneurs is oriented towards the developed areas rather than to the more remote parts of his own region.

The entrepreneur's role in this community setting is complex: the local society needs the entrepreneur for economic and commercial reasons, the entrepreneur needs the local society for social reasons (Johannisson & Spilling 1982;224, Ek 1983;72ff). Besides being complex, the role of the entrepreneur in this setting is also delicate. He may have to adjust to the social environment: "If an entrepreneur (in a rural society) wishes to keep good neighbourly relations, he must pay 'social costs', ie. give up profit maximization, conspicuous consumption and social distance" (Barth 1963;23). If he does not conform in this way, he may be rejected from the membership of the local community. Even in other connections the common jealousy within the societies has sometimes prevented common good, rationality and effectiveness (cf. Selby 1984).

Even the small entrepreneurs function as an example of entrepreneurship in their society. The small local entrepreneur has been called a personified representative of the local self-reliance development, of the self-reliance principle (Spilling 1983). By his deeds he will thus spread confidence and action orientation. This distribution process is effectively carried out through the different social networks in which the entrepreneur participates as a community member.

REFERENCES

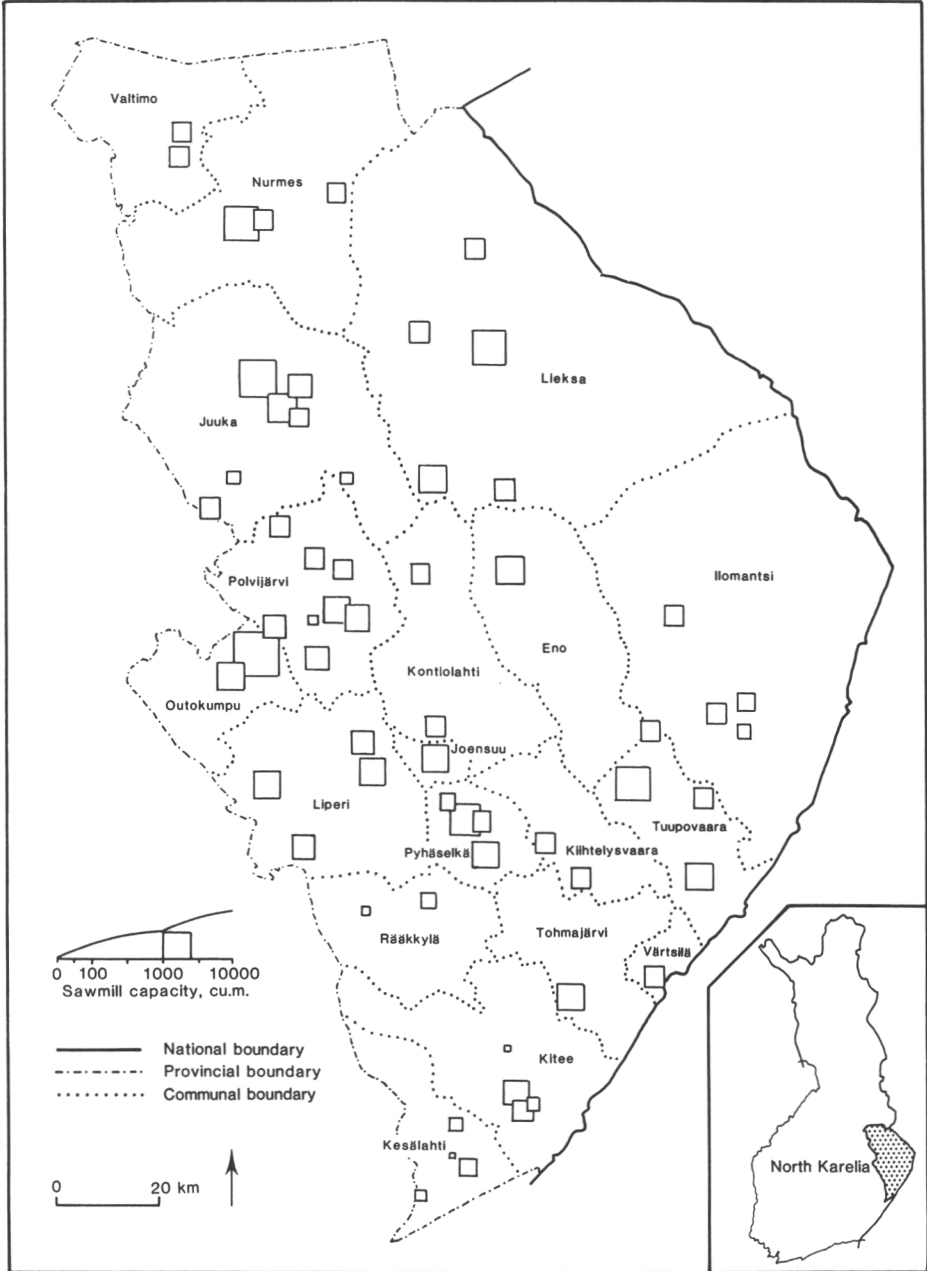
- Aho, S. 1985. A new procedure to support small-scale enterprises in a peripheral region - the case of "Lapland Extra". In: Bylund, E. & Wiberg, U. (eds.) Regional Dynamics of Socio-economic Change - the Experiences and Prospects in Sparsely Populated Areas. Arbetsrapport från CERUM, 1986:8, Umeå.
- Andersson, Å.E., Törnqvist, G., Snickars, F. & Öberg, S. 1984. Regional mångfald till rikets gagn. Stockholm.
- Barth, F. (ed.) 1963. The role of the entrepreneur in social change in Northern Norway. 1. Årsbok for Universitetet in Bergen. Humanistisk Serie 3. Bergen.
- Chans för Norrbotten. 1983. Program för CERUMs forskning om Norrbottens utvecklingsproblem. Umeå.
- Ek, I. 1983. In: Brunsson, N. & Johannisson, B. Lokal mobilisering. Om industriens kommunalpolitik och kommuners industripolitik. Karlshamn.
- Eskelinen, H. 1980. Pohjois-Karjalan panos-tuotostutkimukset 1970-luvulta. Joensuun korkeakoulu, Karjalan tutkimuslaitoksen julkaisuja 41: 1-48. Joensuu.
- Eskelinen, H., Pietiäinen, P., Pulliainen, K. & Suorsa, M. 1978. Pohjois-Karjalan aluetalouden rakenne. Vuoden 1970 panos-tuotos tutkimus. Joensuun Korkeakoulu, Karjalan tutkimuslaitoksen julkaisuja 32.
- Pietiäinen, P. & Suorsa, M. 1978. Interindustry flows for a small underdeveloped region a a small developed country: a comparative study of four methods. Joensuun Korkeakoulu, Karjalan tutkimuslaitos (unpublished mimeograph).
- Ewers, H.-J. & Wettman, R.W. 1980. Innovation-oriented regional policy. Regional Studies 14.
- Fredriksson, C. & Lindmark, L. 1974. Lokala underleveranser i Skellefteå A-region, Bilagedel II till Orter in regional samverkan. Produktionskostnader och regionala produktionssystem SOU 1974:3. Stockholm.
- 1976. Nationella och lokala produktionssystem. En strukturstudie av svenskt näringsliv. Studier i företagsekonomi. Umeå Universitet. Umeå.
- 1977. Regionalpolitisk eller regional utveckling? Några synpunkter utifrån ett Norrländskt perspektiv. Plan 6.
- 1979. From firms to systems of firms - a study of inter-regional dependencies in a dynamic society. In: Hamilton, F.E.I. & Linge, G.J.R. (eds.) Spatial Analysis, Industry and the Industrial Environment. Vol. 1 - Industrial Systems. Chichester.

- Gamble, H.B. 1968. The regional economic role of forest products industries. *Journal of Forestry* 66(6).
- Gregersen, H.M., 1973. The role of forestry in regional economic development: an alternative view. *Journal of Forestry* 71(2).
- Håkanson, L. 1979. Towards a Theory of Location and Corporate Growth. In: Hamilton, F.E.I. & Linge, G.T.R. (eds.) *Spatial analysis, Industry and the Industrial Environment*. Vol. 1 - Industrial Systems. Chichester.
- Hayter, R. & Watts, H.D. 1983. The geography of enterprise. *Progress in Geography* 7(2).
- Høsteland, S.E. & Akselsen, R.E. 1980. Skognferingen i Hedmark. *Framtida Produksjonsteknisk Forskningsinstitutt Prosjekt 5.85*. Oslo, April.
- Huttunen, T. 1974. Suomen Sahateollisuus vuonna 1972. *Folia Forestalia* 193. Helsinki.
- 1981. Suomen piensahat 1980. *Folia Forestalia* 457.
- Johannisson, B. 1978. Business and Local Community: a study in organization. Växjö University College.
- 1983a. Etablering av lokal organisation - exemplet Målerås. In Brusson, N. & Johannisson, B. (red.), *Lokal mobilisering. Om industriens kommunalpolitikk och kommuners industripolitik*. Karlshamn.
- 1983b. Swedish evidence for the potential of local entrepreneurship in regional development. *European Small Business Journal* 1(2).
- 1984. Local mobilization - ideology organization and strategy. *Högskolan i Växjö, Centrum för småföretagsutveckling. Småskrifter* 20.
- 1985a. Anarchists and organizers - entrepreneurs in a network perspective. (MS) Växjö University College.
- 1985b. Network strategies, management technology for entrepreneurship and change. Paper to "Entrepreneur 1985". Institute of Finnish Entrepreneurs, Dipoli, Finland, 11-12.11.1985.
- 1986. New venture creation - a network approach. Paper to 1986 Entrepreneurship Research Conference, Wellesley, Mass., U.S.A., 17-18.4.1986.
- & Spilling, O.R. 1982. Lokal företagsamhet och självtillit. In Spilling, O.R., *Nordisk småföretaks forskning 1982. Inlägg og referat fra 2. Nordiske Forkersseminar om småföretak*. Gausdal, Lillehammer.

- Johansen, L. 1977. Samfunnsøkonomisk lønnsomhet. Rapport nr. 1, Industriøkonomisk Institutt. Oslo.
- Kromm, D.E. 1972. Limitations on the role of forestry in regional economic development. *Journal of Forestry*, 10(1972).
- Kuitunen, J. 1983. Hyvinvoinnin alueellinen erilaistumisprosessi ja alueellinen kehittäminen. KytKentöjä hahmottava käsitteellinen tarkastelukehikko. Tampereen Yliopisto. Aluetieteen Tutkimuksia Sarja B30.
- Lasuen, J.R. 1969. On growth poles. *Urban Studies* 6(2).
- Lindström, C. 1974. Mindre och medelstor industri i förändring - en inventering av forskningen och debatten. *SIND* 2:1974, Stockholm.
- Mäkinen, V. 1976. Joustavuus pienyrityksen menestymisen edellytyksenä. *Acta Universitatis Tamperensis*, A79.
- Nenonen, T. 1982. Aluetaloustieteellisen tutkimuksen teoriaperustan ja tutkimusmenetelmien kehityksestä. *Kansantaloudellinen aikakauskirja* 2/1982.
- Oksa, J. & Rannikko, P. 1985. Kylä yhteiskunnassa. Esitelmiä Sivukasta ja Rasimäestä. Joensuun yliopisto, Karjalan tutkimuslaitoksen monisteita, 11/1985.
- Pettersson, R. 1978. Lokala och regionala spridningeffekter vid omlokalisering av statlig verksamhet. Delrapport författad inom ramen för grupparbete vid ERU. *Choros* 115.
- Ramström, D. 1974. Att studera företag och regioner. *SOU* 3/1974.
- Rothwell, R. & Zegveld, W. 1983. *Innovation and the Small Firm - Their Role in Employment and in Economic Change*. London.
- Ruuhela, R. 1972. Yrityksen kasvu ja kannattavuus. *Acta Academiae Oeconomicae Helsingiensis, Series A:8*. Helsinki.
- 1975. Yrityksen kasvu ja rahoitus. Helsingin kauppa- korkeakoulu. Oy Gaudeamus Ab. Helsinki.
- Saastamoinen, O. 1985. Panos-tuotosmenetelmä metsätoimialojen alueellisten kerronnaisvaikutusten tutkimuksessa. Teoksessa: Saastamoinen, O. & Poikojärvi, H. (toim.) *Tietojärjestelmien kehittäminen metsäalalla. Ajankohtaista tutkimuksesta. Metsän tutkimuspäivät Rovaniemellä 1985. Metsäntutkimuslaitoksen tiedonantoja* 196. Rovaniemi.
- Sahateollisuustyöryhmän muistio 1983. Kauppa- ja teollisuusministeriö. Helsinki.

- Selby, J.A. 1983. Small sawmills in rural areas of Finland. Actes du Séminaire Agriculture et Forêt. Nancy Cedex, France.
- 1984. Entrepreneurs in rural areas: a humanistic approach to the study of small sawmills in North Karelia, Finland. Metsäntutkimuslaitoksen Tiedonantoja 146. Helsinki.
 - 1985. Entrepreneurs' perceived environments and local development. In ó Cearbhaill, D. (ed.), New Approaches to the Development of Marginal Regions. Vol. 2: The Organization and development of local initiatives. Galway 1986. Proceedings of the 8th International Seminar on Marginal Regions, Galway, Ireland, 1985.
 - 1986. The perception of environmental potential by rural small-scale entrepreneurs. Paper to the Advanced Summer Institute in Umeå, Workshop IVa: Peripheral Regions. June 9-17, 1986, Umeå, Sweden.
 - 1987a. The behavioural matrix as a diagnostic tool for assisting small firms: the exploratory case of small sawmills in North Karelia, Finland. Paper to the 9th International Seminar on Marginal Regions, Skye and Lewis, Scotland, 5-12th July, 1987.
 - 1987b. On the operationalization of Pred's behavioural matrix. Geografiska Annaler, 69B:1.
- Seppälä, H. 1976. Metsäsektorin alueellinen merkitys Suomessa. Folia Forestalia 269.
- Siirilä, S. 1984. Alueellinen kehitys - hyvinvoinnin näkökulma. Terra 96:1.
- Simon, H.A. 1957. Models of Man. New York.
- Spilling, O.R. 1983. Lokalorientert småforetaksvirksomhet og regional selvutvikling. NordRefo 1983:2-3.
- Sundin, E. 1980. Foretag i perifera regioner - Fallstudier av företagartradition, företagsmiljö och företags framväxt in Norrbottens inland. Studier in Företags-ekonomi, Umeå Universitet.
- 1982. Hur uppstår småföretag? Tvärsnitt, 1982:4.
- Tamminen, R. 1981. Perustamisvaiheen pienyritystyyppit. Jyväskylän Yliopisto, Taloustieteen Laitos, Working Paper 10.
- Thorngren, B. 1970. Hur påverkar kontaktsystem den regiona utvecklingen. Bilaga 15 SOU 1970:15. Stockholm.

- Törnqvist, G. 1970. Contact systems and regional development. Lund Studies in Geograpy, Series B:35.
- 1973. Contact requirements and travel facilities - contact models of Sweden and regional development alternatives in the future. Lund Studies in Geography, B:38.
- Vanhanen, H. 1985. Small sawmills in wooded areas - a local development role? Paper to the 8th International Seminar on Marginal Regions, Galway, Ireland, 1985.
- Veggeland, N. 1977. Lokalsamfunnets utvikling under kapitalismen. Plan 6.
- Wiberg, U. 1983. Service i Glesbygd - trender och planeringmöjligheter. Umeå universitet. CERUM rapport 8.
- Virtanen, V. 1985. Vastaperustetun pienyrityksen eloonjänti/konkurssiprosessin selittäminen. Jyväskylän Yliopisto, Taloustieteen laitos, Working Paper 48.



Appendix 1. Production and location of small sawmills in North Karelia, 1982.

**METSÄNTUTKIMUSLAITOS
KANSANTALOUDELLISEN METSÄEKONOMIAN TUTKIMUSSUUNTA**

**THE FINNISH FOREST RESEARCH INSTITUTE
DIVISION OF SOCIAL ECONOMICS OF FORESTRY**

Osoite: PL 37
00381 Helsinki

Address: P.O. BOX 37
SF-00381 Helsinki
Finland

Puhelin: (90) 556 276
Telefax: (90) 506 1484
Telex: 121296 metlb sf

Phone: +358 0 556 276
Telefax: +358 0 506 1484
Telex: 121296 metlb sf

Kansantaloudellisen metsäekonomian tutkimussuunnan tehtävänä on tutkia metsätalouden ja metsäteollisuuden sekä metsien monikäytön kansantaloudellisia, kansainvälisiä ja sosiaalisia kysymyksiä. Puun käytön ja puuston poistuman arviointi sekä metsätasevertailujen tekeminen ovat tutkimussuunnan perinteisin työskä.

The aim of the Division is to investigate economic, international and social aspects of forestry, forest industries and multiple use of forests. Material and energy accounting of wood utilization as well as comparisons of timber drains and cutting potentials have traditionally formed the nucleus of the activities of this Division.

TUTKIJAT - RESEARCH STAFF

Matti Palo (professori - *professor*)

**Taloustieteelliset tutkimukset -
Economic Research**

Jari Kuuluvainen
Viljo Ovaskainen
Jorma Salo
Heikki Seppälä
Mikko Toropainen (Joensuu)

**Sosiaalitieelliset tutkimukset -
Social Research**

Pertti Elovirta
Timo Helle (Rovaniemi)
Ritva Ihalainen
Gerardo Mery
Sirpa Onttinen
Aarne Reunala (Erikoistutkija -
Research Specialist)
Ashley Selby (Erikoistutkija -
Research Specialist)
Tuija Sievänen
Heidi Vanhanen (Virkavapaa -
on Leave of Absence, 1987-89)

**Puuvaratutkimukset
Wood Resource Research**

Tapio Hankala
Harri Hänninen
Heimo Karppinen
Heikki Pajuoja
Leena Petäjistö
Yrjö Sevola (Erikoistutkija -
Research Specialist)

PALVELUT - SERVICES

Arja Honkanen (Tutkimussihteeri -
Research Secretary)
Eila Iltanen
Seppo Jolkkonen
Anna-Kaisa Korhonen
Veli Suihkonen
Jukka Uusitalo

Previous English language publications from the Division of Social Economics of Forestry in the Metsäntutkimuslaitoksen Tiedonantoja [Bulletins of the Finnish Forest Research Institute]:

- 141 J. Ashley Selby & Mikko Tervo (Eds.). Symposium on forest products and roundwood markets. 202 p. 1984.
- 146 J. Ashley Selby. Entrepreneurs in rural areas: A humanistic approach to the study of small sawmills in North Karelia, Finland. 123 p. 1984.
- 147 Vesa Kannianen & Jari Kuuluvainen. On price adjustment in the sawlog and sawnwood export markets of the Finnish sawmill industry. 32 p. 1984.
- 170 Matti Palo, Lauri Heikinheimo & Seppo Repo (Eds.). N.A. Osara - Forest Economist and Forestry Administrator. 180 p. 1984.
- 185 Jari Kuuluvainen. Short term demand for and supply of sawlogs in Finland. 132 p. 1985.
- 238 Markku Ollikainen & Hannu Salonen. The selling frequency of forest owners: a sequential binary analysis. 33 p. 1986.
- 260 Heikki Pajuoja (Ed.). Lauri Heikinheimo - Forest Economist and Research Leader. 63 p. 1987.
- 272 Matti Palo & Jyrki Salmi (Eds.). Deforestation or development in the third world. 263 p. 1987.
- 309 Matti Palo & Jyrki Salmi. Deforestation or development in the third world? Volume II. 182 p. 1988.