



Collaborative shaping of Research Agendas in WoodWisdom-net

RESEARCH AREA 4 Socio-economic aspects related to scientific innovations of wood-based materials

11/8/2005

Contents

Sub-area 4.1 Combining social and natural/engineering sciences	3
4.1.1 Economic relevance of internal labour in small scaled forestry	4
4.1.2 Improving the competitiveness of wood products with a credible substance brand	5
4.1.3 Wood and timber constructions for development and disaster areas.....	7
4.1.4 Increasing the quality of life by using new wood products	8
4.1.5 Factors influencing on perception of wood in interior use and their potential influence on human well-beeing.....	9
4.1.6 Woodwisdom-net.....	10
4.1.7 landscape and woody plants for energy.....	11
4.1.8 Conservation of painted wooden panels from European cultural heritage	12
4.1.9 Social network determinates of organizational inquiry in forestry.....	13
4.1.10 User centered design of interior wood products	14
Sub-area 4.2 Values and perception.....	15
4.2.1 Preference studies on wood products.....	16
4.2.2 Landscape effects of energy woods - conflict potentials and acceptance.....	17
4.2.3 Customer Perception of Wood or Wood based Products Surfaces.....	18
4.2.4 Leading concepts of woodland nature by different stakeholders in the EU and their social relevance.....	19
4.2.5 Urban Wilderness in Central Europe. Concepts, Projects and Perspectives.....	20
4.2.6 Measurement of biodiversity	21
4.2.7 Identifying, communicating and promoting the sustainable potentials of wood ..	22
4.2.8 Lifestyle-changes and future economic potentials for wood products	24
4.2.9 Wood products for an economic growth and climate change mitigation	25
Sub-area 4.3 New business models	26
4.3.1 New innovative business concepts for SMEs in the wood processing industry ..	27
4.3.2 Construction of multi-storey timber houses, business and process development	28
4.3.3 Innovation of the forest-based sector by integrated rural development.....	30
4.3.4 Business development and innovation through new manufacturing concepts	32
4.3.5 Strategies of forestry contractors coping with structural change.....	33
4.3.6 Developing sustainable future markets for wood	34
4.3.7 Do different Corporate Cultures in Forestry Organisations affect their function?	35
Sub-area 4.N Other.....	36
4.N.1 Flexible and automated transport and logistic of wood from forests to industry	37
4.N.2 Network for Education and sustainable development.....	38
4.N.3 Gender aspects of woodland management and forestry.....	39

Sub-area 4.1 Combining social and natural/engineering sciences

4.1.1 Economic relevance of internal labour in small scaled forestry

Positioning: Applied

Short Description: About 46% of the 10.700.000 hectares forest area in the Federal Republic of Germany is managed by private forest enterprises. One third of these enterprises are smaller than 50 hectares with characteristic small-scaled management units. The general condition for these small-scaled forest enterprises have changed fundamentally within the last two decades. The economic development is extremely difficult. The ownership structure and the objective targets of many, primarily urban forest ownerships change continuously. The owners reduce their internal labour and silvicultural activities, try to submit the management responsibility to other organizations or tend to adjust the classic management at all. These results in combination with insufficient wood harvesting technology in low profitability, the usual wood structural practices hardly anymore practicable in the future. For example the possible increase of forest utilisation by 2 m³ per hectare and year the small- scaled forestry set about 3.000.000 m³ of rough timber aside for the commercial use in the wood industry. The negative effects of this trend on the developments of rural regions be hardly to assess. Prerequisite for the development of instruments which seem suitable for the mobilization of these rough timber reserves is the knowledge about the exact business and owner structures, their dynamics as well as its inner and outer influence factors, which shall be analysed by statistical and social scientific methods.

Justification: The meaning of the cluster forest and wood in Germany is already stressed considerably in various well-known studies. Decisions affecting sustainable forest management shall be based on a differentiated knowledge of forest ownership structures, particularly its dynamics and influence factors like development, range and costs of typical equipments or the trend of internal labour workload. The relevance of the small-scaled ownerships the into cluster forest and wood doesn't fade only in Germany but also in the rest of Europe

European relevance and collaboration: Already numerous scientists and working groups have dealt with the extraordinary significance of forestry and wood industry for the development of rural regions in Europe, which are characterized by high rates of unemployment, narrow occupational bases, poor new job opportunities and rapid emigration. By foundation of an international research network the previous research results could be collected, experiences exchanged and synergy effects used. This research network is especially important for the European forestry policy priorities, which has to deal with rural development, employment and income in rural areas, increased utilisation of forest products, renewable energy and climate change aspects.

4.1.2 Improving the competitiveness of wood products with a credible substance brand

Positioning: Applied

Short Description: Although wood has been used in construction for centuries, there are still problems with the quality and usability of wood products. In many cases wood in its end use application either does not last as long as or does not look as aesthetic as it is supposed to. The visually observable problems weaken the image of wood and the competitiveness of wood products. The aim in this research is to find solutions for wood products industry to eliminate the sources of the most common problems. This is achieved by indicating the deficiencies in the wood product chain, which cause the problems in end use. The emphasis is on analyzing what the connection between the chain and the competitiveness of wood products is from the viewpoint of 1) the technical properties and usability of wood products and 2) the profitability of wood product companies, i.e. value generation in the different stages of the chain. Both qualitative and quantitative methods are applied: in-depth interviews, statistical analysis of the numerical data provided by companies, usability research and product and material testing. In this study wood product chain is perceived in a broad sense, including also such activities as architects, constructors and coating producers.

Justification: For wood to be competitive against other materials in different end use applications, one of the most important issues is to build a credible substance brand for wood. This requires collecting and evaluating research information as well as delivering the information efficiently across the actors in the wood product chain. Thorough understanding of the end use environment and the wood product chain can be utilized to improve the quality and competitiveness of wood products. Although the idea of grading the wood according to the end use seems self-evident, it does not realize in practice. The interactions in the wood product chain and the connections between technical and economic aspects are analyzed to develop a procedure for directing the wood material to different wood products and wood products to different end uses correctly. This would yield in improved competitiveness of the wood products industry as whole and better profitability of the individual wood product companies. Higher-quality products, in their turn, yield in a more sustainable living environment. The key quality issue is to develop more durable wood products, which in its turn have positive environmental impacts in the form of longer product life cycle and easily and safely disposable products.

European relevance and collaboration: Understanding the end use environments in different countries is extremely important, because there are great differences between different wood species and the quality and types of wood products across Europe. Combining studies in Finland and Central European countries provide a broad view and the results can be generalized to other areas, such as Russia, too. Other European research groups working with similar aspects of the use of wood include the Technical University of Munich and the University of Hamburg. The first investigates durability problems of wood products, such as blue stain, from the perspective of building physics. The latter carries out biological research of wood material. Both support the proposed research

Collaborative shaping of Research Agendas in WoodWisdom-net
RESEARCH AREA 4: Solicited issues

theme well. In Otaniemi, Finland, there is a large knowledge reservoir combining expertise from the areas of wood technology, architecture and building physics. The group consists of different university laboratories and the Technical Research Centre of Finland.

4.1.3 Wood and timber constructions for development and disaster areas

Positioning: Applied

Short Description: Development of houses and housing units based on wood/timber constructions and wood-based materials (panels, flooring, insulation) for disaster and development areas, which are pre-fabricable, need a few transportation space, are easy to assemble and dismountable; self-sufficient with regard to energy and conditioning, offer multifunctional applications such for housings, hospitals, administrations.

Justification: Business goals is the increase of wood sales from EU producers (saw mills, houses, wood based products; Connections of opening a new market for wood products with social and humanitarian engagement of the EU and support to both disaster and war areas and development areas. R&D in this field will increase the use of wood as a renewable material for new applications and value-added products. Additional effects: development of new assembly systems; creation of "intelligent" houses and modular housing units, reduction of waste material to "0"

European relevance and collaboration: Comprehension of woodworking industry, construction specialists. In result of the project in the participating countries different solution concepts may be developed, such as different solutions for various demands and applications, e.g. for different climate conditions.

4.1.4 Increasing the quality of life by using new wood products

Positioning: Applied

Short Description: Increasing the quality of life is a pan-European challenge; leads to an improvement of the image of wood and paper products; Intelligent connections for wood and paper products within the living environment; variable flat and building systems (i.e. variable number of rooms and room size):Targets are : multi-purpose intelligent and healthy and environmental friendly solutions (e.g. furniture, interiors) for all living ages; concepts for flats with removable inner walls.

Justification: The ageing of the population is, as far as permanent and global nature of the problem is concerned, a pan-European challenge for science, politics and social work. Predictions assume that by 2010 appr. 25 % of the European population will belong to the category of old people. These have special needs to their living environment. There are a lot of products from wood and paper industry around people in their living environment e.g. construction materials for cladding, flooring, interiors, furniture such as for wellness and hygienic applications. The research area includes facts like individuality, barrier-free living, ergonomics, communication, reduction of harmful substances, mobility, safety, intelligent linkage of products, connected with an increase of the sale and use of wood and paper products, based on renewable resources. In the living (private) environment products from both wood and paper industry meets at the customers direct environment. Improvements will have a strong effect on their health, well-being and ability. Business goals are: increasing of wood and paper product sells; development of solutions based on products for constructions, interiors, furniture, wellness and hygienic applications; use of healthy and environmental friendly material and coatings.

European relevance and collaboration: Increasing the quality of life by use of new wood and paper products for accommodation: after studies on life types (domiciles, interiors, furniture)in EU member states (the different and typical requirements are compiled. This is basis for development of new wood and paper based products which leads in turn to an increased quality of life. Key research groups: social research, futurology, wood and paper related research

4.1.5 Factors influencing on perception of wood in interior use and their potential influence on human well-being

Positioning: Basic

Short Description: The objective is to research the factors of attractiveness of various wooden surfaces and peoples' preferences in different european cultural surroundings. The study should be made in comparison to certain substituting materials and the influence of mode or traditions should be separated from attractiveness factors.

Justification: Goals are: - to test survey methods - to build a common knowledge base for product & marketing development - to build scientific basis to better understand consumer behaviour - to evaluate the efficiency of marketing and trade in different areas - to develop understanding what does it mean to human person if he/she lives in "attractive surrounding"

European relevance and collaboration: The study should be made among 4-5 different countries in Europe and this leads to network structure.

4.1.6 Woodwisdom-net

Positioning: Basic

Short Description: To aim for a sustainable wood production in Europe, related technical, ecological, economic and social aspects have to be integrated. Ecological criteria are effectively and efficiently covered in a life cycle perspective, applying the proven method of LCA. With an LCA, global, regional and local impacts on the environment can be analysed. But social criteria are derived from either conditions stipulated by law, regulations/conventions, or by the direct consequences of a decision, which could affect an individual or the society in general. For example, in changing a harvesting procedure or the kind of grown wood job profiles can change and jobs can be created or eliminated. In the wood production e.g. the question of accidents is very relevant as the wood production has one of the highest rates of accidents per Euro of created added value. However so far there is no agreed method to assess these social effects. Therefore the relevance of different social indicators should be examined with regard to the requirements and particularities of the wood industry and the necessity of further indicators should be identified.

Justification: For the use and production of wood the social dimension will play a major role, as the agricultural production is rather labour-intensive and creation of additional jobs – especially in rural areas – can be shown using this method. It can be used to evaluate certain social impacts under a life cycle perspective and demonstrate how the gained knowledge can be used for decision support, by fostering the sustainability approach. For consideration of the social effects related to the production of wood a life cycle based approach is needed for the same reasons as in the ecological field: • to avoid shifting of social problems from one life cycle phase to another and • to locate “hot spots” where it is most pressing to change something. • to avoid shifting from the environmental realm to the social field As supplement of the classical Life Cycle Assessment (LCA)-approach the social aspects of the wood production so far have not been thoroughly assessed concerning their potential integration.

European relevance and collaboration: Social assessment includes employment, working conditions and qualifications as well as health and safety aspects. These issues are important to ensure safe and healthy work places for European citizens in the future. The wood industry – not only in Europe – did/does have some serious challenges, especially regarding accidents. However, from a European perspective it is not enough to only consider these single numbers, but an improvement should on the other hand side not cause any impairment in another field of social, environmental or economic measures. This is also in Line with the aim of the EU to promote corporate social responsibility (CSR). Therefore a holistic approach dealing with all of the mentioned aspects in the different European countries is needed. Possible Research Groups are: • National Board of Forestry, Sweden • University of Stuttgart, IKP, Dept. Life Cycle Engineering • Finnish Forest Industries Federation • Timber Trade Federation (TTF)

4.1.7 landscape and woody plants for energy

Positioning: Applied

Short Description: Increasing area of abandoned agricultural land with natural succession of woody plants changes dramatically the scenery of landscapes and nature protection values. Public perception of these changes is negative but public funding to maintain the character of the landscape is likely to diminish. Using the natural regeneration of woody plants on those areas, combined with partially enriched plantings, to produce materials for bioenergy in short rotation could essentially contribute to keep the patchiness of the landscape and at the same time to provide a valuable product. Natural succession composition, harvesting techniques, population of rare species, but also socio-economic effects such as income to local people and public perception of the landscape has to be studied on test sites on a European scale.

Justification: The results and innovative techniques will possibly enable a balanced and cost-efficient landscaping in a multifunctional way. At the same time local bioenergy factories can be based on an extended supply of a scarce resource and income for employers will be generated along the production chain to counteract the loss of population in rural areas. Also the impacts on the environment are predominantly positive. As the effectiveness and utility of using abandoned agricultural land for woody energy plants are very much site dependent and at the same time directly determined by the socio-economic and legal frame a broad variety of situations throughout Europe have to be taken into account.

European relevance and collaboration: The demand for energy and the use of woody biomass for energy will most probably increase throughout Europe. At the same time landscape protection is an important issue emerging in many European countries. There are many research groups in Europe working on different ends of the problem (bioenergy, energy plantations, harvesting technique, landscape management, rare species protection, economic situation and rural development etc.). What is needed is a cooperative effort to bring these ends together for an integrated, transdisciplinary approach.

4.1.8 Conservation of painted wooden panels from European cultural heritage

Positioning: Applied

Short Description: Artistic paintings performed on wooden support require special care because of the effect of hygrothermal conditions of the movement of the wooden substrate and resulting deformation of the paint layer. Inappropriate conservation techniques of the 19th century followed by the wide-spread of temperature control in buildings in the last decades have often resulted in dramatic damage. The wood-workers and cultural staff involved in conservation operations are in high demand of technical help from wood scientists to rationalize their decision regarding modification of frames, or condition for allowing movement of paintings or public access. A multidisciplinary approach is required to address this type of problem: structural mechanics of the wooden support, physico-chemical analysis of the paint layer, conservation issues. The projects consider the development of numerical tools based on simplified finite-element analysis of the hygrothermomechanical behaviour of asymmetrically painted wooden panels. Validation can be done through non-destructive observations of real paintings and more extensive experimentation of imitations.

Justification: The considerable added value of this type of wooden products motivates a considerable scientific input taking advantage of the latest advances in the field of wood mechanics, especially the hygromechanical couplings, ageing processes, crack propagations analysis. The benefit for wood scientists lies in the prestige often associated with the handling of such problems, but also in the increased knowledge on the long-term behaviour of wooden structures that can result from such studies.

European relevance and collaboration: The issue concerns major European museums and organisations responsible for the conservations of historical buildings, where wooden painting can be found. Often the research is performed locally but would benefit from co-operation of involved laboratories.

4.1.9 Social network determinates of organizational inquiry in forestry

Positioning: Basic

Short Description: This research issue considers how different features of informal organizational structures affect organizational learning in forest industry organizations. By using social network analysis and an organizational learning inventory instrument, we investigate relational and formal characteristics that facilitate knowledge utilization in forest industry organizations. The research is dedicated to helping forestry organizations improve performance through better knowledge transfer and enhanced learning processes. The analytical model in this research will relate organizational learning and social network characteristics. Data on social network information and organizational learning will be collected in case studies through surveys and interviews.

Justification: Increasing market globalization, the complexity of linked economic relationship structures and modern information and communication technologies have led to radical changes in many sectors of business and social life. Knowledge is increasingly becoming recognized as a critical resource in many fields of endeavours, yet its importance in the forest sector is undervalued. The forestry industry is subject to changes from many different sources, which are characterized by an increased mechanization and capitalization, and the increasing pressure of competition through internationalization and globalization. This leads to the requirement for improved productivity. One important step in this direction is to focus on knowledge utilization and learning in forestry organizations.

European relevance and collaboration: Work environments of the 21st Century place people in an information-rich world. New technologies and new information come to people every day. Organizations and their members need to deal with the changing environment in order to live well in the world. The research programme sets out to develop a Europe of knowledge and thus better cater for the major challenges of this new century.

4.1.10 User centered design of interior wood products

Positioning: Applied

Short Description: Project aims at identifying: a) information needs related to designing and deciding about interior wood products b) decision making and material acquisition practices c) preferences concerning such products. Research methods: survey and interview based documentation of design and decisionmaking practices and participatory design sessio. Carried out in three european areas: Scandinavia, eastern and western central Europe.

Justification: Results: requirements for interior wood product design, product and customer needs information and new delivery channels Information can be used as basis for implementing new design practises into the wood industry.

European relevance and collaboration: As the end-product markets of interior products are global should the information be gathered within different European market areas. Marketing, design and social sciences orientated research groups could have a key role in the implementation.

Sub-area 4.2 Values and perception

4.2.1 Preference studies on wood products

Positioning: Applied

Short Description: It is to see which factors influence peoples preferences and appreciations of wood products. It include sensory and aesthetical aspects, but also preferences with regard to origin, service, env. labeling. The approach involves using accepted methods from marketing and from the psychological and behavioural sciences. The correct methodological approach should be emphasized Data could be collected through surveys and panel studies etc. It would be an advantage to conduct international comparative studies.

Justification: It would assist in implementing a greater conciousness about the final consumer in the otherwise too "production-oriented" European wood industry. The results could be used indirectly in product development. In some case maybe even directly. Development of methods for consumer-led product-development.

European relevance and collaboration: The problem of marketing of wood products and communication with consumers is a common European issues. Europe's wood industry (including building sector) is also an important exporting sector. The European scope would facilitate international comparative studies and enhance the methodological relevance of the study by involving research parties with complementary and specialist knowledge.

4.2.2 Landscape effects of energy woods - conflict potentials and acceptance

Positioning: Basic

Short Description: Expanding the production of energy wood may impact to a greater or lesser extent on the cultural landscape. The shape of the landscape varies depending on the production system, the (spatial) dispersion of energy woods, and their integration into the greater landscape; say on the production management. However, the public's perceptions of the newly composed shape of the landscape will decide on whether the expansion of energy wood production gains the acceptance of the public or not. Landscape changes implicate conflict potentials that may lead to considerable economic costs if appropriate conflict resolution strategies are not successfully implemented. Hence, research is needed in order to find forms of energy production which gain the acceptance of stakeholder and other affected groups and minimise economic conflict costs. The scenario method is an appropriate instrument to display future shapes of the landscape and to provide a basis for decision-making. Based on an acceptance analysis perceptions and the public acceptance of energy wood production and its impact on the shape of the landscape can be revealed. These research methods are particularly qualified to be employed in an international context as differences in perceptions and acceptance between several countries can be elaborated.

Justification: One of the main targets of the EU's energy policy is to increase the share of the renewable energy sources to 12% by 2010. In order to successfully embark on this strategy research is needed not only on technical innovations, but also on the human and societal dimension. The proposed research topic reveals preferences of the public what kinds of landscapes are preferred and how energy woods may be integrated in a societal appreciated shape of the landscape. This knowledge provides the basis for further research activities as well as for product development in order to implement appropriate management strategies for energy wood production and product innovation.

European relevance and collaboration: Perceptions of energy wood – like of all management measures – differ between countries because of cultural differences and institutional weighting of wood policies. The experiences of different European countries can build the starting point for future strategies of increasing the acceptance of energy wood production. Research is engaged in analysing perceptions and appreciations of nature by the public and different stakeholder groups. While the scenario method is applied to a certain degree in landscape research, to our knowledge there do not yet exist any studies on the perception and acceptance of energy wood and biomass production. The innovative approach of the proposed topic is the combination of an instrument of strategic planning with empirical social research. Research can be based on conducted acceptance analyses of nature conservation strategies and recent projects on sustainable impact assessment of different land-use forms and policies which are financed by the EU 6th framework programme.

4.2.3 Customer Perception of Wood or Wood based Products Surfaces

Positioning: Applied

Short Description: Marketing strategies will more often direct appeal to human senses. Therefore it is necessary to know, what customers perceive or feel, when they get in contact with wood or wood based materials. Up to now, many factors in this perception process are not researched. So the effects of the material on the receptors of the different senses should be examined in field research or in laboratory situations.

Justification: We assume, that customer's perception is different in the various culture areas in Europe. Innovation processes and new product developments in the industry could better meet the requirements and perceptions of the customers. The better understanding of customers feelings and needs create a competitive advantage in the markets. The fit of wood products to the articulated or unconscious needs of customers creates a value added for both partners in the buying process. So the results of this research could improve product developments and marketing strategies with better information for market segmentations.

European relevance and collaboration: As we assume, that the perception of customers is different culture areas in Europe, the determination of the shared and divided preferences of various culture areas could be done best with the knowledge of local habits and requirements in the surrounding of the research. So a network of local partners would be the ideal form of organisation. Research groups in the fields of market research, psychophysics and surfaces of wood and wood based products could play a key role in this research.

4.2.4 Leading concepts of woodland nature by different stakeholders in the EU and their social relevance

Positioning: Basic

Short Description: Up to now the relation between the (scientific and public) perception and understanding of woodland nature on one hand and forestry or woodland management on the other hand is not understood. Due to differences in cultural meaning of woodlands and tradition in forestry a broad range of leading concepts is to be assumed at different actors and stakeholders in the various European nations. Needed is (especially) qualitative empirical data on various EU nations (comparison studies) but also on common interests and differences in nature relation, i.e. perception, reflection and understanding of wood natures, the herein hidden normative and social relevant implications and their influence on managing concepts and their acceptance.

Justification: To detect the included social concepts and values in woodland management concepts of stakeholders will offer new perspectives on arrangements for public participation and discourse on woodlands management concepts, on the understanding of the function and connection between social and natural aspects and therefore on the possibilities for changing the relation between nature and society.

European relevance and collaboration: The sustainable management of natural resources is not ending at national borders. Basic knowledge about social conditions for acceptance, ignorance or refusal of management concepts is needed in all European countries and should be analysed on developmental possibilities for common strategies to change the attitude to woodlands in cooperation with stakeholders due to the sustainable development approach.

4.2.5 Urban Wilderness in Central Europe. Concepts, Projects and Perspectives

Positioning: Applied

Short Description: Focal question: Contribution of the wilderness approach to urban woodlands to public perception/Understanding of nature and acceptance of wilderness, to support biodiversity and ecological performance of woodlands and to create a new professional habitus of foresters or wilderness managers. State of the art: National efforts to "create" or allow wilderness in urban / suburban woods. Impact on forestry, economic and working situation (change in staff, in professional skills, in economic demands and success). Socioeconomic analyses and analysis of ecological performance (biodiversity,ecosystemic parameteres)

Justification: Results will show the actual situation in Europe (description of the present urban woodland wilderness, of the cultural conditions and backgrounds leading to the performance, public understanding and social acceptance of such areas...); results will show, wether urban woodland wilderness could serve as spezific nearby recreation regions in the understanding of "wilderness learning centres" and their sustainable economical, social and ecological utilization.

European relevance and collaboration: The wilderness understanding and the amount of wilderness regions in Eurpe are different due to geographical conditions and population density. It should be interesting to get an idea of europeanwide urban wilderness amounts, the national specifities and the possibilities of mutual benefitting from experiences.

4.2.6 Measurement of biodiversity

Positioning: Basic

Short Description: Biodiversity is a central concept when use of forests is discussed. However, the concept is only vaguely defined and this may lead to major misunderstanding. Biodiversity is a multifaceted concept (genetic/species/ biotypes; geographical scale; in relation to "natural state") and thus quantifying it with small set of characteristics is not plausible. The concept should be analyzed from measurement information theory point of view where entropy is a measure of disorder/diversity. This research would consist of conceptual analysis and systematic development of measuring methods for finer aspects of biodiversity. One basis for measurements are digital images (not in genetic biodiversity).

Justification: This research would explicate the concept of biodiversity for stronger basis of political discussions. The aspects of biodiversity made measurable would systemize the analysis of the impacts of actions (political, industrial, technological) on biodiversity.

European relevance and collaboration: The concept of biodiversity has different aspects in different environments and thus a pan-European approach is a necessity. The research consortium needs to have groups with backgrounds in biology, information theory and measurement technology.

4.2.7 Identifying, communicating and promoting the sustainable potentials of wood

Positioning: Applied

Short Description: Wood has always been in focus during political discussions on “Sustainable Development“. This product group offers many advantages concerning environmental, economic and social aspects. Nonetheless, at present, only specific products are assessed regarding their environmental impact. The complete picture is missing. An assessment to identify and communicate the possible environmental advantages and potentials of wooden products and their economic and social impacts has to be carried out Europe-wide and on a scientific and reliable basis. Initially a market analysis of wood products and their corresponding material flows must be carried out to identify application fields and quantify relevant flows and products. The most important competing products need to be characterized and evaluated regarding their relevance. In order to assess strengths and weaknesses of the relevant products and their competitors, a characterization of their technological and economic criteria will be the next step. Only then can the respective ecological performance analysis be conducted in a purposive way since only then will it be representative, close-to-reality and relevant. This leads to final guidelines addressing the relevant products and not niche products. A subsequent detailed analysis of selected wood products will present optimization potentials over the life cycle of the products.

Justification: This project combines and evaluates knowledge of the different disciplines of wood products and their competitors (economy, technology, environment and social aspects). This enables the channelled promotion of wood products to areas where they are of high importance for sustainable development and where the benefits in sustainability are greatest due to their relevant market volumes. Aim is to assess the sustainable market potentials resulting from a shift from non-wooden products to wooden products and from the increase in demand for wood products. It will deliver guidelines for companies active in the wood product market or other (political) actors interested in market potentials. The study supplies the most important arguments for a target group oriented communication. The holistic approach of determining environmental as well as socio-economic impacts over the life cycle, allows the realisation of product-specific information for each individual product. A comparison with other products with the same function provides arguments for advantages and disadvantages and identifies optimisation potentials. This research approach is only possible with an integrated co-operation between science and economics/industry. With the early involvement of partners from industry, trade and politics and the subsequent guaranteed expansion of the project results, the sustainability of this approach is ensured.

European relevance and collaboration: EU-wide a multitude of different environmentally political frameworks, promotion concepts and incentive programmes on national levels do exist. In most cases, little is known about the interaction with other environmental policy objectives. Objective information regarding potentials towards sustainability in relation to the respective market is not only in demand in Germany,

Collaborative shaping of Research Agendas in WoodWisdom-net
RESEARCH AREA 4: Solicited issues

where a project is currently underway, but is also creating great interest in the rest of Europe. It appears necessary, to carry out similar studies in other EU-countries since the market shares and volumes of wood products differ significantly between them. The study enables future activities to be focused on areas with high sustainability potential. Within this study, the results of the COST E9 "LCA on Forestry and Forest Products" will be referred to, through which a scientific platform on sustainability questions along the forest-wood chain is already available and partners play a key role in this work again.

4.2.8 Lifestyle-changes and future economic potentials for wood products

Positioning: Applied

Short Description: The differentiation und pluralization of lifestyles has resulted in a highly differentiated market for nearly all consumer products. Marketing studies show that changes in lifestyle will have far reaching consequences for housing and furniture demands and accordingly for the demands for timber and high class wood for furniture and other products. This is even true for the demand for firewood and wood products for energetic use. Furthermore, it is to be expected that the acceptance of new wood products strongly depends on lifestyle. Thus, for reliable prognosis for the future wood market a detailed analysis of attitudes and preferences of the different lifestyle groups and their future development should be made. For such an analysis the Sinus milieus could act as a suitable basis, since they take into account all dimensions of the social situation as well as value orientation, lifestyle, and aesthetic preferences, have been used in many marketing studies, and are used in a current study within the German Sustainable Forestry-Research Program. A suitable method to determine attitudes relating to wood and wood products are milieu specific focus groups.

Justification: The aim of the proposal is a prognosis of the future development of lifestyles and the consequences for the demands for wood products that at least in the private household sector strongly depend on lifestyle patterns. The study thus would give valuable information for the development of wood products and their economic potentials.

European relevance and collaboration: The wood market to a large extend is a transnational market. The processes of the differentiation und pluralization of lifestyles can be observed in all European countries with strong common trends but also with developments, that are specific for individual countries. The Sinus milieus are available for several European countries. In addition, there is a supranational Everyday Life Model ("Meta Milieus") available both for Western Europe (Austria, Belgium, France, Germany, Great Britain, Italy, Luxembourg, The Netherlands, Spain, Sweden) and for Central / Eastern Europe (Bulgaria, Croatia, Czech Republic, Hungary, Poland, Slovakia, Slovenia) which is based on empirically validated national Lifestyle Models. European research groups that could have a key role in the implementation of this research are: Sinus Sociovision (based in Paris (F) and Heidelberg (D)), ECOLOG-Institute for social-ecological research (based in Hannover (D)); studies on milieu-specific consumption patterns and communication strategies).

4.2.9 Wood products for an economic growth and climate change mitigation

Positioning: Applied

Short Description: Carbon fluxes in the forest sector can be influenced directly by carbon stock changes in forests or forest products, and by substituting bioenergy for fossil fuels. They can be influenced indirectly by using wood products in place of more greenhouse gas intensive materials and products, such as steel, aluminium, concrete, etc. The aim of the research is to establish the importance of wood as a substitute for other resources to mitigate climate change and to increase economic growth, and to understand the implications of such substitution by integrating engineering, natural and social science perspectives on the subject.

Justification: The wood substitution allows for a viable transition towards a society that is less dependent on energy and material resources that cause higher greenhouse gas emissions. Such a transition will improve the competitiveness of forestry industries and improve the market conditions for wood-based products. However, analysis of wood substitution is a very complex issue, since the underlying system is complex. The influencing factors can be found along the entire wood chain; they include several industries, socio-economic and cultural aspects, traditions, cost dynamics, technical and structural change etc. Research in this field is also still quite limited. Furthermore, the prerequisites for wood and biofuel substitution are also affected by climate change. Hence, we have to improve our knowledge about how to consider effects of climate change in forest management practices.

European relevance and collaboration: A viable transition towards a society that is less dependent on energy and material resources that cause higher greenhouse gas emissions is of general importance of Europe. Fruitful research in this area requires cooperation among several research groups in Europe. Here, only a few examples of groups are listed. Department of Ecology and Natural Resource Management, Agricultural University Norway; Finnish Forest Research Institute, Finland; Institute of Energy Research, Joanneum Research, Austria Utrecht University - Copernicus Institute for Sustainable Development and Innovation - Utrecht, The Netherlands

Sub-area 4.3 New business models

4.3.1 New innovative business concepts for SMEs in the wood processing industry

Positioning: Applied

Short Description: The main aim of this is to strengthen the business concepts of SMES in the wood working industry. The basis for this area are R&D oriented concepts that will be developed e.g. from research projects (spin-offs).

Justification: New business concepts, better knowledge/information platform in SMEs

European relevance and collaboration: Information exchange / export oriented business

4.3.2 Construction of multi-storey timber houses, business and process development

Positioning: Applied

Short Description: The goal of the research project is to develop models and methods to strengthen the business- and process development in the industrialised building of multi-storey wood houses, as well as methods to ensure continuous learning from project to project. The following research questions will be answered: How can coordination between the wood component and building industry be achieved so resource-limiting method development take place? What demands do economically stable business models place on suppliers? How can methods documenting the experiences of demonstration building be developed further to increase learning? The theoretical focus on business and process development and learning between projects makes the efforts of research interdisciplinary where the object of research (the demonstration project) provides a focal point for theory building regarding the integration of technology, market and organisational development. From our point of view the concept of business- and process development is the bridge between timber frame/construction technology and market. Business development is studied in terms of “the value constellation”. Our view of development is influenced by “lean thinking” – a resource-limiting philosophy. Research to develop the above methods and models is built on the “multiple case” methodology in the form of demonstration projects, i.e. real construction projects.

Justification: A concept for multi-storey construction of timber frame houses is by VINNOVA pin-pointed as important to achieve a wood-products innovation system. Development of industrialised (lean construction) systems will act as a catalyst to achieve cost effectiveness and sustainability, generally speaking, in construction. However, house building activities, requires the integration of all elements and components of a building and actors/members in the supply chain i.e., the developer, the builder, the contractors and the timber frame suppliers. The research will focus on finding and adapting methods to apply and integrate supply-chain control and lean construction to the building and wood industries. Distinct advantages of a industrialised multi-storey housing concept to achieve better economics, business economics and environmental impacts are: Timber frame construction is cost effective and a systematic development can help to decrease the building costs further; timber has excellent prefabrication qualities making prefab. systems easily manufactured with a higher control (moisture, tolerances, transportation) than any other building material; practical experiences indicate that the working environment is increased for timber frame construction (i.e., the conditions are improved for the construction personnel); a lean philosophy is elsewhere shown to be a tool to achieve efficient process and production innovation processes.

European relevance and collaboration: During the 60s and 70s, the production-focused and non-customer oriented systems building approach was developed and used in European countries like Sweden and Great Britain.. However this form of industrialisation was not successful from a socio-economics perspective. The whole European house building sector is affected by the present debate around economic,

environmental and social sustainability in the society and is discussing and evaluating technological changes in supply and production methods. The solid wood value chain is a large supplier of products and services for the European construction industry, approximately 70 % of total sawn timber production are used for constructional purposes. The European house building sector produces about 1.7 million apartments per annum. Successful implementation of new innovations (i.e. multi-storey timber frame housing) depends on factors which are often nationally or regionally defined why an European perspective and involvement is crucial.

4.3.3 Innovation of the forest-based sector by integrated rural development

Positioning: Applied

Short Description: Integrated cross-sector development is the major strategy for rural areas in Europe. The basic idea is that all sectors cooperate closely together in developing the region. The cooperation is done by joint cross-sector programs, new cross-sector institutions comprising state and private institutions and civil society and integrated financial support. New governance instruments are used to integrate stake holders from different sectors and different levels. The expectation is that integrated development will foster additional innovation which cannot be developed by a insulated sector. The research theme is whether and how integrated rural development can foster the transition into a sustainable market and a knowledge driven forest-based sector: - Scenarios of the short and long term, linkages and contributions of the forest-based sector to different types of rural areas - Cross-sector potentials of the forest-based value chains - Options for an active role of the forest-based sector within rural governance - Multi-level political strategies for fostering forest innovation by partnerships of stakeholders from private, state and civil society within integrated rural development Methods of research: 1. Basic analysis and scenarios: - National case studies in the potential for innovation of the forest-based sector by integrated rural development - European wide comparative studies in the potential for innovation of the forest-based sector by integrated rural development 2. Pilot projects in implementation - Joint development and implementation of national strategies for the forest-based sector within rural development - Joint development and implementation of international strategies for the forest-based sector within rural development 3 Evaluation reports of the progress of the forest-based sector within rural development - Scientific evaluation reports - Communication with the national and international stake holders of the forest-based sector and rural development

Justification: Integrated rural development is a most promising strategy to strengthen the contribution of the forest-based sector for consumers as well as for society, environment and energy demands. The cross-sector integration is aimed to open additional potentials for the competitiveness of the sector. Enhanced cross-sector cooperation with all stake holders in rural areas will improve the locations for all business activities of the forest-based sector where it is most important, namely, in rural areas Bringing the development strategies for rural areas and for the forest-based sector together will create a reasonable potential to improve the economic and ecological situation in rural areas throughout Europe. The project contributes strongly to the priority of the EU to develop rural areas.

European relevance and collaboration: Integrated rural development is an important issue for most European countries. Nevertheless the concepts are highly divers and the potential to learn from other countries is very high. Additionally integrated rural development is a priority strategy of the European Union and needs a common concept which can only be developed by a joint research effort. A key role in the research could have the group “Integrated Regional Development” at the University of Göttingen

Collaborative shaping of Research Agendas in WoodWisdom-net
RESEARCH AREA 4: Solicited issues

(www.modellregionen.de) (2005-2006) and the international group of the European Union (STREP): New Modes of Governance for Sustainable Forestry in Europe (2005-2007).

4.3.4 Business development and innovation through new manufacturing concepts

Positioning: Applied

Short Description: Dynamic and flexible responsiveness to new market needs, ability to introduce and implement innovations quickly will be key success factors in the competition between different industries. This needs to be a design criterion for future manufacturing concepts. The EU is today the global technology leader throughout the fibre based value chains but the existing technology has definite handicaps. The pulp, paper and converting value chain is very capital intensive. The present technologies have lead to very large production unit sizes. New machines tend to operate within a very narrow window with little flexibility to produce different grades or to take advantage of market swings or emerging technologies. The result is a value chain that is inflexible, causes long transportation distances and warehousing between processing stages. This increases investment and manufacturing costs and risk in exploiting emerging technologies. New production concepts that facilitate introduction of new technologies and enhance/support product and process innovations are needed. Also smart logistics systems are needed to counteract the negative environmental and economic impacts of transportation.

Justification: Paradigm for high integrated development and production networks (enlarged value-chain integration, local industry network concepts, life-cycle and overall efficiency assessment, data-networking..) Adapted and optimised scale of production units (degree of integration of production processes, decreasing specific capital intensity, adaptation to material supply and consumer needs, transport ..) Flexibility and modularity of production units (operating window, time-to-market, efficiency) Simplification of units and stability of processes (on-site-additive production, maintenance, man-machine-interface)

European relevance and collaboration:

4.3.5 Strategies of forestry contractors coping with structural change

Positioning: Applied

Short Description: The overall research objective of this project is the development and implementation of new business models for forestry contractors in European countries for the reason of competence development to improve entrepreneur's competitiveness in the forestry-wood-chain. Forestry contractors need competences to meet the actual requirements on work performance and business development. Competence development will improve the competitiveness of forestry contractors to cope with current problems. This leads to the following objectives: (1) Forestry contractors will cope with competence development through new business models. (2) The share of SMEs in the added value on the forestry-wood-chain has to increase. (3) Factors, contributing to the improvement of the market position and economic integration of SMEs will be identified. (4) The attractiveness of the job needs improvement. Projects need to be based on a participative research approach. Forestry entrepreneurs will be partner in this project to ensure valid development and evaluation. It guarantees access to active SMEs in the forestry sector in the different regions, problems are detected and reported from bottom to the scientific level and during piloting innovative business models results can be discussed immediately.

Justification: Knowing that the phenomenon of continuous changes and the need to cope with new situations in a best possible way, SMEs have to find solutions to meet these new demands and challenges. Therefore the approach of new business models needs to be successfully developed and introduced in forestry harvesting and logging SMEs. New business model is the innovative mechanism by which a business intends to generate better value or revenue and increase their profits in a social and sustainable way and at the same time a tool for competence development. It is a summary of how an enterprise plans to serve its customers, namely forest owners and fortified wood processing industries. Such new innovative business models will be developed, piloted and evaluated within this project. It involves both strategy and implementation.

European relevance and collaboration: The Ministerial Conferences on the Protection of Forests in Europe (MCPFE), starting in the 1990s in Strasbourg and its follow-up conferences in Helsinki, Lisbon and Warsaw highlighted the need to manage forests in an ecological, economical and social way. Therefore, forestry needs competent and viable work. Trends in Europe show an ongoing shift towards forestry contractors carrying out the work during the last two or three decades. In many countries throughout Europe the forestry sector has been moving backwards in terms of skill levels, work safety and health, working conditions and work quality. Lack of qualified entrepreneurs and workforce might be the most crucial barrier for competitiveness of forestry and forestry based industries in Europe. Research groups from all European countries should participate in order to collect various samples for benchmarking and to transfer experiences and results to other countries.

4.3.6 Developing sustainable future markets for wood

Positioning: Applied

Short Description: The main objective of this research activity is the identification and development of sustainable future markets for wood in Europe. Suggested approaches to exploit market innovations are network cooperation and customer integration concepts. These approaches will eventually enable the European forest and wood industry to enter sustainable future markets and drive business towards higher competitiveness in the international markets.

Justification: The European forest and wood industry is situated in an economic crisis which demands structural change and innovative approaches for sustainable development. Side effects are the difficult profit situation for small and medium companies but also their need to increase the efficiency within the forestry-wood-chain. The need to identify and explore future markets as well as to comply with sustainability standards in the product chains earmark the current business situation. Furthermore, the use of wood has in a number of applications compared to other materials some advantages regarding the sustainability implications, i.e. regarding social and environmental effects. On this background research is needed that investigates and provides market innovation processes in the forest and wood industry. This type of research could contribute to the improvement of competitiveness of and employment by the European forest and wood industry.

European relevance and collaboration: The research regarding the development of sustainable future markets for wood has just been started in Germany. At the European level there has virtually no research done in this area. However, the similar and interlinked market condition within Europe require a research activities at the European level.

4.3.7 Do different Corporate Cultures in Forestry Organisations affect their function?

Positioning: Basic

Short Description: Recently, new tasks have been added to the traditional tasks of the German and other European forestry services. These include the function as an intermediary between the forest and the society. For this, the service will need a new sensitivity for modern social perceptions, ideas and developments in a national and international context. The German Forestry Service is, compared to other European forestry services, strongly affected by the traditions and ideas of military, hierarchic and bureaucratic organisations like the armed forces or the Prussian civil service. It can be questioned, whether the German forestry service is equipped for the new tasks. We propose that the service will need more and different competences and a reorganisation of its corporate structure to perform the new tasks.

Justification: The corporate culture of an institution is the universal set of the commonly shared, conscious and preconscious perceptions, values, ideas, patterns of thought and patterns of behaviour. Thus, corporate culture is extremely effective in manipulating the perceptions, thoughts and behaviour of organisations and their members. We assume that the corporate culture of German forest services is highly effected by tradition and therefore these services show a low tendency to perceive the changing (needs of the) society, social developments and other trends. Thus, this corporate culture is more an obstacle for exchange than a intermediary between forest services and society. Consequently, the service acts autonomously and is dysfunctional towards new challenges and dynamic changes in society. The assumption will be verified by describing and analysing the origins of the corporate culture in the German forest services, its function in the structure of the service and its impact on the functioning of the service. The results of this study will be used to compile tools and recommendations for the reorganisation of the German forestry service, therewith leading to an improved functioning of this service in view of its new tasks.

European relevance and collaboration: The increasing significance of a common European policy towards forestry issues (e.g. FFH guidelines, Natura 2000 Initiative, certification of wood and wood products, Kyoto Protocol and Process) will inevitably have an enormous impact on the function and structure of the national forestry services. They will have a key role in the design of a structural and socio-economic framework for the realisation of an European-wide sustainable forest economy. Therefore, the integration of the national forestry services in a wider European network is inevitable. The integration process will be greatly aided by a thorough understanding of the individual national corporate cultures. Research groups also working on this or on related topics are situated at the forestry/environmental departments/faculties of the Universities in Vienna/Austria, Wageningen/The Neatherlands, Florence/Italy, Bangor/UK, Nancy/France, Zurich/Svizerland and at the EFI, Joensuu/Finland.

Sub-area 4.N Other

4.N.1 Flexible and automated transport and logistic of wood from forests to industry

Positioning: Applied

Short Description: The general aim consists in optimizing business processes between wood owners and industrial wood utilization via modern logistic management tools. Modern ICT solutions should improve the whole supply chain, from procurement and wood processing up to the customer. Logistic efficiency and efficient use of Information and Communications Technology (ICT) among firms (B2B) within and between regions, and between firms and the public sector (B2G) differ greatly among regions and process partners. An improved purchase logistic of raw material for wood processing is necessary and can be expected from FLEX-FOREST. Also the wood product distribution via electronic logistic tools for different partners in the intermodal transport chain can be managed and controlled. Flexible transport chain management should result in higher effectiveness in integrated forest management. Work packages: - Analysis of different procurement chains of wood, - conception for complete digital data and information flux client (forest owner) –customer (process partner, saw mill, wood component company), - prototype for improvement of logistic chains with electronic data and information management - simulation and case study; calculation and optimizing logistic costs for timber transportation with multimodal transport chains -dissemination of results in small and medium forest owner organisations as well as transportation organisations

Justification: European objectives. Different forms of wood owner organization in northern Europe and new member states need support for higher effectiveness in forestry and wood processing as a whole. Higher competitiveness for business processes between resource owners and wood processing industry via controlled logistic tools and services in the whole wood process management is expected. Modeling sustainable growth in regions with “semi level cities character” and rural areas , societal objectives like quality of life and employment can be guaranteed. To develop the Baltic sea Region to a dynamic business area in Europe Business goals (industrial relevance). Competitiveness in wood processing processes via improved automated ware house management (B2B), availability on time of the assortments of product specific wood species flexibility transport chain based on digital information Short text putting the research theme in a "scenario” context Analysis, conception, simulation of flexible transport chains the process improvement via the logistic part as knowledge based logistic management for sustainability . Advantages: reduce of manual work and redundant work, minimizing Media breaks, digital data interchange according standard protocols

European relevance and collaboration: A multidisciplinary team consists of different types of purchasers of raw material, economists, IT- engineers, Stakeholders should be created. partners already required: in Germany , Poland partner expected: in Sweden, Finland, Latvia, Russia, Austria type of partners. Wood owner, agents, dispatchers, wood processing industry, ICT competence,

4.N.2 Network for Education and sustainable development

Positioning: Applied

Short Description: Regarding sustainable development as a whole, the fact of education in schools, vocational training and life long learning is not well considered. ESD-Net will improve the knowledge about forest, forestry and wood processing for all ages beginning in the kindergarten with games about biology of forests, ecology, biodiversity, in basic schools, in vocational training and in universities. The general aim of ESD-net consists education for sustainable development as horizontal measure and social task for quality, improved knowledge and implementation of new technologies in sustainable forest management and wood industry with partners from education institutes, schools, forest offices. Work packages: -Analysis of demand in forestry sector - Content definition with stakeholders - Elaboration of content based knowledge tools - Multilingual pilot teach audio tools - Test phase with end users in Baltic countries - Prototype of modular education via elearning tools in the forest sector human resource management, mobility of young people, wood professions, building with wood (architecture), quality management Education and knowledge management with eLearning in forest and forestry sector via innovative IT-modules in a virtual knowledge based internet platform Teach audio as method to train forest staff about newest developments in the forest and Wood sector, biomass and biomaterial sector, training for students, vocational training

Justification: 1. European objectives. Sustainability in human resources development, life long learning, implementation of new technologies regarding standards knowledge as growth factor and knowledge based data management as key advantages. To strengthen a competitive knowledge based industry with high level of education and knowledge about research results (biomaterials, wood in construction, environmental performance of wood products, wood professions,..) Development of the Baltic area as knowledge area Network of actors in Germany, Poland, Latvia, Finland and Sweden Establishing education and training schemes to meet high requirements Improving the quality of knowledge and knowledge management tools 2. advantages In our days only separate education offers exist , there is no platform about condensed forest- forestry and wood industry knowledge like the proposed virtual platform or virtual university EWE-European Wood education

European relevance and collaboration: Major competence needed: forest officials, higher education, stake holders from industry Virtual network in forestry sector – knowledge cluster- virtual university Knowledge management data base Multilingual – 4 languages (English, German,) Partners already exist: Germany, Austria, Czech republic Partners required: Sweden, Finland, Latvia, Lithuania

4.N.3 Gender aspects of woodland management and forestry

Positioning: Basic

Short Description: Gender relations are relevant at all levels of social business and processes. Who is defining which crucial problem or which focal points of action or management? Who is participating how on defining and conducting power? Who is affected on management concepts and strategies? These questions are hardly treated neither at nations nor at EU level except several research efforts in Scandinavia and actual in Germany. Gender analyses are needed as case (country) studies to get data on the current situation. Next step should be to generate conditions and margins to integrate gender dimensions into the field of woodland management at the level of participating stakeholder organisations.

Justification: Integration of Gender aspects will be first a statutory task to realize gender equality. Second it is needed because our focus on problems and solutions in the field of woodland management is still androcentric and therefore doesn't meet demands, suggestions, approaches, solutions and life contexts of the society in its entirety. But this is necessary to reach broad participation in the active planning of woodland management and its social acceptance.

European relevance and collaboration: Country Case studies are needed and the elaboration of common tasks, goals and strategies.