Development and Implementation of Innovations in Croatian Forestry

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Abstract:

Paper presents the results of research on innovations and creativity in Croatian Forests Ltd (CF Ltd). The research was conducted during 2012 and it included 286 employees of the state forest company (CF Ltd). By questioning their perception and attitudes towards innovations and undertaken innovative acitivities, a framework picture of the status of innovativeness in forestry of Croatia was provided. The main tasks were to determine: the way in which innovations are perceived in company, types of implemented and most needed innovations, importance of the innovations for the company, their influence on income, factors which positively i.e. negatively affect innovation activities, attitudes towards knowledge, creativity, change, decision making, etc.

Through the testing of respondents' opinions and attitudes an unfavorable status of innovativeness in croatian state forestry has been found. The analysis of the key questions have shown that: company has a low innovation culture; employees seldom or never think about innovations; innovations related to production processes are the most common type of innovations. Other findings suggest that only 2-4% of employees consider that their work is being appreciated. Same percentage thinks that the company has a functional system for evaluation of ideas, and that it is effective in decision making. However, most employees state that there is a potential for innovations, and that work processes can be improved. As main impediment for stronger innovation activity they stress out lack of financial assets. Conducted research points out certain problems, but it mainly emphasizes the significance of innovations, stresses the need for innovations in forestry and contrubutes to raising forestry experts' awareness about the role and importance of innovations.

Key words: innovation, forestry, innovation policy, managing forest company, decision making, rationalisation, Croatia

1. Introduction

Innovation is the driving force of today's economy. Production and business practice in the developed world today are based on innovations, and innovation is considered to be the key factor of growth and development of modern companies. The role and importance of innovation have been recognized at the level of a common European policy. Innovation policy is the key factor in the "Lisbon Strategy" which outlines economic development of the European Union (EU) policy (CEC 2000). At the level of EU policy, innovations have been recognized as a crucial agent for the creation of economic growth and employment, and the strengthening of rural area development. Realizing that European Union seeks ways to strengthen the competitiveness between other participants of the global economy by increasing the innovative activities of European companies. Consequently, innovation represents one of the two explicit objectives of the EU (FP7 - seventh research framework program) that need to be achieved in order to create a European Research Area (Posavec et al. 2011a).

Today's forestry is also under the influence of technological (and other) innovations, and along with its own innovations in the sector, it must become competitive and profitable on a global level. In the context of Forestry policy, Ministerial Conference on the Protection of Forests in Europe (MCPFE) adopted the Vienna resolution on the Economic Viability of Sustainable Forest Management, which calls for the strengthening of innovation and entrepreneurship in this sector. Development of rural areas is one of the primary goals of the

EU, and forestry is directly involved in the technological, organizational, productive and recreational innovations that have or will occur in these areas to ensure their development. "Knowledge triangle" (research, education and innovation) in doing so, represents a major factor in european efforts to achieve the goals of "Lisbon Strategy" (Ojurović, Grbac 2007).

Innovation in general denotes successful introduction of novelties. In economic terms, innovation (Schumpeter 1934) represents the establishment of new product, development of new production process, opening and establishing new markets and developing new sources of supply of raw materials and other production inputs ("discontinuously occurring implementation of new combinations of means of production"). Nelson and Winter (1977) considere innovation as a non-trivial change in products or processes where there are no previous experiences, while Amabile et al (1996) argue that innovation is the successful implementation of creative ideas within the organization. According to the OECD (2005) innovation is the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations. Regardless of which definition used, it can be said that four things are essential for successful innovation:

- ⇒ New – something that previously had not existed or has been achieved by combining the available resources in a new and original way,
- ⇒ Better – introduction of something new just because it is new and possible, makes no sense and usually carries more harm than good,
- ⇒ Necessary – there must be a need for a solution to a problem or development of a new product or service,
- ⇒ Economicly justified – to fulfill its purpose innovation has to provide direct or indirect benefits to organization or individual.

The main reason why companies innovate lies in improvement of their business performance, such as increasing demand or reducing costs. The influence of innovation on the company's business ranges from effects on sales and market share to changes in productivity and efficiency. Important effects on the level of national economies and individual industries are also (positive) changes in international competitiveness and overall productivity, knowledge spillovers from innovation in businesses and increase of the total amount of knowledge in networks. Innovations can also improve the performance of enterprises by enhancing their ability to innovate. In forestry, innovations are developed in order to improve the competitiveness of forestry in relation to other economic sectors and in relation to the forestry sectors of various countries. Here it is assumed that the forestry and wood processing sector in their development necessarily have to turn to innovation and change as a condition of growth, i.e. quantitative and qualitative improvement in thinking and doing. To accomplish that it is needed to integrate innovation policy with forestry development strategies which must be coordinated with other areas (Rametsteiner et al. 2005, Martinić et al. 2006).

This paper presents the results of research on innovations and creativity in Croatian Forests Ltd (CF Ltd). By questioning the employees of state forestry company (CF Ltd) it is sought to identify the characteristics and position of innovation and creativity in the Croatian forestry. The research results reveal the perception and status of innovation, level of innovative activities, type of implemented an most needed innovations in CF, most important fostering and impeding factors, innovation potential and the relation towards knowledge, innovation and creativity in the Croatian forestry.

2. Methods and aim of the research

Primary object of the research is the state-owned company for the management of forests and forest lands in the Republic of Croatia (RC), Croatian Forests Ltd. Zagreb (CF Ltd). CF Ltd employ about 8500 employees, manage 2 million hectares of forest and forest land (about 75% of the total forest area RC) and represent, along with a much smaller proportion

of private and other forest owners, the main economic operator in forest management of Croatia.

The study of innovativeness in croatian forestry included a survey of the CF Ltd employees' attitudes. Innovation questionairre was developed based on the research conducted by Rametsteiner et al (2005) in Central Europe, and is adapted for use in CF Ltd. The structure of the survey questionnaire consists of six chapters and has a total of 44 questions of different character (open-ended questions, Likert scale assessment, multiple choice, yes/no questions). For the study the online version of the questionnaire (MS Sharepoint 2007) was developed, along with the classic option of acquisition, filling out and sending the questionnaire via e-mail. The entire procedure was thereby fully computerized and anonymous. In processing and analysis of innovation data analytical, comparative and descriptive techniques were used together with previous theoretical and practical knowledge in this area.

The aim of this study consists in determining the relation towards innovativeness and creativity, and realization of attitudes about importance and role of innovation in croatian forestry. The primary tasks of the research are following:

⇒ examine the perception of innovation and the level of innovativeness in CF Ltd,
⇒ identify the types of innovations and their implementation in the enterprise,
⇒ establish company's and employees' relations towards knowledge and innovation,
⇒ determine the factors that positively or negatively affect innovation activities.

In this way, an insight is gained into forestry company's business operations, its innovation culture and potential, readiness to innovate, acceptance of new ideas and implementation of change and novelties. At the same time, article emphasizes the importance of innovativeness, the role and benefits of innovation activities, and points out the need to develope and encourage innovations in forestry.

3. Results

The research was conducted during 2012, and a total of 286 employees of the state forest company (CF Ltd) responded to it. Table 1 shows the basic data on the profile of the respondents.

Table 1 General information on the innovation research respondents

Profile of the interviewees		%
Gender	• Male	79
	• Female	21
Age group, years	• < 30	13
	• 30 - 40	25
	• 40 - 60	56
	• > 60	6
Level of education	• Primary qualifications	1
	• High schoool diploma	5
	• Higher professional education	1
	• Faculty level	72
	• Postgraduate study	17
	• Other	3
Organizational unit/ level in CF Ltd	• Forest office / Working unit	46
	• Forest administration	38
	• Directorate	14
	• Other	2

The researsch was mainly intended for highly educated forestry experts (15% of the total number of CF Ltd employees), hence the largest proportion of faculty level examinees in the

number of respondents. In this sense, research findings, even with a relatively small number of subjects, provide valuable results and insights.

In the following section of the paper the responses to selected questions from the questionnaire are given. Findings on selected issues provide a good idea about the status of innovation in the croatian forestry, and relate to:

- ⇒ importance of innovation/innovativeness for the company,
- ⇒ innovation level of the company,
- ⇒ most common types of implemented innovations and most needed innovations in the companies,
- ⇒ relationship of company and employees towards change, ideas, decision making,
- ⇒ number of innovations, sources of impulse and information for the innovation projects,
- ⇒ impact of the innovation on company business and income,
- ⇒ limiting factors for the implementation of innovation.

In assessing the importance of innovation, the majority of respondents (66%) pointed out that innovations are of crucial importance for the company (Fig. 1). The answers show that the majority of respondents are aware of the significant role and importance of innovation, although there is still an unjustified high number of those who do not hold innovations much significant (34%). It should be noted that in a similar test conducted two years earlier (Posavec et al. 2011b.) these values were opposite, and most of the respondents then said that innovation is not crucial for the company. This indicates a significant increase in awareness of the innovation importance in forestry in the last period.

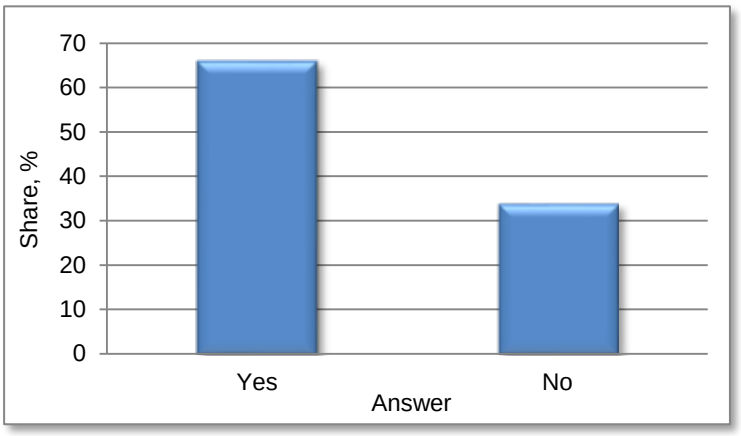

Fig.1. Innovations are of critical importance for the company

Contrary to the expressed awareness about the importance and role of innovation, a very small number of respondents (5%) considers CF Ltd to be an innovative company. As somewhat innovative company CF Ltd is assessed by 54% of all employees, and as extremely not innovative by very high 40%. These answers are pretty devastating and indicate a low level of development and implementation of innovations, suggesting that innovation is not receiving enough attention in the national forestry company.

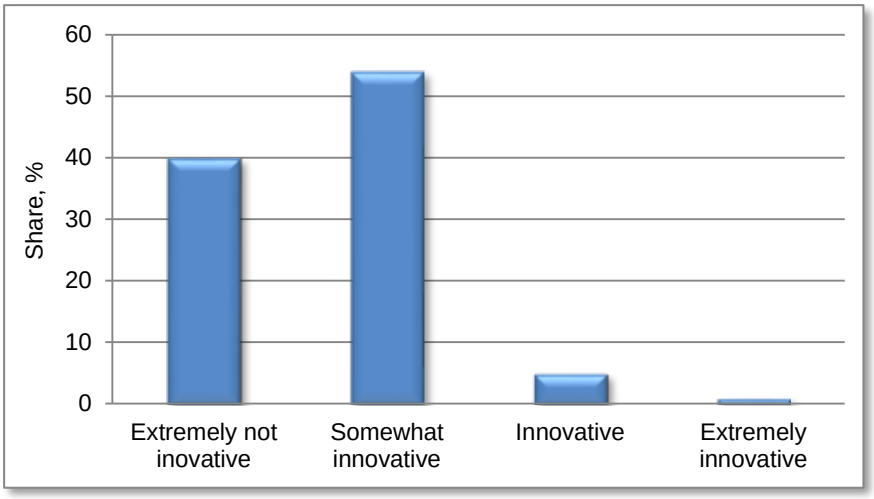

Fig. 2 Innovativeness level of the company CF Ltd Zagreb

Regarding type of innovation, production processes have been identified as the most common innovation area. However, about 35% of respondents believe that process innovations are being developed only in a standard frequency, 11% thinks that they are often or very often, while 54% of employees feel that they do not exist or are rarely implemented. Innovations in other areas are extremely low, and about 80% of the respondents state that innovation in products, marketing and organization are rare or nonexistent.

On the other hand, in assessing the types of innovations that are most needed by the company, organizational innovations are considered of vital importance for the development of company according to 62% of respondents. They are followed by marketing innovations, as well as product and process innovations with a rather similar results on importance (important, 24–32%, vital, 38–52%). A very small percentage of the examinees means that changes, ideas and innovations are not needed, only 5% or less, depending on the area. The above points to the need for stronger development and implementation of innovations.

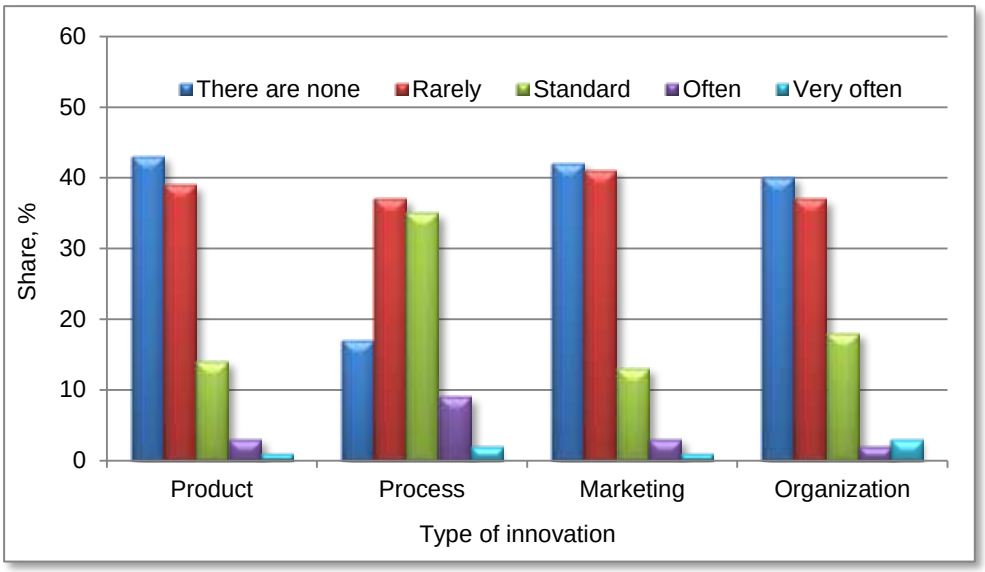

Fig. 3 Type of develped and implemented innovations

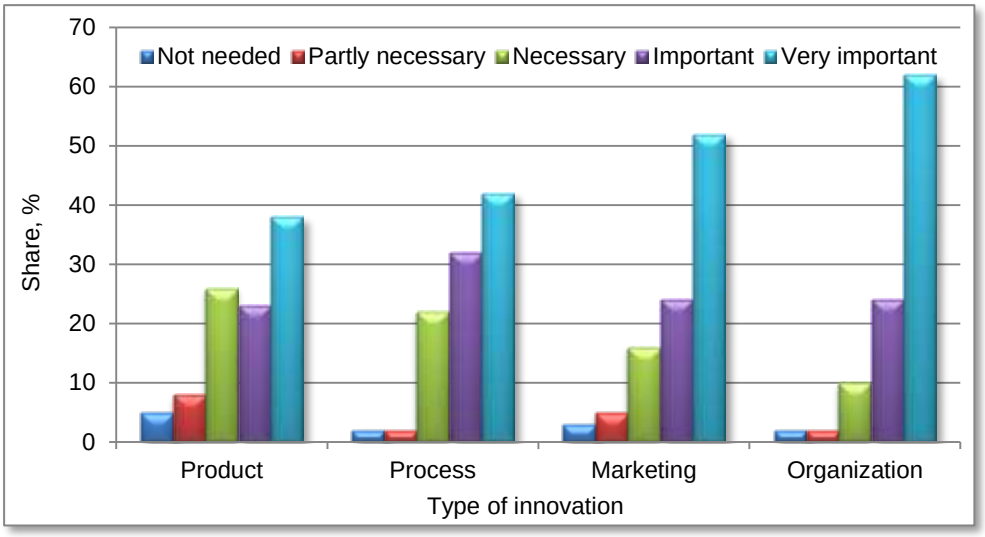

Fig. 4 The most needed types of innovation

The relation of company and employees towards ideas, innovation, valuation of work and decision-making is determined by the level of respondents' agreement or disagreement with seven statements offered in the study (Table 2).

Table 2 Relation towards ideas, innovations, decision-making an valuation of work (1 – totally disagree; 5 – totally agree)

Claim	Grades, %				
	1	2	3	4	5
Company is open to new ideas and suggestions from the employees	50	33	13	2	2
Company has a system for evaluating employees' ideas	62	28	8	1	1
I consider that I can enhance the production process performance	7	11	31	29	22
My workplace completely uses my potential	26	31	29	12	2
Company is efficient in making necessary decisions	38	37	21	3	1
Inovations and rationalizations are adequately rewarded	64	27	7	1	1
Level of personal income depends on the results of one's work	73	17	7	1	2

The main findings on this issue read as follows:

- ⇒ 83% of respondents believe that the company does not consider or rejects suggestions from employees without reasonable grounds, 2% of respondents consider that company is open to innovation,
- ⇒ 90% of respondents do not recognize an effective evaluation system of ideas within the company,
- ⇒ 51% of respondents believe that they personally could improve the performance of work processes,
- ⇒ 57% of respondents think that they were not assigned to the post, which takes full advantage of their work abilities,
- ⇒ 75% of respondents believe that the company is inefficient in decision making,
- ⇒ 91% of respondents find that innovation and rationalization of operations are not adequately rewarded,
- ⇒ 90% think that the work is not correctly valued and that personal income does not depend on the work results.

To the question "Did you introduce or plan to introduce an innovation in company business" 48% of respondents answered positively. Among them the majority make employees who reported one innovation (around 60%), while very few have introduced two or more innovations. As the most common sources of impulse for the development and implementation of innovations respondents (those who have introduced innovations) state themselves (personal engagement, motivation, etc), company and scientific institutions. As the most important sources of information necessary for the implementation of innovations respondents indicate professional organizations (chambers, etc), government institutions, conferences, professional journals and scientific organizations.

The point of introducing innovation, in general, is to improve business results and increase profit. However, in assessing the impact of innovation on the company's income most of the respondents (50–70%) points out that their influence in CF Ltd was neutral, with no effect whatsoever. 16–34% of employees states that implemented inovations had a positive impact on business performance, while 15% indicates a negative effect. Among the most common positive impacts/effects of implemented innovation are listed:

- ⇒ usage of IT in operations has accelerated processes and facilitates production and business activities,
- ⇒ introduced innovations have increased revenues and reduced costs,
- ⇒ Innovations in work organization have reduced the time required to execute the same workload (fewer workers, less field work days, lower costs),
- ⇒ simpler, better and faster way of work is enabled.

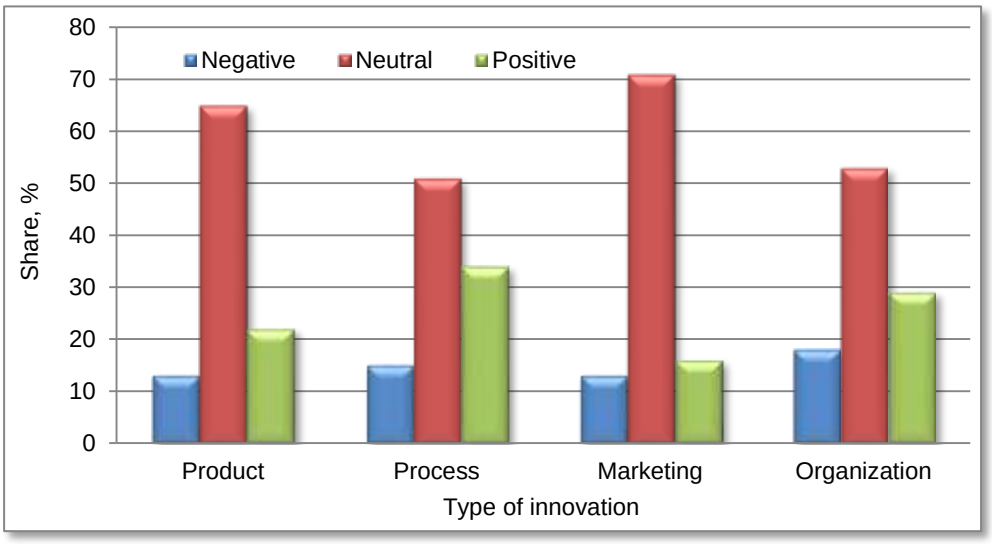

Fig. 5 Influence of implemented innovations on company's income

Factors that largely restrict a stronger innovation activity in CF Ltd, according to the respondents, are insufficient financial resources (39%). Scarce financial means are followed by regulations and legislative framework, unqualified pesonnel and other reasons (Table 3).

Table 3 Limiting factors for innovation development

Factor	Share, %
Financial means (company or own)	39,1
Unqualified pesonnel	18,6
Legislative framework, regulations	22,4
Cooperation with professional institutions (chamber)	5,0
Cooperation with scientific institutions (faculty, institute)	4,3
Other	10,6

4. Discussion and conlusion

Conducted research provides a framework picture of the status of innovation in croatian forestry. It points out to certain problems, but primarily emphasizes the importance of innovation as a means for achieving growth and development, and for gaining a competitive advantage in forestry, as well as in all other companies.

By examining the attitudes and opinions of highly educated employees in CF Ltd, a relatively unfavorable status of innovativeness in the state forestry company was been found. It is reflected in the low innovation culture of the company, rare innovation activities, lack of adequate incentives, bureaucratic obstacles, somewhat present process innovations and substantially neglected product, marketing and organizational innovation. A very small number of employees (2-4%) believe that the conducted work is properly valued, that personal income depends on the work results, that company has a functional system for evaluating ideas, and that it is effective in decision making. What also concers is very poor perception of the implemented innovations' effects, with a very slight impression on their positive impact on business improvements and increase of profit.

Modern business today requires from forest companies a constant changes, development and adjustment to market demands, with the activation of all capacities and strengths in order to become competitive and profitable on a global scale. Precisely innovations are regarded as a tool which can provide new products, new services, high added value, lower costs etc. to forestry. In this way it is possible to increase the competitiveness of forest products, encourage the development of forestry and wood processing industry, and provide successful answers to the challenges ahead. The findings of this research show that in raising the level of innovation, there is room for improvement of croatian forestry, and that innovations can be an important lever for further development of the forestry sector.

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