

RESEARCH RESULTS ON FOREST WORKERS' TRAINING IN GREECE

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Keywords: forest workers' training, forest operations, certification of vocational qualifications

Abstract: *Forest operations are among the most strenuous and hazardous professions in all fields of production. Productivity, efficiency, health and safety in forest operations need a well trained and motivated workforce, which is a precondition for the implementation of the multiple aspects of sustainable forest management.*

This study aims at presenting research results of a study on forest workers' training in Greece. Questionnaires and interviews of forest experts and of forest workers are used to investigate perceptions and attitudes on the organization of a forest workers' training system and its implications for the future of forest operations in Greece. The introduction of vocational training and certification of forest workers' qualifications are of primary importance for Greek forestry.

1. Introduction

Forest operations are among the most arduous and hazardous professions in all fields of production (Poschen 1993). Productivity, efficiency health and safety in forest operations need a well trained and motivated workforce, which is a precondition for the implementation of the multiple aspects of sustainable forest management.

It is estimated that in all subsectors of forestry about 15 million people are employed worldwide (Poschen 1997). Official data show a major decrease in the number of forest workers, in many European countries (BUS/BUWAL 2003, Gröger and Lewark 2002, Jacob et al. 1994). According to Salminen et al (1999) the numbers of Finish forest workers was cut down by 50% in the period 1990-1995 as a result of increased mechanization. In Sweden, the number of forest workers has been reduced by 90%, from 100,000 to 10,000 during the last 40 years for the same reason (Axelsson 1998).

Official data show a steady decline in the number of forest workers in Greece. However, the exact size of the forestry workforce can not be estimated from the official data due to the unknown number of the inactive members of the forest workers' cooperatives (Sakkas 1980, Tsioras 2004). Forest workers' cooperatives play a very important role in the contemporary Greek forestry, as, according to the current legislation, they are recognized as the exclusive works undertaking system in the framework of wood harvesting and utilization processes of the state forests, without being properly prepared for that (Efthymiou and Karabatzakis 1992). The fact that Greek forest workers rely on their on-the-job-experience and they don't have certified vocational qualifications, results in forest operations poor both in terms of quality and quantity of work. Furthermore, the lack of vocational training is responsible for the lack of professionalism which often results in split-ups in the cooperatives and the establishment of new ones. A paradox prevails in Greek forest operations: In some regions the workforce is not enough to challenge forest exploitation, whereas in other areas large numbers of forest cooperatives turn forest exploitation into a problem (Tsioras 2004).

This study was conducted to explore the following issues in relation to forestry workforce in Greece:

- To analyze perceptions and attitudes on how a forest workers' training system should be organized.
- To investigate possible implications of a forest workers' training system on Greek forestry.

2. Materials and methods

2.1 Selection of participants

The comparison of perceptions of forest workers and forestry experts was chosen as a means to explore forestry personnel perspectives in Greece. The selection of forestry experts was done following the "experts sampling method". A list of all experts on forest operations was done, consisting of university professors, researchers, and representatives of the private forest owners' union and experienced officers of the State Forest Service.

The selection of forest workers proved to be difficult, because the official data didn't provide up-to-date data on the active members of the forest workers' cooperatives. Therefore, despite the increased costs entailed, it was decided that all 13 prefectures chosen for the study would be visited and that the situation would be examined on site. This selection method was justified by our findings, since some cooperatives with especially strong presence in the past, had only few remaining members. Precondition for selection was the membership in a forest workers cooperative with continuous employment in forest operations during the last five years.

2.2 Questionnaire and interviews

The results originate from a mailed questionnaire to forestry experts nationwide and personal interviews held with forest workers in 13 prefectures. Data collection was based on a structured questionnaire with the majority of questions common for both participants' groups. The questionnaire was accompanied by a cover letter explaining the background and purpose of the study. In its first part, profile information was collected from all respondents. A five-point Likert scale was used to measure the perceived level of importance, where 1 = not at all important and 5= very important.

The questionnaire was pre-tested to check for biased, misleading, or confusing questions and to verify the quality and comprehensiveness of the retrieved information.

Personal interviews were conducted with the forest workers from the chosen cooperatives. During the interview procedure, most of the forest workers initially had a negative attitude against this study. Had the questionnaires been sent by post a very small return rate would have been expected. Furthermore, low literacy level represented another problem suggesting the use of personal interviews as the best way for data collection. Finally, informal follow-up discussions were provoked in order to assure the validity of the findings.

2.3 Statistical analysis

The responses were analyzed with the software SPSS Version 12. The criteria of normal distribution and homogenous variance of data were not met, as a result of the non-random sampling method used. Therefore, solely non-parametric analyses were used to explore comparisons between respondents' sub-groups and the relationships between variables. Because the responses were ratings, rather than a continuous measure, these data are not suitable for analysis of variance (SPSS 1998). The non-parametric alternative to a repeated measures analysis of variance is the Friedman test. The scores for each variable are ranked and the mean ranks for the variables are compared. Pearson's χ^2 test ($p \leq 0.05$) was also used

to test whether statistically significant differences could be found between the answers of the two groups of participants.

3. Results

3.1 Organization of the forest workers' training system

The dual system is preferred by 59% of the forestry experts και 70% of the forest workers (Figure 1). It is already used in the Greek vocational training system, combining the advantages of theoretical knowledge transfer along with practical experience in the enterprise. However, 20% of the participants to the study suggest that the forest workers' training system should be organized solely in the form of short training courses.

For the majority of both participant groups one year of training is regarded as sufficient (Figure 2). Second choice is "two years" which follows with a big difference. The results can be characterized as unexpected, by taking into account both the duration of similar training systems in other European countries as well as other vocational programs in Greece. However, it should be noted that the job definition of forest worker can range significantly, from the logger of the past decades to the experienced worker whose knowledge and dexterities can transform him into a useful forest management instrument. In the case of a module-based training system, the modules selection and duration can vary according to the needs of the group that will be trained. Especially in the dual system, due to the large variety of lessons, duration of one year is a limiting factor for the transfer of the necessary knowledge and dexterities.

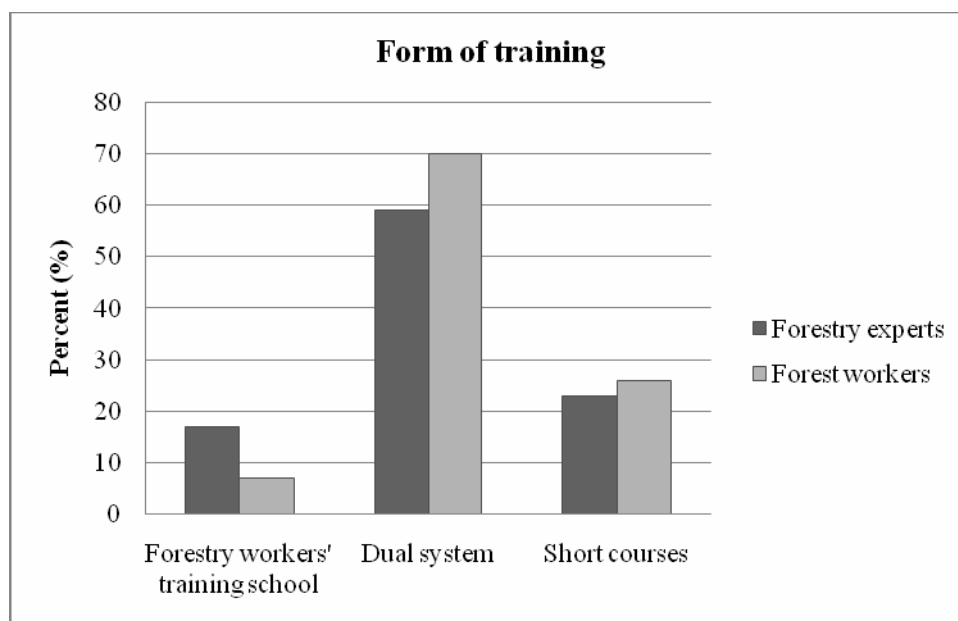


Figure 1: Form of the training system

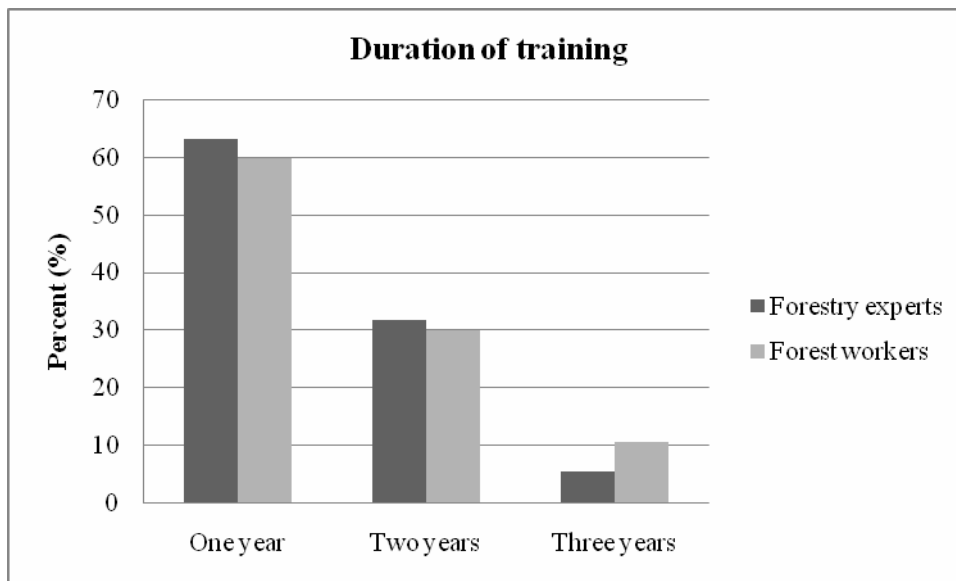


Figure 2: Duration of training

Short courses can be also used in informing the forestry workforce on new developments on working techniques and new machinery as well as of refreshing existing knowledge on safety and health in forest work. Forestry experts (50%) suggest the organization of short training courses every two years with duration of 6-10 days. Forest workers on the other hand propose the annual organization of training courses and of longer duration. Short training courses that took place during the 80's were connected to a small payment for the forest workers who participated. There probably lies the reason for proposing frequent courses of longer duration, as they are regarded as a means for increasing their, reduced during the last years, income.

Forestry experts seem convinced that a combination of different actors, among which ministries, institutions and public authorities can result in the optimum organization of a forest workers' training system (FWTS) for the Greek Forestry (Figure 3). Forest workers would prefer a FWTS solely organized by the State Forest Service, while a combination of different authorities is preferred by only 19.4% of them.

The answers received by the forest workers depict their close relationship to the State Forest Service. Almost all of the questioned forest workers have participated in short courses organized by the Forest Service and they have a year-long cooperation with the Forest Service regarding the forest management works. However, the forestry experts propose "a combination of participating bodies", which would facilitate a better organization of a FWTS.

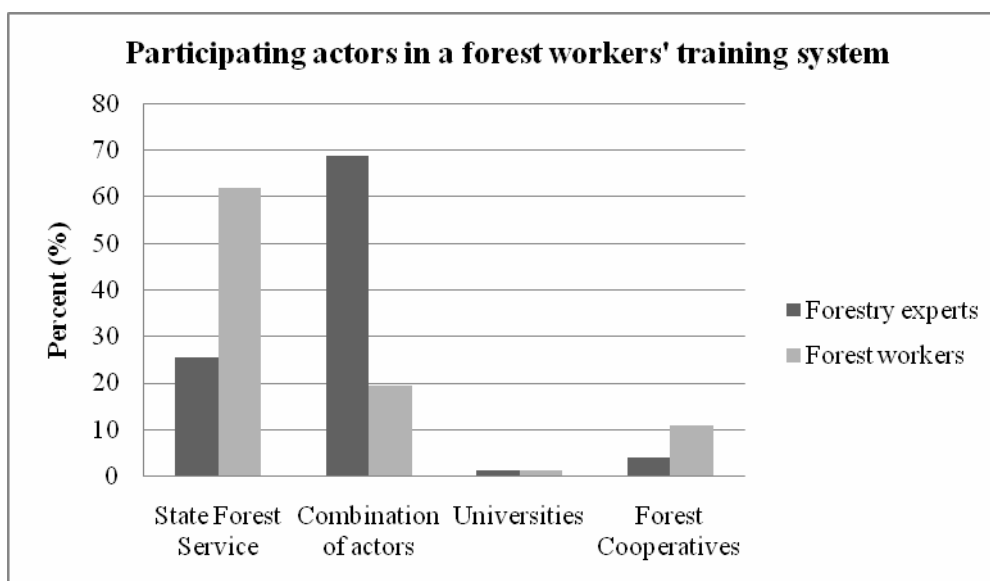


Figure 3: Public authorities, institutions and organizations that could participate in a forest workers' training system

Forestry expert were also asked to assess the specific fields where the above participating authorities, institutions and organizations would contribute the most (Table 1).

Table 1: Field of contribution of various social actors

| <i>Field of contribution</i> | <i>Participating actor</i> |
|--|--|
| <i>Provision of training buildings</i> | <i>Local government, Ministry of Education</i> |
| <i>Provision of trainers</i> | <i>State Forest Service, Universities</i> |
| <i>Provision of training material</i> | <i>State Forest Service</i> |
| <i>Organization of short courses</i> | <i>State Forest Service, Universities</i> |
| <i>Education control</i> | <i>State Forest Service, Universities</i> |
| <i>Certification</i> | <i>State Forest Service, Universities</i> |

3.2 Financing of the FWTS

The prevailing options for financing a forest workers' training system both respondents' groups are through "State" (67.7% and 76.2% respectively) and "European funds" (76.3% and 59% respectively). The option "personal costs" was chosen by only 7% of the forestry experts and 4% of the forest workers mainly due to the free access to all levels of education in Greece.

3.3 Trainees

The large majority of the forestry experts (60.6%) proposes that the future forest works must have at least completed the lower secondary education (Figure 4). Nevertheless, a requirement of a certain completed educational level will not result in a better training quality for 26.3% of the forestry experts and more than half of the interviewed forest workers. During the follow-up discussions the forest workers justified their opinion with what they think has happened in their case; they became competent forest workers although some of them haven't completed even the primary education.

Forestry experts insist on the prerequisite of a minimum educational level which can facilitate a better training quality. It is also a means for increasing the mobility of trained forest workers, in case they wish to continue their studies in the future in the upper secondary and later in the tertiary education. This will

be possible, if the training system is formed in such a way, that it will not block possible “career upgrades” (forest technician, forest engineer) in the future.

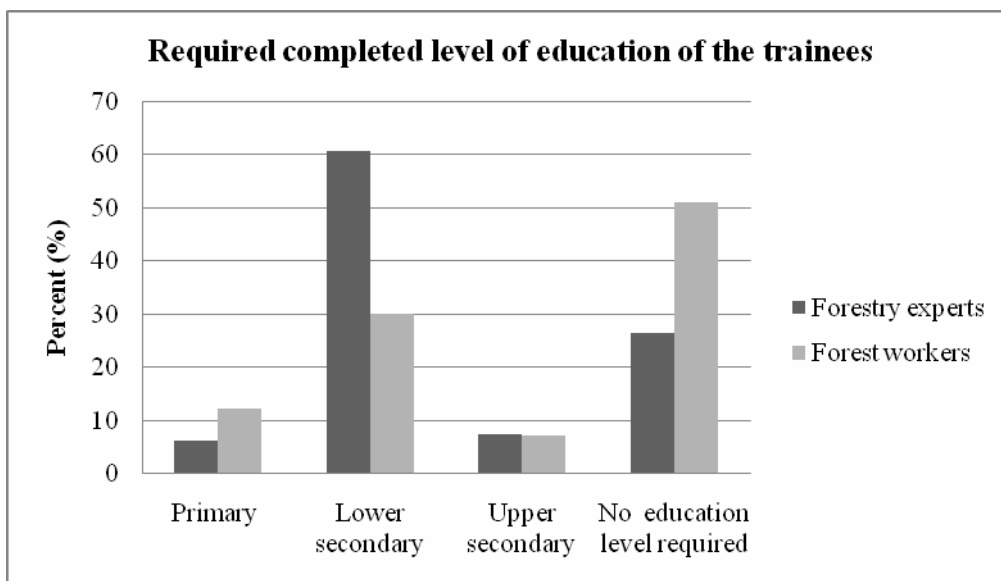


Figure 4: Required level of completed education for the participation in a FWTS

Best age for both groups of interviewees for participating in a forest workers training course is between 16-20 years (60.6% and 72.7% respectively).

More than half (54.6%) of the forestry experts and 37.7% of the forest workers support the existence of an upper age limit. This age limit varies for the majority of forestry experts between 31 to 50 years, while 51.3% of the forest workers propose an upper age limit of 30 years old. Prevailing reasons for the existence of an age limit is the “difficulty of the forest professions” (55.3% and 75% respectively) and “learning difficulties” (34% and 16.7% respectively).

3.4 Training content

Training distribution between practical and theoretical training is one of the most important considerations during the formation of vocational courses. The distribution “30%-70%” and “40%-60%” (theoretical put first) are the most popular among forestry experts, recognizing the need for a basic theoretical background (Figure 5). Forest workers propose “20%-80%” and “30%-70%”, obviously because of their own way of learning – the on-the job experience where theoretical knowledge is embedded but not directly traceable. As they have stated during the personal discussions, participating theoretical classes would probably entail learning difficulties for them.

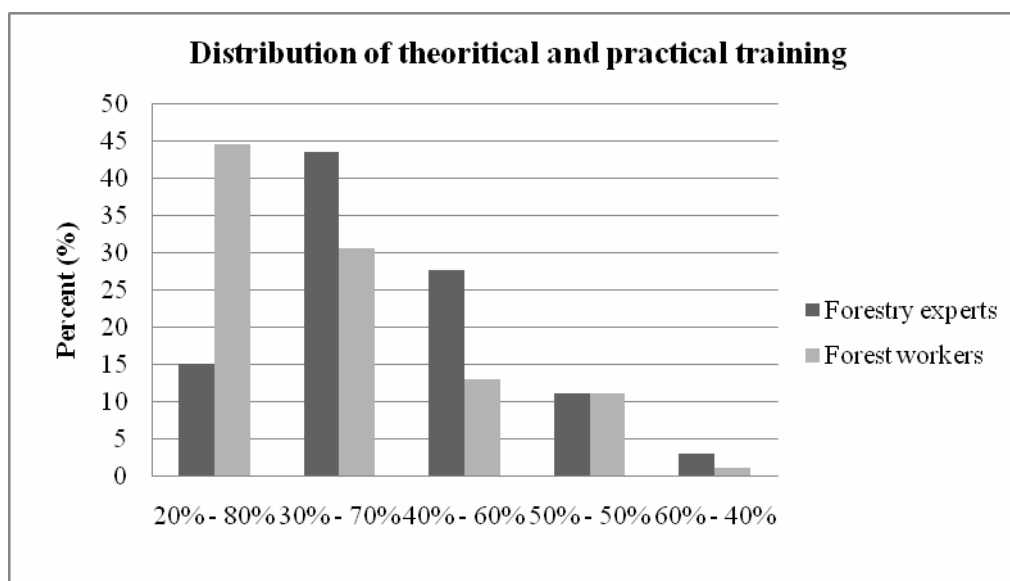


Figure 5: Distribution between practical and theoretical training

Forestry experts were asked to assess the importance of various training subjects. The results are included in following table.

Table 2: Importance of training subjects as assessed by the participants in the study

| <i>Subject</i> | <i>Mean rank</i> | |
|--|-------------------------|-----------------------|
| | <i>Forestry experts</i> | <i>Forest workers</i> |
| <i>Ergonomics</i> | 3.67 | 7.72 |
| <i>Harvesting of forest products</i> | 4.49 | 7.37 |
| <i>Cultivating and tending of forests</i> | 5.83 | 7.60 |
| <i>Management of forest workers' cooperatives</i> | 6.85 | 7.88 |
| <i>Combating of forest fires</i> | 6.87 | 7.04 |
| <i>Forest machinery</i> | 7.05 | 7.50 |
| <i>Reforestation</i> | 7.37 | 7.71 |
| <i>Ecology</i> | 9.86 | 11.46 |
| <i>Trading of forest products</i> | 10.01 | 8.15 |
| <i>Forest works' techniques</i> | 10.11 | 9.16 |
| <i>Building and maintaining of recreational facilities</i> | 10.18 | 10.12 |
| <i>Game management</i> | 10.80 | 10.92 |
| <i>Forest Law</i> | 10.81 | 7.72 |
| <i>Sociology</i> | 11.90 | 10.91 |
| <i>Use of computers</i> | 13.06 | 14.88 |
| <i>Management basics</i> | 13.18 | 8.30 |
| <i>Forest plant diseases</i> | 13.33 | 10.17 |
| <i>Foreign language</i> | 15.62 | 16.40 |

Subjects directly related to production techniques and safety such as “Ergonomics”, “Harvesting of forest products”, “Cultivating and tending of forests”, “Management of forest workers’ cooperatives”, “Forest Combating of forest fires”, “Forest machinery” and “Reforestation” come first (Mean rank 3.67- 7.37). Subjects of more theoretical content will follow (Mean rank 9.86- 15.62).

The high frequency of forest fires in Greece has probably influenced the forest workers to choose it as the most important training subject. It is very important to the forest worker to be capable of controlling and extinguishing a fire, without risking his life. It should be noted, that the forest workers assessed as more important, than the forestry experts did, subjects not directly related to the “core” of the forest professions such as “Forest Law”, and “Management basics”).

3.5 Trainers in the FWTS

Better qualified to be trainers are, according to the forestry experts are “Forest engineers” (85.86%), «Specialized forest engineers» (82.83%) and “Experienced forest workers” (75.76%). It should be noted that 7.07% of them proposes that medical doctors could teach the lesson of “First Aid”. Forest workers agree with forestry experts and highly suggest experienced forest workers to become trainers of the practical training subjects. Forest technicians get the lower approval rate for becoming trainers in both participant groups.

Work experience is a valuable qualification for vocational training trainers. The combination of a sound theoretical background and of work experience is necessary, especially in teaching work techniques and safety practices for forest professions. The trainers of the FWTS should have an average minimum work experience of 7.2 years according to the forestry experts and of 5.8 years according to the forest workers. Both participant groups prefer trainers with work experience between “3-6 years” with 41.8% and 52.9% respectively.

Forestry experts were asked to propose training subjects of special importance, on which the future trainers would have to be further instructed. “Wood harvesting” and “Ergonomics” come first (70.7%), followed by “First aid” (63.6%), “Work techniques” and “Forest machinery” (55.6%) και “Forest nursing” (54.5%).

Table 3: Need for further training of the trainers

| <i>Training subject</i> | <i>Percentage (%)</i> |
|--|-----------------------|
| <i>Harvesting of forest products</i> | 70.7 |
| <i>Ergonomics</i> | 70.7 |
| <i>First aid</i> | 63.6 |
| <i>Work techniques</i> | 55.6 |
| <i>Forest machinery</i> | 55.6 |
| <i>Silviculture</i> | 54.5 |
| <i>Forest works' techniques</i> | 43.4 |
| <i>Psychology</i> | 41.4 |
| <i>Reforestation</i> | 39.4 |
| <i>New developments in forestry</i> | 39.4 |
| <i>Forest fires</i> | 34.3 |
| <i>Didactics</i> | 33.3 |
| <i>Game management</i> | 29.3 |
| <i>Building and maintaining of recreation facilities</i> | 23.2 |
| <i>Ecology</i> | 21.2 |
| <i>Forest plant diseases</i> | 16.2 |

Interesting results can be derived as far as how helpful internet and multimedia technologies can be in a FWTS ($\chi^2= 5.944$, $df= 4$, $p= 0.203$). More than 69% of the forestry experts and 66% of the forest workers think that modern computer technologies can enhance the learning experience. Most of the interviewed

forest workers can not use a pc, however they favour the deployment of computers in class for various training purposes.

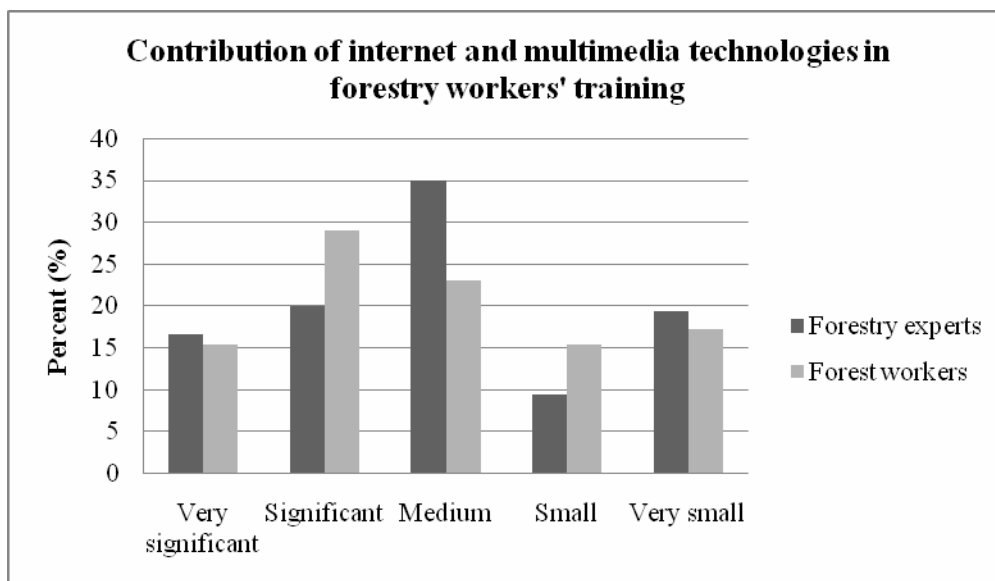


Figure 6: Use of internet and multimedia technologies in the FWTS

3.6 Contribution of a forest workers' training system to Greek forestry

Both forestry experts and forest workers seem convinced that contribution of a FWTS would be “very important” ($\chi^2= 1.22$, $df=2$, $p= 0.543$) (66.7% και 69.8% respectively) and “important” (28.3% and 22.6% respectively) to the Greek forestry (Fig 7). The need for introduction of vocational training is recognized as a means of improving the overall efficiency of the Greek forestry.

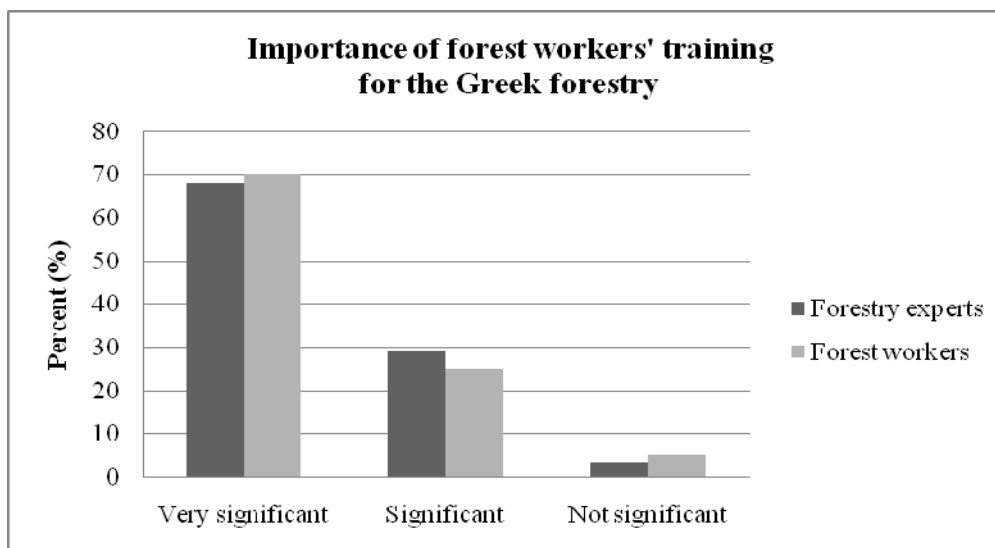


Figure 7: Contribution of a FWTS to Greek forestry

Both forestry experts and forest workers believe that the existence of a well organized occupation of the professional forest worker can contribute to the keeping of the young people in rural mountainous areas. The help is depicted in the answers “very high” and “high” which sum up to 90.9% of the forestry experts’ and 91.5% of the forest workers’ answers.

The trained forest workers are expected to have better career opportunities as members of forest cooperatives and as forest contractors according to the forestry experts (Table 4). Forest workers also rank first the perspectives as members of forest cooperatives followed in small distance by “employed by the State Forest Service”. At this point, employment by the State Forest Service represents the best working and wage conditions in the forest sector, combining steady income and social benefits.

Table 4: Work perspectives’ assessment of the trained forest workers

| | Rank mean | |
|--------------------------------------|------------------|----------------|
| | Forestry experts | Forest workers |
| Forest cooperatives members | 3.44 | 3.23 |
| Forest contractors | 2.96 | 2.70 |
| Employed by the State Forest Service | 2.60 | 3.08 |

There will be need for forest workers and forest machine operators according to 85.5% and 60.8% of the interviewed forestry experts (Table 5). Still less than 35% of them believe that the professions of supervisors, forest tractor operators will be needed in the future. According to the large majority of the forest workers, there will be need for all of the proposed forest professions in the future.

Table 5: Assessment of future needs of forestry workforce in Greece

| | Forest jobs | | | |
|------------------|----------------|-------------|--------------------------|---------------------------|
| | Forest workers | Supervisors | Forest tractor operators | Forest machinery operator |
| Forestry experts | 84.5% | 34% | 34% | 60.8% |
| Forest workers | 74.2% | 61.9% | 74.3 | 71.4% |

4. Discussion

The overall analysis of the results indicates important findings regarding the organization of a forest workers’ training system for in Greece. Different perceptions and attitudes are depicted in the answers of the respondents and basic guidelines for the future can be drawn. One of them is that the State Forest Service is expected to have a central role in the organization of a forest workers’ training system.

The dual vocational training system, an apprenticeship system in which training alternates between school and practice in the enterprise, is regarded as the best solution for training forestry workforce. The distribution between theoretical and practical training is another important factor, because a sound theoretical background will facilitate better understanding of the ecological functions and work techniques. Except for subjects directly related to production techniques, safety and health during work other general subjects such as Management basics should be added. Although these subjects are not directly connected to the forest jobs, they provide general but necessary knowledge. Another interesting finding is that both groups of participants propose the use of multimedia and internet technologies as a means of enhancing the training experience.

Trainers of the theoretical subjects can become forest engineers or specialized forest engineers, while experienced forest workers can teach the practical part. However, all trainers should have a work experience minimum of approximately six years. Prior to teaching all trainers must attend technical and didactics courses, which will facilitate a better training quality on their behalf.

An average deficit of 21.1% is identified in the quantity of the programmed forest works per prefecture in Greece (Tsioras 2004). This deficit underlines the need for more forest workers in order to carry out the

annual forest management plans. According to the large majority of respondents, trained forest workers will be needed in the future. However, there is a lot of space for improvement in the sector of Greek forest operations, because the forest workers don't have certified qualifications but rely on their on-the-job experience. Such knowledge may be unsystematic and haphazard, but can be supplemented through systematic adult training (Vik 1998). Today, formal vocational training is regarded as a basic precondition for every modern forestry. A very important finding of this study is that more than 90% of the study participants perceive the introduction of a forest workers' training system (FWTS) as very important for the forest operations' sector.

A forest workers' training system, must be accompanied by a certification system for the vocational qualifications of the forest workforce. The disqualification of forest workers who fail to certify their vocational qualifications will facilitate improvements in terms of productivity, quality of work and occupational safety and health. The interviewed forest workers react very positive to such a development, regarding it as a means to safeguard their current jobs.

Changes must also take place at legislation level. The introduction of new institutions, such as of the trained forestry worker, along with stricter control of the forest workers cooperatives are necessary measures for the rationalization of the Greek forest operations. The disqualification of inactive forest workers from their cooperatives is another measure in the same direction (Karameris 1981). Furthermore, stricter control can avert forest contractors from employing economic immigrants as forest workers who don't belong to a certain forest cooperative. As long as the present situation remains unchanged the perspectives for the Greek forest workers will remain poor.

Forestry professions traditionally functioned as the major source of income for the mountainous populations but the situation has changed during the last years. Responsible for this change are mainly socio-economical reasons such as the declining income and attractiveness of the forest professions. According to official data, mountain areas of Greece are populated by only 14.2% of the population (National Statistics Service of Greece 2001). However, Slee and Wiersum (2001) note that forestry can contribute towards rural development by either improving or innovating production processes, or by providing an ecological infrastructure for an attractive rural landscape. Therefore, it is imperative to maintain the existing number of forest workers, considering the fact that timber-related employment exerts a powerful multiplier effect (Theophile 1996). Efthymiou (2001) has estimated that a work volume of 12 hours per hectare of forest area in Greece could provide employment to 50,000-52,000 professional forest workers, who would be working 200 days per year. Such a development would imply a significant increase of rural employment in this mountainous country.

The job perspectives of the trained forest workers are expected to be better than today and especially the members of forest cooperatives. Nevertheless, the forest cooperatives which will consist of trained forest workers will have very little in common with the current ones; the introduction of vocational training and certification will establish a higher level of professionalism in Greek forest operations. Today, lack of professionalism can easily be identified, as the majority of the forest cooperatives are not well organized and refuse the undertaking of thinning operations (Efthymiou 1992). In addition, lack of information on new trends, equipment and developments further worsen the situation. Much inefficiency in terms of organisation and management of forest cooperatives could be mainly attributed to the lack of vocational training (Efthymiou 1992b, Tsioras 2004).

5. Conclusions

The findings clearly underline the need for introduction of a FWTS adapted to the special characteristics of the Greek forestry. There is urgent need for a well trained certified forest workforce which can successfully cope with the needs and requirements of a modern, sustainable forestry of multiple functions. The combination of new legislation, certification of vocational qualifications and real professionalism on behalf of the forest cooperatives can guarantee better job perspectives for the Greek forest workers.

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