Forestry Sector Market Survey

Use of Forest Information Technologies & Marketing of Forestry Services and Products
ACKNOWLEDGEMENTS

We thank all survey participants for their valuable contributions which has enabled us to produce this report. We hope that interesting results will compensate for the effort of taking part in this survey.

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SUMMARY

This market survey, based on an online questionnaire, focuses on the use of forest information technology and on market information and marketing channels.

The survey reveals a high demand for forest information technology like cloud based forest management software, hand held data collectors and aerial imagery acquisition to better achieve work goals. It shows further, that the most important sources for forest sector specific information are websites, blogs and professional publications. However, the conventional face to face contact (word of mouth, network and conferences) have been found to be the most important communication and marketing channel to promote services and products. Market barriers are especially perceived for obtaining funding for operations and expansion, for obtaining market price information for services and finding buyers of services and products. We also could show that “soft” organization activities like improvement of expertise, growing the reputation and communication of environmental and social responsibility are perceived as very important. Finally, we discuss how information technology could be used to grow reputation by documenting environmental and social responsibility and how real information can be used within a transparent marketing to grow the network and develop the customer group.

Providing this information, the survey intends to reflect on how to use forest information technology to professionalize forest management practice. The findings about market information and market channels can be used to further develop marketing tools for a successful sale of forest products and services.

All raw data is provided under the Creative Common license CC BY 4.0. This enables the reader to analyze the data set in accordance to his individual research questions. The data set is part of the Annex.
INTRODUCTION

Need for market survey

Working with organizations from the forestry sector we often perceive a lack of modern forest information technologies and software. However, to manage complex forest ecosystems and integrate the needs of multiple stakeholders, sufficient and efficient forest information technology is needed.

Working with small to medium sized forest organizations, we also perceived limitations to market forestry products and services. Though, in successful organizations all in-house created products and services need to contribute to a positive cash-flow. This strongly depends on the opportunity and capability to efficiently market forest products and services.

These findings have motivated us to conduct a market survey for a more detailed view on the use of forest information technology and the marketing practice. A deeper understanding will enable us to create tools to organize data management and marketing more efficiently.

Focus

For a better understanding of the use of forest information technology, potential improvements and market trends, the survey focuses on the following lead questions:

- Which forest information technology is used?
- How important is the current use of this technology?
- Is there a demand for new forest information technology to better achieve work goals?

In order to support efficient marketing of products and services the survey further asks about the following question fields:

- Target markets and potential market barriers
- Use of sources for new forest sector related information
- Communication channels to market products and services
Who should read this report

The survey is aimed at all who want to make forestry project management more efficient and sustainable. This includes field operations, administration, controlling and auditing but also forest software development.

It further intends to provide an insight for marketing and sales professionals by analyzing current marketing and sales practices for forest products and services, target markets and market barriers.

The purpose of the report is to support actors from the forestry sector to reflect their everyday work and make informed decisions to improve practice.

METHOD

The basis for the market survey is an English online questionnaire of 14 main questions with multiple sub-questions. The survey includes descriptive text questions, multiple choice questions with only one and with multiple answers allowed, questions with a ranking and questions with a rating scale (e.g. unimportant to very important).

For questions asking for the importance on a scale of low to high importance, we have weighted the importance by multiplying with a linear scale of 0 to 100 (see Table 1).

Table 1: Multiplication factors for rating scales with 3 and 5 choices.

<table>
<thead>
<tr>
<th>Importance</th>
<th>Multiplication factor for 3 choices rating scale</th>
<th>Multiplication factor for 5 choices rating scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high importance</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>High importance</td>
<td>100</td>
<td>75</td>
</tr>
<tr>
<td>Moderate importance</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Low importance</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>Very low importance</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

This allows us to calculate the average importance for one question and compare the importance between different questions. The percentage of importance expresses the maximum possible percentage of importance which can be achieved in the rating scale.
The survey has been promoted through social media (LinkedIn, Twitter, Facebook, etc.), the OpenForests newsletter, and blog announcements. Responses have been collected in a time period from the 6th of Mai, 2014 to 18th of June 2014. From 193 total responses only the 92 full responses have been considered in this market survey.

The results of the survey are presented in a very general way as the survey intends to provide a broad perspective on the topics. For a detailed analysis all raw data of the survey is provide as under a Creative Common license and remains publicly available. The reader is enabled in this way to analyze the data set in accordance to his individual research questions.
RESULTS

The survey results focus on four areas:

- Characterization of the survey group
- General activities of the survey participants organization
- Use of forest information technologies
- Market information and marketing

Survey group

Questions:

- Where is the location of your organization?
- How many persons are working in your organization?
- What is the type of your employer?
- What are your main fields of activities on your job?

The responses to the survey are differentiated by responses from 32 countries (6 continents), by organization size classification ranging from 1 to > 500 employees, by 9 different types of employers and a focus on main fields of activities on the job.

This differentiation of the survey group allows to analyze the data set for certain regions, organization sizes, employer types and fields of activities which allows more detailed analysis if wished. The data set remains publicly accessible (see Annex).

Location of organization

Chart 1: Distribution of survey participants by continents
At continent level with over 40 percent, North America is strongly represented in this survey, followed by Europe with 20 percent, Africa with 14 percent, South America and Asia with 9 percent each and Australia with 3 percent (see Chart 1). The reason for the domination of the Anglo-American area could be the setup of questionnaire in English language only. Further the distribution channels of the questionnaire like LinkedIn, Twitter and Facebook are dominantly used by people from the Anglo-American region.

**Organization size**

Organization size classes are strongly dominated with over 30 percent by organizations with 2 – 10 employees and followed by organizations with a size of more than 500 employees with 23 percent. The remaining classes were only ranging between 4 – 12 percent (see Chart 2).

Surprisingly the organization sizes do not follow an even or normal distribution as expected. If this distribution is not distorted due to an unsufficient sample size, the special distribution has to be considered when developing and designing solutions for forest information technology and marketing services.
Type of employer

The survey respondent's employer type was dominated by privately held companies with 31 percent and followed by self-owned with 19 percent, government agencies as well as self-employed with 11 percent each, educational organizations with 10 percent, public employment of 5 percent, partnership 3 percent and cooperatives 2 percent (see Chart 3).

Accumulating the responses from privately held, self-owned and self-employed companies, the private sector reaches a market share of over 60 percent. These results reveal the major importance of the private sector as customer for forest information technologies and marketing related services.

Chart 3: Distribution of survey participants by employer type
Main fields of activities

The activities conducted on the job by the respondents are very broad however dominated by activities related to forest operations. *Natural forest management, silviculture & reforestation* and *plantation management* together reach 24 percent. For details please see Chart 4.

![Chart 4: Distribution of survey participants' main activities on the job](image-url)
General organization activities

Questions:
- What are the services your organization provides?
- Please rate the importance of the following activities within your organization!

Services of organization

The distributions of services carried out by the organizations have been aggregated out of text answers by counting the repetition of the respective key words. With about 20 percent, *land & forest management* is the major focus of the organizations activities. It is followed by *consultancy* with 16 percent, *sustainability & conservation* with 12 percent, *product trade* with 9 percent, *information technologies, analysis and planning* with 9 percent and *timberland & investment management* with 6 percent. For more detailed information see Chart 5.

![Chart 5: Services of organizations which are represented by the survey participants](chart5.png)
Looking at the importance of these selected organization activities (see Chart 6) one can see that beside the improvement of expertise with an importance of 83 percent, “soft” activities like growing the reputation (81%), communication of environmental and social responsibility (76%), growing of network (74%) and creation of strategic alliances (71%) jointly show outstanding importance. Improvement of technical facilities (68%), efficient use of software and IT solutions (66%) also play an important role in the organization activities.

Forest information technology

The availability and importance of forest information technology steadily increases. It is interesting to know what kind of technology currently is in use, how intensively it is used and whether a demand for more information technology is perceived to better reach work goals.

The following charts show the distribution of the rated importance for each question item and the weighted aggregated average importance (see Method). Furthermore, several questions compare the current use of information technology with the demand for technology.
Questions:

Please rate the importance of the

- equipment that currently helps and/or would help you to achieve work goals.
- software that currently helps and/or would help you to achieve work goals.
- functions of a forest management software.
- third party services/products that currently help and/or would help you to achieve work goals.

Importance of forest information hardware

Looking at the importance of equipment currently in use, we can see that the use of laptops/computers with 92 percent is very high. This is reasonable as computers serve in a wide field of electronic data processing and are a prerequisite for other electronic field devices which communicate with computers. However, the demand for laptops/computers seems to be satisfied. Stagnation also applies to data collection on paper (decrease by
0.6 percent) which seems to be more and more substituted by electronic field devices. It has to be highlighted that there is a high demand for all kind of electronic devices which can be used to measure and record data in the field. The additional demand is ranging between 7 percent for GPS-devices and 29 percent for hand held data collectors. See Chart 7 for further information.

**Importance of software**

With 84 percent *Microsoft Excel* has been rated by far the current most important data processing software. It’s readily availability and ease use has made it a standard in data processing throughout the forestry industry. However the perceived importance of *Excel* has stagnated and already has decreased by 3 percent. Comparing the current importance of other data processing software to *Excel*, their importance is low and only ranges between 12 and maximum 50 percent. Though, the perceived additional demand for databases is ranging between 5 percent for *Microsoft Access* and 21 percent for *databases* in general. Further, for specialized databases like for forest management software there is a very high additional demand of 39 percent followed by project management software with 37 percent. A wiki for internal data management and documentation shows only a low current importance of 12 percent and an additional demand of 7 percent.

![Chart 8: Comparison of importance of software currently in use and the actual demand for such software](image-url)
Importance of forest management software functions

Chart 9 ranks and summarizes the importance of selected forest management software functions. The most essential function required within forest management software is a Geographic Information System (GIS) with an importance of 81 percent to document properties and sample plots. It is followed by forest inventory and key figures with 70 percent importance and data analysis and yield prediction with 68 percent importance.

<table>
<thead>
<tr>
<th>GIS - functions: maps, compartments, sample plots</th>
<th>Forest inventory, key figures</th>
<th>Data analysis and yield prediction</th>
<th>Data import and export</th>
<th>Planning and documentation of management measures</th>
<th>Income, expenditures balance</th>
<th>Automatic generation of reports</th>
<th>Data synchronization with handheld field devices</th>
<th>Assigning tasks also to third party contractors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high importance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High importance</td>
<td>81%</td>
<td>70%</td>
<td>68%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate importance</td>
<td>63%</td>
<td>60%</td>
<td>60%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low importance</td>
<td>57%</td>
<td>55%</td>
<td>53%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very low importance</td>
<td>55%</td>
<td>53%</td>
<td>53%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average importance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chart 9: Survey participants rating of perceived importance for specific forest management software functions

Importance of third party services

Aerial imagery related services currently show the highest importance with 39 – 56 percent. They are followed by cloud based software services with 36 percent, auditing with 36 percent, cloud based GIS software with 34 percent, other contracting services with 34 percent, marketing of products and services with 33 percent and SharePoint with 19 percent. The perceived highest importance increment is found for cloud based GIS software with 36 percent and cloud based software in general with 32 percent. The perceived demand increment for aerial imagery has been stated with 29 percent for LIDAR, 23 percent for airborne imagery and 20 percent for satellite imagery. It could be shown that there is a high demand for third party cloud services as well as for aerial imagery services. For detailed results see Chart 10.
To which markets does your organization mainly provide its services or products?

Where do you perceive market barriers for your services or products?

What is your source for new forest sector industry related information like research and scientific information, products, services and events?

How do you promote your services and products?

**Chart 10:** Comparison of the importance of third party services which currently help and which would help to achieve the work goals if they would be available

<table>
<thead>
<tr>
<th>Service Type</th>
<th>Very Important</th>
<th>Moderately Important</th>
<th>Not Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satellite imagery</td>
<td>56.41%</td>
<td>38.75%</td>
<td>11.24%</td>
</tr>
<tr>
<td>Aerial imagery</td>
<td>56.25%</td>
<td>38.75%</td>
<td>11.24%</td>
</tr>
<tr>
<td>LIDAR</td>
<td>56.25%</td>
<td>38.75%</td>
<td>11.24%</td>
</tr>
<tr>
<td>Cloud-based software</td>
<td>31.83%</td>
<td>31.83%</td>
<td>31.83%</td>
</tr>
<tr>
<td>Auditing</td>
<td>33.85%</td>
<td>33.85%</td>
<td>33.85%</td>
</tr>
<tr>
<td>Cloud-based GIS software</td>
<td>33.85%</td>
<td>33.85%</td>
<td>33.85%</td>
</tr>
<tr>
<td>Other contracting services</td>
<td>32.94%</td>
<td>32.94%</td>
<td>32.94%</td>
</tr>
<tr>
<td>Marketing of products/services</td>
<td>19.84%</td>
<td>22.84%</td>
<td>29.39%</td>
</tr>
</tbody>
</table>

**Market information & marketing**

**Target markets**

In Chart 11 it can be shown that nearly 80 percent of products and services of the survey participants are delivered to **regional markets** (40 percent) and to **local markets** (38 percent). Only 22 percent are delivered to **international markets**.
Market barriers

The highest market barriers are perceived for obtaining funding for operations and expansion with 58 percent, which is followed by obtaining market price information for services with 48 percent, finding buyers of services with 46 percent and finding buyers of products with 45 percent. See Chart 12 for further details.

Forest sector information

The most important sources for forest sector relevant information are websites/blogs with an importance of 75 percent, followed by professional publications with 74 percent, word of mouth with 64 percent and conferences with 59 percent. See Chart 13 for more detailed information.
Promotion of services and products

The most important channel to promote services and products has been the *word of mouth* with 34 percent, followed by the *company website* with 27 percent, the *network* with 26 percent, *conferences* with 26 percent and *social media* with 22 percent. See Chart 14 for more details.

![Chart 14: Importance of promotion opportunities for services and products](chart.png)
KEY FINDINGS

Employer types: Accumulating the responses from privately held, self-owned and self-employed companies the private sector reaches a market share of over 60 percent. Therefore the private sector plays a major role as user and customer for forest information tools and market information and marketing related services.

Organization size: The organization size classes’ distribution is strongly dominated by organization sizes of 2 – 10 employees with 30 percent and by organization sizes of > 500 employees with 23 percent. For the development of above mentioned tools and services the organization sizes, their special requirements and their frequency has to be considered to optimally address customer demands.

Importance of organization activities: The importance of selected organization activities has revealed that beside the improvement of expertise with an importance of 83 percent, “soft” activities like growing the reputation with 81 percent, communication of environmental and social responsibility with 76 percent, growing of network with 74 percent and creation of strategic alliances with 71 percent jointly show outstanding importance. Therefore public relation and marketing tools/services have to include considerations like:

- How to consolidate and build up reputation, for example by drawing attention on to the track record.
- How to communicate the social and environmental responsibility, for example by a regular impact reporting and presentation of best practice.
- How to build up and maintain trustworthy relations and strategic alliances to organizations with complementary experiences, services and products.

Demand for forest information technologies: The survey participants perceive a high demand for technical devices like handheld data collectors, growth and height measurement tools, laser range finder, smartphones and GPS-devices, to collect and measure data in the field to better achieve the work goals.

Demand for software: There is a very high market demand for forest management software with 39 percent, for project management software with 37 percent, for GIS software with 22 percent and for database applications with 21 percent.
Importance of forest management software functions: The most important functions required within forest management software are GIS – features with an importance of 81 percent to document properties and sample plots, followed by functionalities for forest inventory and key figures with 70 percent importance and features to analyzing data and predicting yields with 68 percent importance.

Importance of third party services: Within third party services the perceived highest importance increment was stated for GIS cloud based software with 36 percent and for cloud based software in general with 32 percent. The perceived demand increment for aerial imagery has been stated with 29 percent for LIDAR, 23 percent for airborne imagery and 20 percent for satellite imagery. Beside the demand for third party cloud software, there is a high demand for aerial imagery.

Market barriers: The highest market barriers are perceived for obtaining funding for operations and expansion with 58 percent, obtaining market price information for services with 48 percent and for finding buyers of services with 46 percent and for finding buyers of products with 45 percent.

Source for forest sector information: The most important sources for forest sector relevant information are websites/blogs with an importance of 75 percent, professional publications with 74 percent, word of mouth 64 percent and conferences with 59 percent.

Marketing channels: The most important channels to promote services and products are word of mouth with 34 percent, company websites with 27 percent, network and conferences with each 26 percent and social media with 22 percent. After word of mouth the organization webpage plays a major role for finding potential clients for products and services.
CONCLUSION

Our initial perceptions could be verified. It could be shown that the potential of forest information technology is far from exhausted. There is a high demand for information technology to better achieve work goals. Beside the demonstration of the potentials of existing forest information tools, this survey also has provided information on which functionalities are needed and might be further developed to better serve organizations to reach their work goals. Software developers might find the results helpful to specify priorities for use cases in their applications.

Turning to the importance of organization activities, we see the highest priorities addressing improvement of expertise, growing the reputation, and communication of environmental and social responsibility. We believe that the expansion and intensifying of such “soft” activities is needed to overcome high market barriers like obtain funding for operations and expansion. The demonstration of best practice - within the boundaries of environmental and social safeguards - and maintaining trustworthy alliances on the basis of transparency is necessary to become a reliable business partner.

There are plenty communication and marketing channels, like company websites, social media, brochures, sales platforms and advertisement in media, to promote services and products. However, the face to face contact (word of mouth, network, conferences) aim to be the most important communication and marketing channel. Highlighting word of mouth as the most important communication channel, it becomes obvious that delivering high work quality is the basis for successful marketing and sales.

Despite the product and service quality issues, a lack of sufficient market information about prices for services and products and about finding the right buyers of services and products reduce sales success. Structured market surveys as well as market associations to exchange market information are one option to tackle these barriers.

Further it is important to make products and services visible on the market. It enables potential customers to find and learn about your products and services. This can be done by improving the web-presence, professional publications, newsletters and social media announcements. A company blog can also improve the web-presence with regularly reports and target group specific sector information. Not at least the attendance of conferences contributes to marketing and sales successes especially for the case were target groups only partially be reached through social- or mass media.
ANNEX
Click the following link to download the survey data for your free disposition.

OpenSource Forest Sector Survey Data-Set