My Sustainable Forest

Earth observation services for silviculture

D6.11 STAKEHOLDERS WORKSHOP-2 REPORT

OPERATIONAL SUSTAINABLE FORESTRY WITH SATELLITE-BASED REMOTE SENSING

Project no.	776045
Project title	Operational sustainable forestry with satellite-based remote sensing
Project acronym	MySustainableForest
Start date of project	1 November 2017
Duration of project	36 months
Deliverable	D21 D6.11
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Organisation name of lead contractor for this deliverable	CFRI
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TECHNICAL REFERENCES

Project Acronym	MySustainableForest
Project Title	Operational sustainable forestry with satellite-based remote sensing
Project Coordinator	Julia Yagüe GMV mjyague@gmv.com
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Version	Date	Pages	Changes
V1	28/04/2019	26	First version of the document

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LIST OF TABLES AND FIGURES

1. INTRODUCTION

1.1. PURPOSE

This document corresponds to **Deliverable D21 D6.11 Stakeholders workshop 2 Report** of MySustainableForest H2020 Project.

1.2. SCOPE

This document is structured according to:

- Section 1, (present chapter) defines the purpose of the document and the project overview.
- Section 2, gathers the applicable and reference documents s well as the list of acronyms
- Section 3, presents the overall schema and objectives of the stakeholder's workshop throughout the project
- Section 4, Summarises the logistic references of the workshop: venue and date, host partner, specific workshop objectives, agenda and list of attendants
- Section 5, reports the subjects, and discussion items held during the workshop.
- Section 6, Annex 1 lists the production reached out by MSF producers at the time of the Workshop, presented through a life demonstration to the attendants.
- Section 7, Annex 2 shows some photographs of the event

2. APPLICABLE AND REFERENCE DOCUMENTS

2.1. APPLICABLE DOCUMENTS

The following documents, of the exact issue shown, form part of this document to the extent specified herein. Applicable documents are those referenced in the Contract or approved by the Approval Authority.

Table 2-1. Applicable Documents

Ref.	Title	Code	Version	Date
[AD.1]	Grant Agreement Nº 776045—MySustainableForest	Ares(2017)5215238	1.0	25/10/2017
[AD.2]	D01_D1.1_Project Plan	D01_D1.1	1.0	30/11/2017

2.2. REFERENCE DOCUMENTS

The following documents, although not part of this document, amplify or clarify its contents. Reference documents are those not applicable and referenced within this document. They are referenced in this document in the form [RD.X]:

Table 2-2. Reference Documents

Ref.	Title	Code	Version	Date
[RD.1.]				

2.3. ACRONYMS

The following acronyms have been used across this document:

Table 2-3. Acronyms

Acronym	Full term
AD	Applicable document
AOI	Area of Interest
GA	Grant Agreement
RD	Reference Documents
DEM	Digital Elevation Model
EEA	Europen Environmental Agency
LFCC	Land Vegetation Fraction cover
LIDAR	Light Detection and Ranging o Laser Imaging Detection and Ranging
MRV	Monitoring & Measurement, Reporting and Verification
MSF	MySustainableFrest
REDD	Reducing Emissions from Deforestation and Forest Degradation

Acronym	Full term
SFM	Sustainable Forest Management
VHR	Very High Resolution

3. STAKEHOLDERS WORKSHOPS PURPOSE

MySustainableForest envisages the realisation of four Stakeholder's Workshops. Locations dates and objectives are given in Table 3-1 below.

Table 3-1. Stakeholder's workshops planned in the GA

Workshop Nº	Location	Date	Objective
1	Brussels	M4 (February 2018)	Raising awareness in the market
2	Zagreb	M13 (November 2018)	Debate the technological benefits shown in demonstrations
3	Portugal	M27 (January 2020)	Debate the technological benefits shown in demonstrations
4	Lithuania	M34 (August 2020)	Boosting the adoption of the MySustainableForest results through the analysis of strategic enablers and barriers.

The workshops are expected to support the project evolution for what concerns the following aspects

- To gather user requirements
- To progressively develop a customer base able to act as local ambassadors in their respective EU Forestry region.
- To obtain qualified information to overcome market barriers, expected when introducing the planned technological innovation in the EU market, i.e: economic and regulatory, competitors and customers demand barriers
- To interact with the training material development, as a test-bed and improvement ground

The budget distribution –with no specific assignation costs for the 4 stakeholder's workshops- led partners, since the KoM, to the organisation of local-national stakeholder's workshops, covered by the effort accounted for the dissemination outreach activities. As a result, the impact of the Workshops has had a multiplying effect: the 4 workshops planned in the proposal and listed in Table 3-1 above have been (or will be) complemented with the workshop s listed in Table 3-2 below.

Table 3-2. Stakeholders workshops planned at local/national level, to reach out stakeholders unable to attend workshops abroad

Workshop Nº	Location	Date	Objective
1	Pamplona	M6	Present products and services. Debate the technological benefits shown in demonstrations
2	Ourense	M9	Present products and services. Debate the technological benefits shown in demonstrations
3	France	M23	Present products and services. Debate the technological benefits shown in demonstrations

4	Barcelona	M30	Present products and services. Debate the technological benefits shown in demonstrations
5	Oxford	M36	Present products and services. Debate the technological benefits shown in demonstrations

4. STAKEHOLDERS WORKSHOP 2 COORDINATES

4.1. VENUE AND DATE

The workshop venue was organised at “The Forestry Dome”, Ulica Ljudevita Farkaša Vukotinovića 2, Zagreb,10000, Croatia

Date: Monday 19th of November 2018

4.2. HOST

Stakeholders Workshop 2 was hosted by the Croatian Forest Research Institute (Hrvatski šumarski institut), CFRI partner in MSF project

4.3. WORKSHOP OBJECTIVES PRESENTED TO THE ATTENDANTS

MySustainableForest seeks the provision of geo-information services for integrated forest management, at pre-commercial stage, through a web service platform. Services combine in-situ data, satellite images from Copernicus satellite missions and other, LIDAR, airborne data and sound wave wood quality data. Services address issues beyond wood production and industrial transformation, such as: forest conservation, needs and requirements relative to climate change adaptation measurements, guidelines for national forests plans, national reporting obligations to the EU, biomass and CO2 stock counts, long lasting drought impacts, rising public awareness with reference to these new technologies in the wood sector.

Who provides the services? The value added IT companies of MySustainableForest consortium shall produce and provide the services. Specifically:

- GMV shall provide satellite based product;
- Föra shall provide LIDAR based products;
- MADERA+ shall provide wood quality products;
- EFI shall provide the socioeconomic analytical products.

Who shall test services quality and integration into end user's workflows? Some project partners are forest stakeholders, representing forest owners associations, transformation industries, research centres or national forest policy centres. Specifically, the following partners will test and validate the products:

- RAIZ, large industrial wood producer and pulp transformer, shall validate products for Portugal, in the context of Mediterranean forests and eucalypt plantations
- CNPF, the French National Center of Forest Proprietors, shall validate products for France, in the context of Atlantic forests
- **CFRI, the Croatian Forest Research Institute** that handles the National Forest Policy shall validate the products for Croatia in the context of close to natural lowland oak forests
- FORESNA, the forest owner's association of Navarre shall validate the products in Navarre, a strategic context that gathers Mediterranean, Atlantic and continental forests.
- UFE, the Faculty of Forestry and Wood Technology of the Mendel University in Brno shall validate the products for the Czech Republic in the context of continental beech and beech & oak forests
- FOAL, the Forest Owners Association of Lithuania shall validate the products for Lithuania in the context of continental Scots pine, Birch and Spruce forests

MySustainableForest Partners, through the Croatian Forest Research Institute, **welcome all Croatian sector agents**: forest managers, proprietors, sawmills, plantation managers, pulp producers, industrial timber producers, chemical-wood industries, policy makers, statistical officers and others.

Join us if you are interested in any of the following subjects: Sustainable forest management, protective functions of forest, forest damage, health and vitality, age and condition, biotic agents; biological biodiversity and forest fragmentation; monitoring systems and climate change adaptation; recreation, leisure and tourism; forest policy, forest management plans; protection of water and soil ecosystems; productive functions of forests, felling, roundwood, non-wood forest goods; mapping and landscape architecture; environmental protection and impact assessment, biomass stock and carbon sequestration, forest related labour force, labour risks and employment; rural employment sustainability; wood import-export; renewable energy targets; cultural heritage; cross-sectoral cooperation; innovation and technological development; pulp production and chemicals; forest education and professional training.

The workshop seeks to open up a debate with Croatian and Eastern European wood/forest Stakeholders on the technological benefits found in the EO based products generated by the project and demonstrated to attendants

4.4. AGENDA

TO BE ADJUSTED	**DAY 1 – Monday 19th of November 2018** **Workshop with Croatian Stakeholders**
09.30 11.00	▪ Welcome by CFRI and MSF ▪ Tour du Table personal presentations ▪ Brief presentation of **MySustainableForest project** in a Nutshell ▪ Presentation and review of **services portfolio**: Benefits ▪ Presentation of Products: EO, Lidar, Wood quality and Socio-economic services ▪ Introduction to the Service platform ▪ Discussion with Croatian stakeholders. Q&A ▪ Usage of services in Stakeholders production chain: when, how and what for using the presented services in my daily work
11.00- 12.30	Training attendants WRT service requests through the platform:
12.30-13.30	Lunch
13.30- 15.00-	Open Discussion between Project Partners (Service Producers and Stakeholders) and the Coratian Community of forestry and wood transformation Stakeholders attendants Discussion topics and questions. ▪ Trade off quality/price-cost/timeliness/ repetitively ▪ Service per service satisfaction into managerial workflows ▪ Appreciation of innovation

4.5. ATTENDANTS

The workshop gathered 60 attendants (11 project partners)

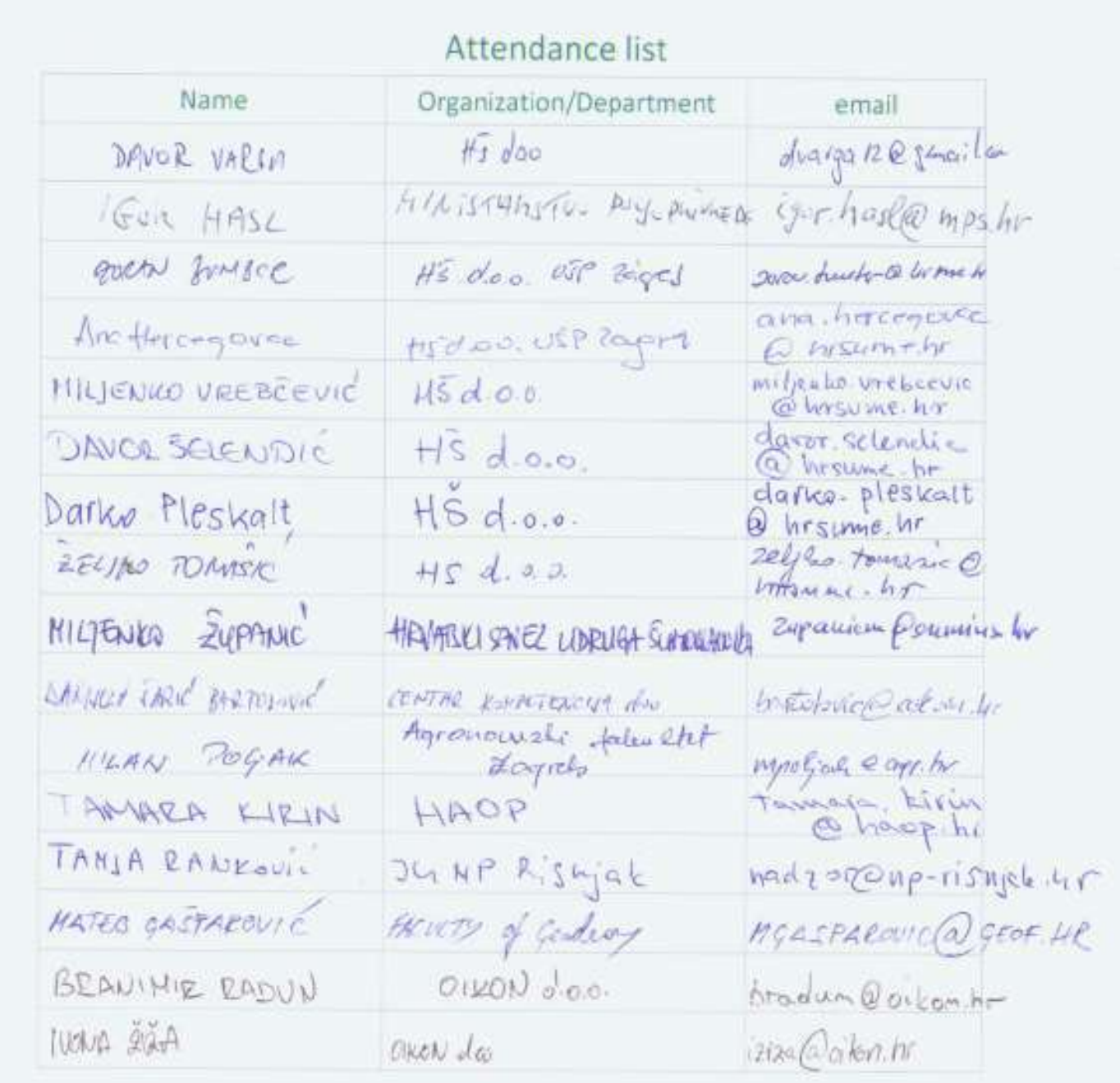
Months ahead of the Workshop, special effort was made by the Croatian Forest Institute to liaise and engage with National stakeholders.

Special invitation letters were issued to key stakeholders, on account of the experience and shareble contributions with which they could enrich the discussions.

- Dr. Sc. Damir Klobučar of Croatian forests Ltd. State-owned company Hrvatske šume d.o.o. (Croatian forests Ltd) has a mandate to manage the state-owned forests (about 80 % of forests), focused on the management of forest genetic resources in Croatia
- Dr. Sc. Mateo Gašparović, Dipl. Ing., Institute of Cartography and Photogrammetry, Faculty of Geodesy, University of Zagreb

The full list of attendants follows:

Table 4-1 List of attendants



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5. STAKEHOLDERS WORKSHOP 2 REPORT

Applying remote observations to silvicultural processes

On the 19th of November 2018, the Croatian Forest institute hosted an international workshop to showcase Croatian forest stakeholders the use and applications of satellite remote sensing to forest silviculture. The workshop was organized by and Dr. Ivan Balenović, from the Croatian Forestry Institute (HŠI) in Jastrebarsko.

Some 60 participants from 30 state and private companies took part in the second stakeholder's workshop, dedicated to share the implementation of the latest remote sensing technologies in silvicultural processes. The workshop was introduced by Dr. Ivan Pilaš, explaining the relevance of the event for the Croatian forestry community and wood transformation industry.

HORIZON 2020 project ***MySustainableForest*** propitiated the occasion for this dialogue, highlighted by the presence of Croatian institutions involved in international cooperation programmes, as well as **Hungarian** forest stakeholders.

MySustainableForest envisages the production of forest management applications based on satellite and Lidar images for specific purposes within various forest operations (forest inventory, forest management, forest protection, health monitoring, etc.) in order to be easily accessible, high resolution and fully operational in forestry. ***MySustainableForest*** seeks the consolidation of a forestry management web service, based on remote observations (satellite images, Lidar, wood quality non-invasive sonic measurements and socio economis statistical data) that can greatly improve various forestry and silvicultural production processes. The basis of services lean upon the satellite images of the new European missions Sentinel 1, 2, with a spatial resolution (pixel) of 10m.

Dr. Sc. Ivan Pilaš presented the goals and objectives for the day's workshop to the audience while steering to a fruitful dialogue from the point of view of the silvicultural experience and the sustainable management problems encountered in order to value the foreseeable benefits derived from the use of EO based products for the specific needs raised.

An **introduction to the Copernicus programme** was presented since the knowledge of Europe's satellite observation programme was not universal across the audience. The Copernicus programme provides Europe with comprehensive Earth Observation satellite constellations, carrying optical cameras, radar imagers, and atmospheric sounders, providing high-resolution images as well as a daily scanning of the Globe.

Items explained in detail to the audience included:

- Copernicus programme benefits: environmental, social, strategic, specific for the forest sector and for intermediate users (non-state companies, SMEs or public administrations)
- Examples of Copernicus images usage for the forestry sector were presented, noting the 13 spectral bands of Sentinel-2 satellites.
- Forestry applications were shown as one of the 10 most promising "value chains" in which Copernicus is currently used.
- Noting that 80% of forest area in Croatia is under government control, satellites support the emphasis placed on forest management, in terms of conservation and protection.
- Global SFM initiatives were mentioned, such as the UN's Programme on Reducing Emissions from Deforestation and Forest Degradation (REDD) and the Measurement, Reporting and Verification (MRV) procedures which make extensive use of satellite observation

- Sentinel-1 and 2 data were presented as recognised sources of valuable information along the forestry value chain.
- The capability of Copernicus data to provide forest authorities with accurate forest mapping, which is particularly useful for storm damages assessment, inventory and validation of forest strand for Wood purchasers. In this respect, the issue of the best possible Sentinel product scale was raised. European forest management has reached extremely detailed working scales; Sentinel products have to find its proper use across the silvicultural life cycle of forest management as complement and intermediate revisit of highly accurate measurements.
- The exploitation opportunities for intermediate users of EO data in the forestry domain, particularly relevant for private players (from micro-companies to larger players), public research institutions, and forestry management organisations.
- Forestry-aimed EO products are currently used by public end users mainly (90%), rather than by private end users (10%).

The following Copernicus applications for forestry were also commented and discussed; project service producers noted how Copernicus data and core products are ingested by MySustainableForest products chains.

- Specific land cover tools such as the High Resolution Layer (20m resolution), produced by the European Environmental Agency (EEA) as the EU entrusted Entity responsible for the Copernicus Land Monitoring service.
- Products to support the EU network of nature protection areas, in order to foster biodiversity
- Maps to monitor land that is in proximity of freshwater ecosystems
- Inventories of land cover historical imagery to highlight changes in land cover
- An upcoming small woody features product, that is based on Very High Resolution data and will be able to monitor small areas of trees
- Sentinel 2 Systematic Mosaic production tool

Dr. Julia Yagüe, GMV Project Manager, provided an overview of the actors and portfolio of products under development, as follows:

- Service providers, as industrial and institutional producers: GMV –focus on satellite products-, Föra – focus on LiDAR products-, Madera+ -focus on wood quality non-invasive products- and EFI –focus on statistical forest counts-.
- Forest stakeholders, as validating entities of the product portfolio: the Croatian Forest Institute; RAIZ, the Research Institute for Forest and Paper of the Navigator Corporation from Portugal; UFE, the Mendel University of Brno and the associated university forest company of Masaryk Forest in Křtiny, in the Czech Republic; FORESNA, the association of forest owners of Navarre in Spain; FOAL, the Association of Private Foresters in Lithuania and CNPF, the National Center for Private Foresters of France.
- All these stakeholders have defined areas of interest (AOIs) associated to their activities of members in which products are being produced, tested and validated (list of products in M13, this event, in Annex 1 below) .

For what concerns the forest services a complete list was presented, together with samples already accessible in the service platform.

- Forest Site Characterization: Forest mask, stand delineation, forest infrastructures, main forest types, stand height, forest age, burnt scars, clear cuts, site Index
- Wood Characterization: Wood density ranking, wood stiffness, strength class, stand density
- Biomass and CO2 stocking: Above Ground Biomass and CO2 Stock
- Forest Condition: Biotic damages, drought estimation, wind-snow-frost damages, forest vitality

- Ecosystem Vulnerabilities: Biodiversity-habitat fragmentation, flood risk indicator, soil erosion risk indicator
- Socioeconomic Conditions: Land physical account, physical woods accounts, monetary woods accounts

It was explained how the services are built up and offered from a point of view of increasing complexity: a first level products are considered “basic” (baseline site information, regular updates, authomatised products), such as the forest-no forest mask; the second level of products are considered as “advanced” (semi-automatic products, often requiring VHR data or field data gathering), such as the biotic damages; the third level of products are considered as “premium” (highly complex products, either because they require full manual intervention or complex field data sets) such as the site index product. Naturally, complexity levels do influence product cost in the incipient cost analysis.

The service is currently (November 2018) in the early production and testing phase; 2019 shall be the year for tested functionalities in order to complete the production cycle in 2020. For each of the selected areas of interest of project partners, the creation of a special operating interface with the selected products is planned. In Croatia two test sites have been selected for the purpose of the field of lowland forests of oak forests: Pokupni bazen in UCP Karlovac in the western continental part of Croatia and the lowland forest area of UŠP Našice, as well as the Spačva complex, UŠP Vinkovci in the eastern continental part of Croatia.

Each selected AOI presents singularities and specific needs that were shared with the attendants: the pests found in Eucalyptus globulus plantations in Portugal, the impacts of beetle pests in the Czech Republic, the losses due to longer drought periods in Croatia or the havocs after wind thrusts in France or Navarre. Moreover, forest fires are the worst threat, expanding to northern latitudes that hardly ever before had suffer such calamity. Wood thefts have come to add on to all the previous noxious impacts.

GMV computer expert Valerio Platania presented the components of the service platform. MySustainableForest service platform is the on-line tool for users to request products, share in-situ data, select the forest AOI, process bulky data, download and visualise the final service products. The platform is modular, structured in such a way that different products can be added on depending on the user's desire or needs. Services provide a detailed overview of the structure and functions of forests such as: structural elements of stands, wood quality, biomass and carbon stock, ecosystem features and economic value of forests. One of the main advantages of the platform is the possibility of implementing digital inventory noise using LiDAR technology, which greatly reduces fieldwork and increases the reliability of the measurement. The platform also allows the addition of user data for the validation of satellite and Lidar information.

Dr. Ivan Pilaš and Dr. Ivan Balenović from HŠI presented the role of the Croatian Forest Institute in the project, and more specifically through the AOIs, based on the possibility of obtaining detailed data on the basic parameters of forest stands using aerial photographs and LiDAR recordings. The work carried out thus far shows the excellent performance of using Sentinel 1 radar images of satellites in detecting changes in the forest cover. Dr. Iñigo Lizarralde from Föra testified about the great benefit of Spain's comprehensive LiDAR shooting for industry, education and administration, financially secured by for the government. The gain of such a recording is particularly noticeable in the inventory of forests, as the proportion of field measurements to be performed is significantly reduced.

Alan Novkinić from the UCP Koprivnica and Ivan Brezovac from UŠP Osijek introduced the interest about drones that were purchased as part of the Red Faith program. Novkinić presented concrete applications and results in the area of Croatian forests and highlighted the great advantage of fast data acquisition, which is particularly useful on inaccessible terrain. Brezovac presented the technical data and informed that a data processing program was purchased with the dron.

Boris Ljubojević from the Project for Services co-financed by the EU funds in the Directorate of Croatian Forests explained that in the final phase of the project, it is planned to issue manuals for revisers who would then be in charge of the management of drones, data processing and their input into the geoportal.

Davor Šelendić, employed in the Forest Management Service at the Directorate (Hrvatske šume d.o.o.), suggested that some functional geo-referenced recordings be placed on the web portal of Hrvatskih šuma d.o.o. so that they are available to all employees for all the stated needs. He found that it is necessary to achieve a sufficient accuracy of 80 or 90% for admission into legislation.

Darko Pleskalt from the Ecology Department in the Directorate referred to the needs of assessing the health status for forest protection, which is important in planning financial costs and evaluating completed works. He said that this technology expects the possibility of assessing the success of treating forest pests.

Representative of the Faculty of Forestry, University of Zagreb, prof. dr. sc. Irena Šapić from the Institute for Ecology and Forestation talked about the mapping project of the Plitvice Lakes National Park. The biggest problem highlighted the low availability of satellite images.

Dr. sc. Mateo Gasparovic from the Faculty of Geodesy in Zagreb paid attention to the landscapes of the Landsat mission that last 35 years and from which a 15 metered fusion channel can be obtained with multispectral footage for the entire world, almost every month of the year, depending on the shape.

Dr. Tamara Kirin, from the Croatian Agency for Environment and Nature raised up a key subject which links the Coprenicus Programme with the Public Administrations bound to report national environmental parameters to the European Commission under specific reporting obligations (Directives)

Representative of the Research Institute for Forests and Paper (RAIZ) from Portugal, Margarida Mendes, and the representative of the French National Center for Forestry (CNPF), Benjamin Chapelet, discussed about the forest management challenges derived from the fragmentation of the property structure in their countries and how satellite products help to trace annual forest cover changes and inter-seasonal biomass growth for fire danger estimations.

Prof. Dr. Gintautas Mozgeris, of the Association of Private Foresters of Lithuania (FOAL) informed attendees that since the 1950s, Lithuanian forest stakeholders have based their data records on aerial photographs and in-situ field campaigns and currently do not use EO-derived geospatial information, even though other national forest inventories (NFIs) use a combination of satellite and ground observation to assess their growing wood stocks. A century ago, the main objective to carry out forest inventories was to know the surface and the timber volume of the forest. Since then, the inventories have been expanding their objectives and, in addition to surface area and timber volume, they respond to many other issues such as carbon sequestration, forest health, forest biodiversity and ecosystem services.

Dr. Lumír Dobrovolný and Dr. Zdeněk Patočka from Mendel University in Brno brought into the discussion the major forestry problem faced by the Czech Republic which is the effect of European spruce bark beetle (Ips typographus), also extended throughout Central Europe. The increasing threat of plant pests is a worldwide phenomenon mainly driven by globalization of plant trade and the effects of climate change. In the last decade, the EU has been confronted with several large-scale outbreaks of new plant pests, threatening the Union territory as a whole. Experience shows that early detection of pests is crucial for their successful eradication and to limit their spread within the Union territory. Member States currently test or use several emerging EO-technologies, like drones and helicopters, for targeted, small-scale, plant health monitoring campaigns concerning quarantine pests.

Airborne hyperspectral and thermal high-resolution images can reveal infection symptoms in individual plants, often before they manifest themselves visually for field operators. Parallel work shows the possibility of tracking disease severity using Sentinel-2 satellite data and, in this sense, ***MySustainableForest*** product "Biotic damages" will seek solutions for the affection in the Czech Republic. European forest stakeholders, however, still perceive critical barriers for the uptake of this technology; due to unfamiliarity with the technology, the analytical methods in plant health services, operational costs and scale.

Valentino Marina Govigli and Eduard Mauri of the European Forest Institute in Barcelona, shared with the Croatian stakeholders the objective of the statistical products developed under ***MySustainableForest*** *and* how satellite information may complement such data need for "land physical accounts", "physical woods accounts" and "monetary woods accounts" as per UN methodologies. It is said that the EU requires harmonization of the criteria and terminology at the level of regions and states, based on which the standards of mapping and economic evaluation of timber stock will be created. European and national statistics need standardised regional indicators and geographical information. The products under production and validation create economic information throughout the wood life-cycle: planning, implementation, monitoring with a strong focus on territorial disaggregation and location based decision making. This information seeks to impact not only wood producers and transformation industries but, most important, the public administrations and the reporting to the numerous policies linked to forest management: regional statistics, territorial classifications and related indicators, coordination of geospatial information management, geospatial data production, contribution to harmonised land use/land cover statistics, and generally speaking, policies with a territorial dimension such as regional development, transport, agriculture, sustainable development, climate action and energy, just to name the most important ones.

The overall workshop conclusion showed that EO-derived geospatial information is not integrated in the actual way of working of forest stakeholders present, largely because it has not yet become clear which precise aspects of the use of Copernicus services are available for current application or could be ready within the next years. Accordingly, attendant forest stakeholders are interested in what Copernicus could bring to their silvicultural processes or policy areas (public administration representatives) and, as appropriate, they showed clear willingness to use the potentials of Copernicus. The problem is thus to fill in the gap between the available or potential EO-derived geospatial information and the concrete long-term and also day-to-day work of the forest exploitations.

The problems and needs shared and discussed between project and Croatian forest stakeholders, far from discouraging the goals of the project or new EO technologies, meant a new push ahead. The needs and interest on using EO based forest products for forest management, production and silviculture procedures

6. ANNEX 1 PRODUCTION AT STAKEHOLDER 2 WORKSHOP

Products issued for the Stakeholder 2 Workshop in Zagreb corresponded to AOIs relative to RAIZ (Portugal, 4 sites), CFRI (Croatia, 2 sites) and FORESNA (Navarra, Spain, 2 sites)

- Total number of products: 49
- Stakeholders serviced: RAIZ, CFRI, FORESNA
- AOIs covered: 8
- Products serviced via web platform
- NOTE: all stakeholders participated in the validation of products, although UFE, FOAL and CNPF did not receive products for their specific AOIs. Products could be validated as a generic sample.

Table 6-1. List of products issued at Milestone S1. M13. Stakeholder's meeting 2 in Zagreb, 19/11/2018

AOI acronym	Product code	Product name	Main input	Resolution	Reference_ year	Start_Date	End date	Producer
RAIZ1	S1 P1	FOREST MASK	S2	10m	2018	20181105	20181105	GMV
RAIZ1	S1 P4	MAIN FOREST TYPES	S2	10m	2018	20181105	20181105	GMV
RAIZ1	S1 P6	FOREST AGE	L5	30m	2018	20181105	20181105	GMV
RAIZ1	BB_LM_5	LIDAR-BASED STATISTICS IN PLOTS	LIDAR	10m	2018	20181105	20181105	FORA
RAIZ2	S1 P1	FOREST MASK	S2	10m	2018	20181105	20181105	GMV
RAIZ2	S1 P4	MAIN FOREST TYPES	S2	10m	2018	20181105	20181105	GMV
RAIZ2	S1 P6	FOREST AGE	L5	30m	2018	20181105	20181105	GMV
RAIZ3	S1 P1	FOREST MASK	S2	10m	2018	20181106	20181106	GMV
RAIZ3	S1 P4	MAIN FOREST TYPES	S2	10m	2018	20181106	20181106	GMV
RAIZ3	S1 P6	FOREST AGE	L5	30m	2018	20181106	20181106	GMV
RAIZ4	S1 P1	FOREST MASK	S2	10m	2018	20181105	20181105	GMV
RAIZ4	S1 P2	MAIN FOREST TYPES	S2	10m	2018	20181105	20181105	GMV
RAIZ4	S1 P3	FOREST AGE	L5	30m	2018	20181105	20181105	GMV
CFRI1	S1 P1	FOREST MASK	S2	10m	2018	20180821	20180821	GMV
CFRI1	S1 P4	MAIN FOREST TYPES	S2	10m	2018	20180821	20180821	GMV
CFRI1	S1 P6	FOREST AGE	L5	30m	2018	20180821	20180821	GMV
CFRI1	S4 P5	FOREST VITALITY	S2	10m	2018	20180831	20180831	GMV
CFRI1	S5 P1	WATERSHED DELINEATION	DEM	30m	2018	20181029	20181029	GMV
CFRI1	S5 P2	STREAM NETWORK	DEM	30m	2018	20181029	20181029	GMV
CFRI1	S5 P3	HABITAT FRAGMENTATION INDICATOR	Derived	10m	2018	20181029	20181029	GMV
CFRI1	BB_LM_5	LIDAR-BASED STATISTICS IN PLOTS	LIDAR		2018	20181115	20181115	FORA
CFR2	S1 P1	FOREST MASK	S2	10m	2018	20180821	20180821	GMV
CFR2	S1 P4	MAIN FOREST TYPES	S2	10m	2018	20180821	20180821	GMV
CFR2	S1 P6	FOREST AGE	L5	30m	2018	20180821	20180821	GMV
CFR2	S4 P5	FOREST VITALITY	S2	10m	2018	20180831	20180831	GMV

AOI acronym	Product code	Product name	Main input	Resolution	Reference_ year	Start_Date	End date	Producer
CFR2	S5 P1	WATERSHED DELINEATION	DEM	30m	2018	20181029	20181029	GMV
CFR2	S5 P2	STREAM NETWORK	DEM	30m	2018	20181029	20181029	GMV
CFR2	S5 P3	HABITAT FRAGMENTATION INDICATOR	Derived	10m	2018	20181029	20181029	GMV
FORESNA1	BB_LM_2	LIDAR_BASED_LFCC	LIDAR	10m	2017	20181115	20181115	FORA
FORESNA1	BB_LM_2	LIDAR_BASED_LFCC	LIDAR	20m	2017	20181115	20181115	FORA
FORESNA1	BB_LM_3	LIDAR_PERCENTILE_95	LIDAR	10m	2017	20181115	20181115	FORA
FORESNA1	BB_LM_3	LIDAR_PERCENTILE_95	LIDAR	20m	2017	20181115	20181115	FORA
FORESNA1	S1 P1	FOREST MASK	L5	30m	2011	20181115	20181115	GMV
FORESNA1	S1 P1	FOREST MASK	S2	30m	2017	20181115	20181115	GMV
FORESNA1	S1 P4	MAIN FOREST TYPES	L5	30m	2011	20181115	20181115	GMV
FORESNA1	S1 P4	MAIN FOREST TYPES	S2	30m	2017	20181115	20181115	GMV
FORESNA1	S1 P6	FOREST AGE	L5	30m	2017	20181121	20181121	GMV
FORESNA1	S1 P7	BURNT SCARS	S2	30m	2011_2017	20181121	20181121	GMV
FORESNA1	S1 P8	CLEAR CUTS	S2	30m	2011_2017	20181121	20181121	GMV
FORESNA1	S1 P9	DEM-Elevation	LIDAR	5m	2017	20181121	20181121	FORA
FORESNA1	S1 P10	DEM-Slope	Derived	5m	2017	20181121	20181121	FORA
FORESNA1	S1 P11	DEM-Aspect	Derived	5m	2017	20181121	20181121	FORA
FORESNA2	S1 P1	FOREST MASK	S2	10m	2017	20180821	20180821	GMV
FORESNA2	S1 P4	MAIN FOREST TYPES	S2	10m	2017	20180821	20180821	GMV
FORESNA2	S1 P6	FOREST AGE	L5	10m	2017	20180821	20180821	GMV
FORESNA2	S4 P5	FOREST VITALITY	Derived	10m	2017	20181031	20181031	GMV
FORESNA2	S5 P1	WATERSHED DELINEATION	Derived	30m	2017	20181029	20181029	GMV
FORESNA2	S5 P2	STREAM NETWORK	Derived	30m	2017	20181029	20181029	GMV
FORESNA2	S5 P3	HABITAT FRAGMENTATION INDICATOR	Derived	10m	2017	20181029	20181029	GMV

7. ANNEX 2 STAKEHOLDERS WORKSHOP 2 PHOTOS

Figure 7-1 General view of Croatian forest attendants to MSF Stakeholders workshop 2

Figure 7-2 MSF partners at Stakeholders workshop 2

END OF DOCUMENT

My Sustainable Forest

Earth observation services for silviculture

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