LIFE14 ENV/IT/000414
Demonstrating Remote Sensing integration in sustainable forest management
FRESh LIFE

ACTION C2
Large Scale Monitoring

Deliverable
Report of the large-scale monitoring

Firenze,
30/11/2019

Aims
With this action, the coordinating beneficiary AISF evaluates how the activities carried out in the four pilot areas will impact on the regional and national policy level. This will be carried out mainly with the distribution of questionnaires and direct interaction with partners and stakeholders. Large scale monitoring will be planned at the beginning of the project and carried out at the end of the project when the results from the pilot study areas will be clear.

Milestones e deliverables
In the Action C2, the following deliverables are expected:

Name of the deliverable	Deadline
D1 – Questionnaires preparation	31/07/2017
D2 – Report of the large-scale monitoring	30/11/2019

Progress
In order to evaluates how the activities carried out in the four pilot areas will impact on the regional and national policy level, the definition of a set of KPIs (Key Performance Indicators) was completed by consultation of partners and stakeholders that will help the coordination team to ensure that KPIs capture critical success factors perceived by partners and stakeholders as those results of project actions that determine satisfaction of their requirements/objectives.

The following KPIs were taken into account:

- knowledge and use of RPAS and data derived;
- cost of management;
- transparency in management of public forests;
- knowledge of their property by the private owners;
- percentage of forests managed with SFM;
- knowledge and use of SFM indicators.

For each of these indicators some related questions were included in the questionnaire sent in the first phases for an ante-project assessment. Moving in an unknown space created by the introduction of such innovative technologies this first assessment was essential to understand the starting point of the project and consequently adjust the activities of the last years in order to maximize the impacts. After the conclusion of the actions of group B these impacts are evident and together with a maturated knowledge on the social and economic assessment of the demonstration areas, it allows us an analysis of the post-project assessment without the need to re-submit the same questionnaire. The close collaboration between local partner and the related universities ensure a complete monitoring of the KPIs and their variation in the project period.

Despite this, a new questionnaire was developed to explore up-scaling potentials and needs of the project. The main targets of this questionnaire are European stakeholder interested in up-scaling collaborations and suggestions related to results achieved by our project but, by spreading it to the list of contacts collected during the demonstration events, we collected also information good to integrate the large-scale monitoring of the KPIs.

Knowledge and use of RPAS and data derived

Since the project proposal was prepared and approved the use of RPAS in the forest sector has become more frequent year by year, so with it also the knowledge of the stakeholders about the use of RPAS and data derived. Both in the research world than in the projects approved by the EU commission these topics have become central exploring different possibilities in use RPAS data derived for forest management and monitoring. The demonstration events that we organized during the first project year were one of the first occasions in which peoples take contact with RPAS. This was reflected in the great participation in those events that today is more difficult to obtain due to the increasing knowledge of people about RPAS and all the related topics.

Despite the knowledge about RPAS is increased, the user of these systems and data derived are still few and frequently related to demonstration or research purposes. The reasons for the low uptake of this topics are better explained in the technical report of action B4 and B5 where we explored the limits of RPAS applications in forest sector and the new technologies developed in these years to reach similar results.

Focusing on our project activities the impacts on the demonstration site stakeholders was very high. Less specialized managers, such are employers from municipalities or regions offices, that were completely out from these topics when the project started, are now aware of the potentials of new technologies and methodologies for forest management and monitoring. The availability of tools like the Forest Information System that we realized provide them with a huge amount of high resolution data that they can use to improve their management practices. Consequently, stakeholders from the forest sector working around the demonstration sites are forced to get in contact with this new Sustainable Forest Management knowledge. Freelance professional worker and private companies were involved in demonstration events and the changes in the way public bodies manage forest directly impact on their daily work.

Cost of management

As we highlight in the technical reports it is difficult to analyse the impacts of project activities on the cost of management variation. Products made available from FRESh LIFE project are hardly comparable with the "business as usual" situation with the consequent impossibility of a simple costs comparing. Data acquisition and elaboration with the methodologies proposed by our project leads to high resolution results that naturally needs higher costs but at the same time they have potentials that are not comparable with normal inventory data.

In a "business as usual" scenario tools like the Forest Information System are useless but the knowledge acquired by forest managers involved in our project change the way they manage their forest and with it their needs of data precision and availability for the Sustainable Forest Management.

One of the After-Life activities will be the monitoring of how freelance professional worker and private companies will take into account these variations in forest management policies and only later can we talk about cost analysis including not only the economic costs assessment but also considering the positive impacts on the entire forest sector of the areas.

Transparency in management of public forests and Knowledge of their property by the private owners

The demonstration approach of the LIFE project allowed us to organize a lot of events in the last years. Frequently these events were organized in the demonstration sites or in the local manager's premises giving the citizens of the area the possibilities to participate to the technologies and methodologies transfer. Despite the Forest Information Systems are not yet public the results achieved by the project were explained in Notice Boards installed both outside, in the demonstration sites, then inside the local manager's offices where people can read it to better understand the choices regarding the management of forest resources in the area where they live.

Percentage of forests managed with SFM

All the area of the selected demonstration sites is now managed following the indication of Sustainable Forest Management but the potentials showed by the Forest Information Systems created by the project allow us to go further.

Starting from the forest complex of Rincine, where the potential of the Forest Information System provided by the project has led the forest manager to consider the possibility of extending the surveys from the demonstration site to the entire forest in order to have the data necessary to base the new management plan on the methodologies developed by FRESh LIFE project. The same occurs for an additional forest area in Tuscany: "Riserva Naturale Statale Biogenetica di Vallombrosa" where we developed a Forest Information System (FIS) to support the revision of Forest Management Plan and to give to the students of forestry courses of University of Florence the opportunity to use FIS during their field courses. The area covered this FIS is around 1000 ha and the spatial data related to Forest Indicators were generated using UAV photogrammetric data acquired by eBEE and the LiDAR data acquired by aircraft in 2015 by Tuscany Region.

These experiences are important to push the regional administrations to include the new methodologies and technologies, proposed by project like our, in the implementation of new Rural Development Programs (PSR). The PSR is the greater way for financing and supporting agriculture and forestry at regional level. Our local partners, together with the universities associated, are in continuous dialogue with regional representatives to give them the information needed to move the regional forest policy towards Sustainable Forest Management through Precision Forestry methodologies. In this way, strong network was already established with Tuscany and Molise Regions also to lay the groundwork for harmonization efforts at national level as explained in the previous paragraphs.

Knowledge and use of SFM indicators

During the action B4, when the Forest Information System was activated in the local manager's offices, they started to explore the potentials of the SFM indicators. Sure the local stakeholder initially thought that these indicators are only another quantitative variables useless for their daily work but soon they have discovered the potentials of the high resolution data present in the FISs. The uses of the FISs and the SFM indicators contained in it are described more in details in the Technical Report of Action B4. Despite other indicators the important features recognized by the stakeholder in the SFM indicators are the harmonization at the European level and the strictly connection between

quantitative and spatial values. This allow forest managers to use the indicators both for the daily work of local planning then in the participation to national or international calls and proposals about forest management and monitoring.

During the last year of project activity particular attention was paid to disseminate this knowledge outside from the partner offices to the freelance professional worker and private companies active around the demonstration sites. The great participation of the local communities in the final events organized in Palermo and Caprarola during November 2019 prove the increasing interest in the practical application of the new technologies for the forest sector. Furthermore, SFM indicators have proved to be easy to understand and apply that is a key feature for their usability at a local management scale, outside the research world.