D10.3 – Annual Report on SILVANUS Dissemination Activities v2

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 101037247

Project Acronym	SILVANUS
Grant Agreement number	101037247 (H2020-LC-GD-2020-3)
Project Full Title	Integrated Technological and Information Platform for Wildfire Management
Funding Scheme	IA – Innovation action

DELIVERABLE INFORMATION

Deliverable Number:	D10.3
Deliverable Name:	SILVANUS - Annual Report on SILVANUS Dissemination Activities v2
Dissemination level:	PU
Type of Document:	R
Contractual date of delivery:	30/09/2023 (M24)
Date of submission:	30/09/2023
Deliverable Leader:	Micro Digital (Work Package 10 Leader)
Status:	Final Version
Version number:	V2
WP Leader/ Task Leader:	WP10 – MD
Keywords:	Dissemination, communication, exploitation, standardisation, events, conferences, newsletter, video, social media, television
Abstract:	The annual report on SILVANUS dissemination activities focuses on summarizing the key events (presentations at workshops, webinars and conferences) and tools (website, social media, newsletter, video) disseminated to stakeholders during the second year of the project, along with the depiction of the next steps in the exploitation processes, which includes the Centre for Adaptation Strategies and Development. Actions on stakeholder engagement are explained in detail, collaboration with other H2020 Innovation Actions are described, and a report on the current status of standards and compliance for the interoperability of SILVANUS platform is given. The Deliverable finishes with a summary on future communication and dissemination activities, which will be explained in detail in the following report in one year.

Lead Author(s):	Lovorko Marić (MD), Ricard Munné (ATOS), Gianpiero Lacovara (LETS), Andrea Majlingova (TUZVO)
Reviewers:	Georgios Sakkas (KEMEA), Sofia Katsifou (PSTE), Krishna Chandramouli (VTG), Kayvan Yousefi Mojir (HB)

Disclaimer

All information in this document is provided “as is" and no guarantee or warranty is given that the information is fit for any particular purpose.

The user there of uses the information at its sole risk and liability. For the avoidance of all doubts, the European Commission has no liability in respect of this document, which is merely representing the authors view.

Document History			
Version	**Date**	**Contributor(s)**	**Description**
V0.1	21.07.2023	Lovorko Marić (MD)	Table of contents
V0.2	16.09.2023	Lovorko Marić (MD), Ricard Munné (ATOS), Gianpiero Lacovara (LETS), Andrea Majlingova (TUZVO)	First draft
V0.3	29.09.2023	Lovorko Marić (MD), Ricard Munné (ATOS), Gianpiero Lacovara (LETS), Andrea Majlingova (TUZVO), Krishna Chandramouli (VTG)	Final version

List of Contributors

Partner	Author(s)
MD	Lovorko Marić
VTG	Krishna Chandramouli, Ebroul Izquierdo
TUZVO	Andrea Majlingova, Lenka Marcinekova, Yvonne Brodrechtova
PUI	Iliana Korma, Philippe Besson
ATOS	Ricard Munné, Alberto Miranda Garcia
LETS	Gianpiero Lacovara, Ozgur Sevgi Canarslan, Marcello Sacchetti
Z&P	Alexandre Lazarou, Domenica Casciano
PEGASO	Michele Corleto, Roberta Allocca
UASVG	Antonio Klobučar, Jana Miriovsky, Marija Dolores Rotim
SGSP	Pawel Gromek, Michal Szota
CSIRO	Paulo Borges
KEMEA	Georgios Sakkas, Nikolaos Kalapodis
PSTE	Roula Kechri
ASSET	Marino Spilotros, Giovanna Mangialardi
CTL	Georgia Christodoulou, Konstatinos Avgerinakis
HRT	Iosif Vourvachis, Meni Kourkouta, Alexandros Giordanis
WUT	Wojciech Mazurczyk
HVZ	Mario Starčević, Željko Cebin
UISAV	Zoltan Balogh, Ivana Budinska, Emil Gatial

List of acronyms and abbreviations

ACRONYM	Description
ADAI	Association for the Development of Aerodynamics
AI	Artificial Intelligence
AR	Augmented Reality
ASSET	Regional Strategic Agency for Ecological and Sustainable Development for Apulia Region
CASD	Centre for Adaptation Strategies and Development
Capex	Capital expense
CSA	Coordination Support Action
DL	Deep Learning
DX.Y	Deliverable X. Y (X refers to the WP and Y to the deliverable in the WP)
DEFEA	Defence Exhibition
EAB	External Advisory Board
EI	Expected Impact
EU	European Union
ENS	Emerging Network Security
GA	General Assembly
GDSO	Green Deal Projects Support Office
HaZZ	Forest and Rescue Service
IA	Innovation Action
IoT	Internet of Things
IPR	Intellectual Property Rights
IFFRC	International Forest Fire Research Conference
IFSA	International Forestry Student Association
ISCRAM	International Conference on Information Systems for Crisis Response and Management
KPI	Key Performance Indicators
ML	Machine Learning
MVP	Minimum Viable Product
NLC	National Forest Centre
Opex	Operating expense
PUI	International Emergency Firefighters
RTO	Research and Technology Organisation
RTVS	Slovak Radio and National Television

ACRONYM	Description
SFC	State Forestry Corps
SWOT	Strengths, Weaknesses, Opportunities and Threats
TRL	Technology Readiness Level
UAV	Unmanned Aerial Vehicle
UGV	Unmanned Ground Vehicle
UN	United Nations
UP	User Product
VR	Virtual Reality
WFRM	Wildfire Risk Management
WG	Working Group
WP	Work Package
WRL	Wildfire Resilient Landscape

List of beneficiaries

No	Partner Name	Short name	Country
1	UNIVERSITÀ TELEMATICA PEGASO	PEGASO	Italy
2	ZANASI ALESSANDRO SRL	Z&P	Italy
3	NETCOMPANY-INTRASOFT SA	INTRA	Luxembourg
4	THALES	TRT	France
5	FINCONS SPA	FINC	Italy
6	ATOS IT SOLUTIONS AND SERVICES IBERIA SL	ATOS IT	Spain
6.1	ATOS SPAIN SA	ATOS SA	Spain
7	EMC INFORMATION SYSTEMS INTERNATIONAL	DELL	Ireland
8	SOFTWARE IMAGINATION & VISION SRL	SIMAVI	Romania
9	CNET CENTRE FOR NEW ENERGY TECHNOLOGIES SA	EDP	Portugal
10	ADP VALOR SERVICOS AMBIENTAIS SA	ADP	Portugal
11	TERRAPRIMA - SERVICOS AMBIENTAIS SOCIEDADE UNIPESSOAL LDA	TP	Portugal
12	3MON, s. r. o.	3MON	Slovakia
13	CATALINK LIMITED	CTL	Cyprus
14	SYNTHESIS CENTER FOR RESEARCH AND EDUCATION LIMITED	SYNC	Cyprus
15	EXPERT SYSTEM SPA	EAI	Italy
16	ITTI SP ZOO	ITTI	Poland
17	Venaka Treleaf GbR	VTG	Germany
18	MASSIVE DYNAMIC SWEDEN AB	MDS	Sweden
19	FONDAZIONE CENTRO EURO-MEDITERRANEOSUI CAMBIAMENTI CLIMATICI	CMCC F	Italy
20	EXUS SOFTWARE MONOPROSOPI ETAIRIA PERIORISMENIS EVTHINIS	EXUS	Greece
21	RINIGARD DOO ZA USLUGE	RINI	Croatia
22	Micro Digital d.o.o.	MD	Croatia
23	POLITECHNIKA WARSZAWSKA	WUT	Poland
24	HOEGSKOLAN I BORAS	HB	Sweden
25	GEOPONIKO PANEPISTIMION ATHINON	AUA	Greece
26	ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS	CERTH	Greece
27	PANEPISTIMIO THESSALIAS	UTH	Greece
28	ASSOCIACAO DO INSTITUTO SUPERIOR TECNICO PARA A INVESTIGACAO E DESENVOLVIMENTO	IST	Portugal
29	VELEUCILISTE VELIKA GORICA	UASVG	Croatia

No	Partner Name	Short name	Country
30	USTAV INFORMATIKY, SLOVENSKA AKADEMIA VIED	UISAV	Slovakia
31	POMPIERS DE L'URGENCE INTERNATIONALE	PUI	France
32	THE MAIN SCHOOL OF FIRE SERVICE	SGPS	Poland
33	ASSET - Agenzia regionale Strategica per lo Sviluppo Ecosostenibile del Territorio	ASSET	Italy
34	LETS ITALIA srls	LETS	Italy
35	Parco Naturale Regionale di Tepilora	PNRT	Italy
36	FUNDATIA PENTRU SMURD	SMURD	Romania
37	Romanian Forestry Association - ASFOR	ASFOR	Romania
38	KENTRO MELETON ASFALEIAS	KEMEA	Greece
39	ELLINIKI OMADA DIASOSIS SOMATEIO	HRT	Greece
40	ARISTOTELIO PANEPISTIMIO THESSALONIKIS	AHEPA	Greece
41	Ospedale Israelitico	OIR	Italy
42	PERIFEREIA STEREAS ELLADAS	PSTE	Greece
43	HASICSKY ZACHRANNY SBOR MORAVSKOSLEZSKEHO KRAJE	FRB MSR	Czechia
44	Hrvatska vatrogasna zajednica	HVZ	Croatia
45	TECHNICKA UNIVERZITA VO ZVOLENE	TUZVO	Slovakia
46	Obcianske zdruzenie Plamen Badin	PLAMEN	Slovakia
47	Yayasan AMIKOM Yogyakarta	AMIKOM	Indonesia
48	COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION	CSIRO	Australia
50	FUNDACAO COORDENACAO DE PROJETOS PESQUISAS E ESTUDOS TECNOLOGICOS COPPETEC	COPPETEC	Brazil

Table of Contents

Executive Summary *17*

1 INTRODUCTION **18**

2 COMMUNICATION AND DISSEMINATION ACTIVITIES AND OUTPUTS **19**

2.1 EVENTS 19
2.1.1 Smart Life Festival in Modena, Italy *20*
2.1.2 Fire Ecology across Boundaries Conference in Florence, Italy *21*
2.1.3 PiConference 2022 ..... *22*
2.1.4 Crisis Management Days Workshop in Velika Gorica, Croatia *23*
2.1.5 European Research Days – Australia and New Zealand *24*
2.1.6 IX International Conference on Forest Fire Research in Coimbra, Portugal *25*
2.1.7 Joint Dissemination Workshop (EU Fire Projects United) *27*
2.1.8 IPITEX Conference 2023 – International Intellectual Property, Invention, Innovation and Technology Exhibition in Bangkok, Thailand *29*
2.1.9 LETS Educational Activities on SILVANUS in Modena, Italy *31*
2.1.10 Forest Pedagogy Workshop – Forest, Climate Change and Wildfires in Zvolen, Slovakia *32*
2.1.11 Scientific Evening for Students at the Technical University of Zvolen *32*
2.1.12 SILVANUS Educational Poster Exhibition in Rijeka, Croatia *33*
2.1.13 17th Professional Assembly of Firefighters in Opatija, Croatia *35*
2.1.14 Search and Rescue Conference in Nicosia, Cyprus *36*
2.1.15 Lessons and activities in Italian Schools organised by ASSET *37*
2.1.16 Regional Training Program for Upper Secondary Schools in Kymi, Greece *39*
2.1.17 DEFEA – Defence Exhibition Athens *41*
2.1.18 CUAV, UAV & Robotics Show in Čakovec, Croatia *42*
2.1.19 RISE-SD Security and Defence Conference in Rhodes, Greece *43*
2.1.20 ISCRAM Conference in Omaha, United States of America *47*
2.1.21 EU Green Week 2023 ..... *48*
2.1.22 SpliTech Conference in Bol, Croatia *50*
2.1.23 Weekend with the Slovak Academy of Sciences *51*
2.1.24 Round Table Discussion - Cooperation in Forest Fire Risk Management in Slovakia *51*
2.1.25 SILVANUS Open Day Forest Fires Workshop in Thessaloniki, Greece *52*
2.1.26 Green Deal Projects Support Office Webinar – SILVANUS as a Success Story *54*
2.1.27 SILVANUS at the MAIA Webinar on Wildfire and Forest Management *55*
2.1.28 SILVANUS Poster and Video Exhibition at the Firefighting Museum in Varaždin, Croatia *56*
2.1.29 International Workshop on Emerging Network Security in Benevento, Italy *57*
2.1.30 Fire Protection 2023 Conference in Ostrava, Czech Republic *58*
2.1.31 iProcureNet Workshop in Nicosia, Cyprus *59*
2.1.32 International Fair of Thessaloniki, Greece *60*
2.1.33 SafeAttica Conference in Athens, Greece *61*
2.2 NEWSLETTER 62
2.3 WEBSITE 66
2.4 SOCIAL MEDIA 71
2.5 TELEVISION 76
2.5.1 Croatian Television Reports from the Promotional Campaign and Pilot Exercise in Rijeka and Šapjane, Croatia *76*
2.5.2 Reports on the Slovak Pilot Exercise on Slovak National Television *78*
2.5.3 France 3 Nouvelle-AquitaineCoverage on SILVANUS and the Slovak Pilot Exercise *80*
2.6 PROMOTIONAL MATERIAL 81
2.7 PRESS RELEASES 84
2.8 SCIENTIFIC PUBLICATIONS 87
2.9 VIDEO 89

2.9.1 European Competence Offices (BCOs) Network Video on SILVANUS – A Holistic Digital Solution to Wildfire Management *89*
2.9.2 SILVANUS Promotional Video – For the Benefit of Forests and Humankind *90*
2.9.3 SILVANUS Video on the Slovak Pilot Exercise *90*

3 COLLABORATION WITH HORIZON 2020 COORDINATION SUPPORT ACTION, GREEN DEAL AND INNOVATION ACTION PROJECTS 92

3.1 EUFIREPROJECTSUNITED INITIATIVE 92
3.2 GREEN DEAL SUPPORT PROJECTS OFFICE 95

4 STAKEHOLDER ENGAGEMENT AND EXTERNAL ADVISORY BOARD UPDATE 97

5 CENTRE FOR ADAPTATION STRATEGIES AND DEVELOPMENT (CASD) – CURRENT STATUS 103

5.1 GOALS AND ACTIVITIES OF CASD 103
5.2 CONSULTATION ON GOVERNANCE STRUCTURE AND OPERATIONS OF CASD 104

6 EXPLOITATION PLAN FOR SILVANUS PLATFORM ACTIVITIES – SECOND STATUS REPORT 106

6.1 EXPLOITATION PLAN 106
6.2 EXPLOITABLE ITEMS 106
6.3 INDIVIDUAL EXPLOITATION 108
6.3.1 Individual exploitation plans *108*
6.4 JOINT EXPLOITATION 111
6.4.1 Intellectual property rights (IPR) *111*
6.4.2 Legal structure *112*
6.4.3 Exploitation agreement *112*
6.5 BUSINESS MODEL 113
6.6 MARKET ANALYSIS 115
6.6.1 Market definition *115*
6.6.2 Market Size, Growth Rates and Trends *116*
6.6.3 Supply side *116*
6.6.4 Demand side *118*
6.6.5 SWOT analysis *119*
6.7 NEXT STEPS 120

7 STANDARDS AND COMPLIANCE FOR INTEROPERABILITY OF SILVANUS PLATFORM – CURRENT STATUS 122

7.1 OPERATIONAL STANDARDS 122
7.2 TECHNICAL STANDARDS 123
7.3 NEXT STEPS 124

8 FUTURE COMMUNICATION AND DISSEMINATION ACTIVITIES AND OUTPUTS 125

8.1 EVENTS 125
8.1.1 Cloud-Edge Continuum Workshop (CEC 23) in Reykjavik, Iceland *125*
8.1.2 The 6th International Conference on Information and Communications Technology 2023 (ICOIACT) in Yogyakarta, Indonesia *125*
8.1.3 2nd Wildfire Project Management Clustering Event in Brussels, Belgium *125*
8.2 DISSEMINATION MATERIAL (NEWSLETTER, VIDEO) 125

9 CONCLUSION 126

10 REFERENCES 128

11 ANNEXES 129

11.1 ANNEX I – EXPLOITATION FICHES 129
11.1.1 UP1 - AR/VR training toolkit for trainers *129*
11.1.2 UP2 - Fire danger tool *132*

11.1.3 UP3 - Fire detection based on social sensing *134*
11.1.4 UP4 - Fire detection from IoT devices *138*
11.1.5 UP5 - Fire inspection using UAVs and UGVs *142*
11.1.6 UP6 - Fire spread forecast *144*
11.1.7 UP7 - Biodiversity profile mobile application *146*
11.1.8 UP8 - Citizen's engagement programme using mobile app *149*
11.2 ANNEX II – INDIVIDUAL EXPLOITATION PLANS 152
11.2.1 Partner No 2 - ZANASI ALESSANDRO SRL (Z&P) *153*
11.2.2 Partner No 3 - INTRASOFT INTERNATIONAL SA (INTRA) *154*
11.2.3 Partner No 6 - ATOS IT SOLUTIONS AND SERVICES IBERIA SL (ATOS IT) *156*
11.2.4 Partner No 7 - EMC INFORMATION SYSTEMS INTERNATIONAL (DELL) *157*
11.2.5 Partner No 8 - SOFTWARE IMAGINATION & VISION SRL (SIMAVI) *159*
11.2.6 Partner No 9 - CNET CENTRE FOR NEW ENERGY TECHNOLOGIES SA (EDP) *162*
11.2.7 Partner No 10 - ADP VALOR - SERVIÇOS AMBIENTAIS, S.A. (ADP) *165*
11.2.8 Partner No 11 - TERRAPRIMA - SERVICOS AMBIENTAIS SOCIEDADE UNIPESSOAL LDA (TP) *168*
11.2.9 Partner No 12 – 3MON, S.R.O. (3MON) *171*
11.2.10 Partner No 13 - CATALINK LIMITED (CTL) *173*
11.2.11 Partner No 15 - EXPERT.AI S.P.A. (EAI) *175*
11.2.12 Partner No 16 - ITTI SP ZOO (ITTI) *177*
11.2.13 Partner No 17 - IZQUIERDO/PIATRIK GBR (VMG) *178*
11.2.14 Partner No 18 - MASSIVE DYNAMIC SWEDEN AB (MDS) *180*
11.2.15 Partner No 19 - FONDAZIONE CENTRO EURO-MEDITERRANEOSUI CAMBIAMENTI CLIMATICI (CMCC F) *181*
11.2.16 Partner No 20 - EXUS SOFTWARE MONOPROSOPI ETAIRIA PERIORISMENIS EVTHINIS (EXUS) *186*
11.2.17 Partner No 21 - RINIGARD DOO ZA USLUGE (RINI) *188*
11.2.18 Partner No 22 - MICRO DIGITAL DOO ZA INFORMACIJSKE TEHNOLOGIJE (MD) *189*
11.2.19 Partner No 23 - POLITECHNIKA WARSZAWSKA (WUT) *190*
11.2.20 Partner No 24 - HOEGSKOLAN I BORAS (HB) *191*
11.2.21 Partner No 25 - GEOPONIKO PANEPISTIMION ATHINON (AUA) *194*
11.2.22 Partner No 26 - ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS (CERTH) *199*
11.2.23 Partner No 27 - PANEPISTIMIO THESSALIAS (UTH) *201*
11.2.24 Partner No 28 - ASSOCIACAO DO INSTITUTO SUPERIOR TECNICO PARA A INVESTIGACAO E DESENVOLVIMENTO (IST) *202*
11.2.25 Partner No 29 - VELEUCILISTE VELIKA GORICA (UASVG) *204*
11.2.26 Partner No 31 - POMPIERS DE L'URGENCE INTERNATIONALE (PUI) *206*
11.2.27 Partner No 32 - THE MAIN SCHOOL OF FIRE SERVICE (SGSP) *208*
11.2.28 Partner No 34 - LETS ITALIA SRLS (LETS) *210*
11.2.29 Partner No 37 - ASOCIATIA FORESTIERILOR DIN ROMANIA ASFOR (ASFOR) *211*
11.2.30 Partner No 38 - KENTRO MELETON ASFALEIAS (KEMEA) *213*
11.2.31 Partner No 39 - ELLINIKI OMADA DIASOSIS SOMATEIO (HRT) *216*
11.2.32 Partner No 42 - PERIFEREIA STEREAS ELLADAS (PSTE) *218*
11.2.33 Partner No 43 - HASICSKY ZACHRANNY SBOR MORAVSKOSLEZSKEHO KRAJE (FRS MB) *222*
11.2.34 Partner No 45 - TECHNICKA UNIVERZITA VO ZVOLENE (TUZVO) *223*
11.2.35 Partner No 46 - OBCIANSKE ZDRUZENIE PLAMEN BADIN (Plamen) *225*
11.2.36 Partner No 47 - YAYASAN AMIKOM YOGYAKARTA (AMIKOM) *226*
11.2.37 Partner No 48 - COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION (CSIRO) *228*
11.2.38 Partner No 49 - UNIVERSIDADE FEDERAL DO RIO DE JANEIRO (UFRJ) *230*
11.3 ANNEX III – IPR AGREEMENT 233

Index of Figures

Figure 1 Excerpt from the Smart Life Festival Presentation 21
Figure 2 SILVANUS project coordinator Michele Corleto with the wildfire management project team in Florence, Italy at the Fire Ecology Across Boundaries Conference 22
Figure 3 SILVANUS presented at the PiConference 2022 23
Figure 4 Jana Miriovsky and Marija Dolores Rotim from University of Applied Sciences Velika Gorica presenting SILVANUS 24
Figure 5 European Research Days - Australia and New Zealand Announcement featuring SILVANUS 25
Figure 6 SILVANUS project coordinator Michele Corleto and technical manager Krishna Chandramouli presenting the project at the International Forest Fire Research Conference in Coimbra, Portugal 26
Figure 7 SILVANUS flyer and the introduction video at the ICFFR in Coimbra 27
Figure 8 Joint Dissemination Workshop (EU Fire Projects United) Announcement, designed by Firelogue 28
Figure 9 Joint Dissemination Workshop by EU Fire Projects United 29
Figure 10 Prof. Dr. Michał Szota from SGSP receiving the Gold Award and the Best Invention Award for SILVANUS at the IPITEX 2023 30
Figure 11 THE IFIA Gold Medal Best Invention Award 30
Figure 12 SILVANUS Consortium member LETS presenting SILVANUS 31
Figure 13 Prof. Andrea Majlingova from TUZVO explaining SILVANUS to pupils from Slovakia 32
Figure 14 The invitation to the Students Evening in Zvolen, Slovakia 33
Figure 15 SILVANUS Poster Exhibition at the main central street of Rijeka, Croatia 34
Figure 16 Mayor of Rijeka Marko Filipović introducing and opening the SILVANUS exhibition 34
Figure 17 Example of a SILVANUS poster exhibited in Rijeka 35
Figure 18 Representatives of the Primorje-Gorski Kotar County Firefighting Association presenting activities, including SILVANUS 36
Figure 19 Krishna Chandramouli presenting SILVANUS at the Search and Rescue Conference 36
Figure 20 SILVANUS Educational Programme in the region of Apulia, Italy 38
Figure 21 Student fire prevention exercise in Gargano Park area, Apulia, Italy 38
Figure 22 ASSET teaching SILVANUS outputs to students in Apulia region in June 2023 39
Figure 23 SILVANUS partners PSTE and KEMEA at the Hazard Training Programme in Kymi, Greece 40
Figure 24 Attendees reading the SILVANUS citizen engagement posters 41
Figure 25 SILVANUS team member Georgios Sakkas from KEMEA presenting SILVANUS at the DEFEA Exhibition 42
Figure 26 Dr. Krishna Chandramouli presenting SILVANUS at CUAV Workshop 43
Figure 27 Lovorko Marić, SILVANUS Dissemination Manager, presenting SILVANUS at RISE-SD 44
Figure 28 Nikolaos Kalapodis from KEMEA presenting wildfire policies at RISE-SD 44
Figure 29 Konstantinos Demestichas from AUA presenting wildfire resilience at RISE-SD 45
Figure 30 SILVANUS Booth at the RISE-SD Conference, featuring the roll-up banner, flyers, posters and the video presentations from pilot exercises 46
Figure 31 The Wildfire Management Innovation and Polciies Workshop at RISE-SD 47
Figure 32 SILVANUS presented at the ISCRAM 2023 Conference 48
Figure 33 Željko Cebin from HVZ presenting the Croatian pilot exercise at EU Green Week 2023 49
Figure 34 The SILVANUS Green Week Webinar 2023, available on SILVANUS YouTube Channel 49
Figure 35 Georgia Christodoulou from Catalink Ltd presenting SILVANUS at SpliTech Conference 2023 50
Figure 36 SILVANUS Presented at the Weekend with the Slovak Academy of Sciences 51
Figure 37 Presentation of the SILVANUS project for the Core Group of stakeholders involved in the “Round Table” discussion in the 1st phase 52
Figure 38 The Open Day Forest Fires Workshop in Thessaloniki, Greece 53
Figure 39 Iosif Vourvachis from HRT giving an interview at the Open Day Forest Fires Workshop 54
Figure 40 SILVANUS as a Success Story at the GDSO Webinar 55
Figure 41 SILVANUS Presented at the MAIA Webinar 56

Figure 42 The SILVANUS poster and video exhibition at the Firefighting Museum in Varaždin, Croatia 57
Figure 43 Opening of the SILVANUS Exhibition in Varaždin, Croatia 57
Figure 44 Natan Orzechowski from WUT presenting SILVANUS at ARES 2023.....58
Figure 45 SILVANUS Project Representatives at the Fire Protection 2023 Conference in Ostrava 59
Figure 46 Andrea Majlingova from TUZVO presenting SILVANUS at the iProcureNet Workshop.....60
Figure 47 Dr. Nikolaos Kalapodis from KEMEA presenting SILVANUS at the International Fair of Thessaloniki, Greece 61
Figure 48 Aristeidis Bozas from CERTH presenting SILVANUS at the SafeAttica Conference.....62
Figure 49 The 2nd SILVANUS Newsletter released in October 2022 63
Figure 50 3rd SILVANUS Newsletter published in December 2022.....64
Figure 51 4th SILVANUS Newsletter published in May 2023 65
Figure 52 The 5th SILVANUS Newsletter from September 2023 66
Figure 53 Opening Video of the SILVANUS website, with the fire turning into the green SILVANUS logo...67
Figure 54 SILVANUS logo and title at the end of the video.....67
Figure 55 The SILVANUS homepage is emphasising the role of citizen engagement 67
Figure 56 Example of a News Article on the SILVANUS Website 68
Figure 57 User Product Page on SILVANUS Website.....69
Figure 58 Number of Users visiting SILVANUS Website from October 2022 to September 2023 (per Google Analytics) 70
Figure 59 Views of Individual Pages on SILVANUS Website.....70
Figure 60 Users of SILVANUS Website per Country from October 2022 to September 2023 71
Figure 61 User Acquisition in October 2022 - September 2023 Period 71
Figure 62 Examples of Citizen Engagement Posters on SILVANUS LinkedIn Account.....72
Figure 63 SILVANUS Greeting Card for World Environment Day 73
Figure 64 An example of SILVANUS LinkedIn Post 73
Figure 65 SILVANUS LinkedIn Visitor Metrics from October 2022 to September 2023.....74
Figure 66 SILVANUS LinkedIn Account Visitor Demographics.....75
Figure 67 SILVANUS Project Twitter Activity.....76
Figure 68 Croatian National Television Coverage of SILVANUS Exhibition in Rijeka.....77
Figure 69 Nikica Tramontana from Croatian Firefighting Association presenting the SILVANUS Pilot Exercise 77
Figure 70 Andrea Majlingova from TUZVO explaining SILVANUS on WAT Programme on RTVS 78
Figure 71 Slovak SILVANUS Team explaining the project goals before the Slovak Pilot Exercise.....79
Figure 72 Andrea Majlingova interviewed about SILVANUS on the RTVS Talk Show Experiment.....79
Figure 73 Report on the Slovak Pilot Exercise on RTVS Talk Show Experiment.....80
Figure 74 Zoltan Balogh from UISAV explaining SILVANUS Project on the RTVS Talk Show Experiment 80
Figure 75 Excerpt from the France 3 Video Coverage on the Slovak Pilot Exercise.....81
Figure 76 The SILVANUS Flyer 82
Figure 77 SILVANUS Roll-Up Banner.....83
Figure 78 Press Article on SILVANUS Poster Exhibition in Rijeka, Croatia (Croatian Radio and Television) .84
Figure 79 Press Article about the Croatian SILVANUS Pilot Exercise (Ps-portal.eu) 84
Figure 80 The OBCT Article on the SILVANUS Pilot Exercise in Croatia - "Croatia shows how to deal with wildfires".....85
Figure 81 Press Article on the Slovak Pilot Exercise 86
Figure 82 Press Article on SILVANUS for France 3 Nouvelle Aquitaine.....86
Figure 83 Press Article on the SILVANUS Exhibition in Varaždin, Croatia 87
Figure 84 SILVANUS - A Holistic Digital Solution to Wildfire Management Video 89
Figure 85 Excerpt from the SILVANUS Promotional Video.....90
Figure 86 SILVANUS Promotional Video - For the Benefit of Forests and Humankind 90
Figure 87 Excerpt from the SILVANUS Slovak Pilot Video 91
Figure 88 Title Page of the EUFireProjectsUnited Joint Newsletter.....92
Figure 89 International Firefighters Day Social Media Campaign Poster developed by Firelogue.....93
Figure 90 Social Media Campaign Poster for Happy Environment Day developed by Firelogue.....93

Figure 91 SILVANUS Section at the EUFireProjectsUnited ICFFR Video 94
Figure 92 SILVANUS Coordinator Michele Corleto presenting the project in Coimbra, Portugal 94
Figure 93 Excerpt from the GDSO video on SILVANUS 96
Figure 94 SILVANUS External Stakeholders Divided by Target Groups 98
Figure 95 External Stakeholders of SILVANUS Per Influence and Interest 99
Figure 96 SILVANUS Stakeholders according to the Level of Relationship 99
Figure 97 Number of External Stakeholders Per Sector 100
Figure 98 SILVANUS External Stakeholders per Country of Origin 101
Figure 99 Number of External Stakeholders per Main Area of Action 101
Figure 100 The EAB session at the SILVANUS GA Meeting in Athens - Andy Elliott from WildfireTAC Addressing the Audience 102
Figure 101 SILVANUS exploitation and business strategy 106
Figure 102 SILVANUS UP1 exploitation fiche 108
Figure 103 Business model Canvas methodology 113
Figure 104 Revised SILVANUS market SWOT analysis 120

Index of Tables

Table 1 List of SILVANUS Events in the second year of the project 19
Table 2 Number of Stakeholders Per Country of Origin 100
Table 3 SILVANUS exploitable results 107
Table 4 SILVANUS MVPs & User Products 107
Table 5 Individual Exploitation Plan of 3MON (example) 110
Table 6 IPR distribution for MVPs up to M24 111
Table 7 Analysis of competition for SILVANUS User Products 116
Table 8 Customer segmentation per SILVANUS User Product 119
Table 9 File Types Supported within SILVANUS Platform 123
Table 10 Interchange Protocols Used by SILVANUS Platform 124
Table 11 Partners that provided their Individual Exploitation Plans 152

Executive Summary

The second annual report on SILVANUS dissemination activities summarizes all communication, dissemination and stakeholder engagement actions between October 2022 and September 2023. SILVANUS was presented at 31 international events during this period (webinars, workshops, exhibitions, school and university lectures, festivals) on four continents with diverse stakeholder pools. All events are explained in detail with accompanying photographs and presentation excerpts. There were more than 4000 stakeholders and citizens directly attending these events.

Visual depictions and updates on the development of communication and dissemination material are demonstrated. Upgrades of website, social media and newsletters are described with an emphasis on knowledge-sharing content. While SILVANUS was focused in its first year on introducing the project's mission and objectives, the second year was oriented towards project results, i.e. the description of user product development and conducted pilot exercises. This is reflected in the evolution and increase of dissemination tools and activities. Television appearances, news coverage of pilot exercises, and press releases have increased significantly, as well as scientific publications, which summarize the significant contribution of SILVANUS to the scientific community. The citizen engagement programme, realised through educational poster exhibitions both live and on social media, is depicted as one of the most important dissemination outputs. Current status of all dissemination activities is compared with the Key Performance Indicators set in the Grant Agreement.

The Deliverable continues with a summary of joint activities with the Coordination and Support Action project Firelogue, Innovation Actions (TREEADS and FIRE-RES) and other wildfire management projects (SAFERS and FirEUrisk) within the EU Fire Projects United initiative, which resulted in a fruitful collaboration of common information campaigns, joint workshops, and videos.

The project's stakeholder engagement methodology is analysed by looking at the most important external stakeholders and how they are divided by stakeholder target group, level of interest and influence, country of origin, and relationship to the consortium. This gives an insight into the selection process for the Sustainable and Resilient Forest Working Groups, which will serve as an extension of the External Advisory Board. The relationship and the feedback received from the EAB members are described.

The comprehensive exploitation plan of the project is elaborated in detail, with an emphasis on data collection from the individual partner exploitation plans, user product exploitation fiches, and intellectual property rights agreements. Business model creation and market analysis to identify the exploitable aspects of the SILVANUS platform will be the next steps. An analysisof international standards to ensure the interoperability of SILVANUS outputs follow. The potential longevity of the project results is encapsulated through the summary of the current status of Centre for Adaptation Strategies and Development. The management board of CASD has been established and a task force has been convened to ensure a viable business and management plan, which will create a consulting entity that will go far beyond the duration of the project to disseminate SILVANUS outputs and share wildfire management expertise.

The Deliverable concludes with an outlook at future dissemination events and a brief explanation of the evolving strategy to ensure trust and further cooperation with the most important stakeholders and citizens, whose input and interaction will be essential in the long-term successful implementation of the SILVANUS platform.

1 Introduction

Deliverable 10.3 focuses on the summary of all SILVANUS project communication and dissemination activities in the second year of the project – between months 13 and 24 (October 2022 – September 2023), along with an overview of SILVANUS platform exploitation strategies, analysis of standards and compliance for the interoperability of SILVANUS platform, and the plan for establishing the Centre for Adaptation Strategies and Development (CASD).

In the second year of the project, SILVANUS has slowly but surely shifted its dissemination strategy from an awareness-raising to knowledge-sharing phase. As the first year focused more on introducing the objectives of the project and offered a general overview and timeline of their implementation, the second year emphasised the evolution of the project's platform, in particular through the introduction of SILVANUS platform user products and pilot exercises.

During the second year of the project, SILVANUS has further expanded its stakeholder pool, informing the stakeholders and citizens about the advancement of the SILVANUS platform through a series of promotional campaigns, both virtually (via website and social media updates), and live promotional campaigns.

Promotional and educational campaigns for the project were organised to coincide with the SILVANUS pilot exercises as part of the prevention and preparedness phase. The project was presented at numerous events (workshops, webinars, exhibitions, conferences, television interviews), where objectives and the latest updates on the development of the platform were presented. This was supported during the 12-month period by the release of four newsletters and additional promotional material such as videos, posters, and flyers, along with regular updates on the project's website and social media accounts. The number of joint scientific publications has been steadily increasing. The External Advisory Board was providing the project with constructive feedback. Collaboration with Firelogue, the Coordination and Support Action project, and the other Horizon-funded wildfire management projects (not just restricted to Innovation Actions TREEADS and FIRE-RES but also to other WFRM projects such as SAFERS and FirEUrisk) has further deepened and provided a blueprint for future synergy strategies and the creation of joint key messages.

SILVANUS was introduced to a much larger audience by the local, regional and national television, radio and news coverage of pilot exercises and live promotional campaigns in Croatia, Slovakia and France. Tens of thousands of viewers were introduced to the project in this way. The social media accounts are increasing the number of followers and the level of their engagement.

The structure of the Deliverable follows a similar one as in the previous Deliverables of Work Package 10. An overview of all communication and dissemination events is followed by a summary of collaboration activities between SILVANUS and the other Horizon-funded wildfire management projects. Stakeholder engagement strategies are elaborated on and summarized in the following chapter. Updates on the development and creation of the Centre for Adaptation Strategies and Development, the global think-tank which will provide consultancies on the SILVANUS project results and wildfire management beyond the duration of the project, are described in Chapter 5. The current status of SILVANUS exploitation plan is described in Chapter 6. The analysis of the interoperability of SILVANUS platform through an overview of standards and compliance is demonstrated in Chapter 7. The overall conclusion provides an outlook at future activities, especially in the third year of the project, and provides a general summary of previous activities and upcoming opportunities for an even more successful dissemination of project outputs and outcomes.

2 Communication and Dissemination Activities and Outputs

2.1 Events

SILVANUS continued more actively with communication and dissemination activities in its second year, with an emphasis on the educational and promotional campaigns to coincide with the pilot exercises as part of the prevention and preparedness phase (Phase A). The consortium has continued with presenting SILVANUS at diverse events all over the globe. The focus of presentations in the second year was on showing the platform user products, their current development, and on depicting the results of the pilot exercises conducted during this period. The following chapter summarizes the dissemination events from October 2022 to September 2023.

Table 1 List of SILVANUS Events in the second year of the project

	Event Name	Date	Number of attendees
1	Smart Life Festival in Modena, Italy	September 30th, 2022	30
2	Fire Ecology Across Boundaries Conference in Florence, Italy	October 4th – 6th, 2022	40
3	PiConference	October 22nd, 2022	20
4	Crisis Management Days in Velika Gorica, Croatia	October 24th, 2022	29
5	European Research Days – Australia and New Zealand	November 9th, 2022	30
6	International Conference on Forest Fire Research in Coimbra, Portugal	November 14th – 16th, 2022	150
7	Joint Dissemination Workshop	January 23rd, 2023	60
8	IPITEX Conference in Bangkok, Thailand	February 8th, 2023	300
9	LETS Educational Activities on SILVANUS in Modena, Italy	June 2022 - February 2023	120
10	Forest Pedagogy Workshop in Zvolen, Slovakia	February 9th, 2023	30
11	Scientific Evening for Students in Zvolen, Slovakia	March 21st, 2023	30
12	SILVANUS Educational Poster Exhibition in Rijeka, Croatia	April 3rd – 12th, 2023	5000
13	17th Professional Assembly of Firefighters in Opatija, Croatia	April 12th, 2023	100
14	Search and Rescue Conference in Nicosia, Cyprus	April 20th, 2023	50
15	Lessons and Activities in Italian Schools organised by ASSET	May – June 2023	240
16	Regional Training Programme for Upper Secondary Schools in Kymi, Greece	May 7th, 2023	40
17	DEFEA – Defence Exhibition Athens, Greece	May 9th, 2023	2000
18	CUAV, UAV & Robotics Show in Čakovec, Croatia	May 26th, 2023	30
19	RISE-SD Security and Defence Conference in Rhodes, Greece	May 29th, 2023	130
20	ISCRAM Conference in Omaha, United States of America	May 29th, 2023	60
21	EU Green Week 2023	June 6th, 2023	50

22	SpliTech Conference in Bol, Croatia	June 22nd, 2023	15
23	Weekend with the Slovak Academy of Sciences	June 23rd, 2023	120
24	Round Table Discussion - Cooperation in Forest Fire Risk Management in Slovakia	June 27th, 2023	12
25	SILVANUS Open Day Forest Fires Workshop in Thessaloniki, Greece	June 28th, 2023	95
26	Green Deal Projects Support Office Webinar – SILVANUS as a Success Story	July 12th, 2023	50
27	MAIA Webinar on Wildfire and Forest Management	July 31st, 2023	20
28	SILVANUS Poster and Video Exhibition at the Firefighting Museum in Varaždin, Croatia	August 19th, 2023	30
29	International Workshop on Emerging Network Security in Benevento, Italy	August 29th, 2023	50
30	Fire Protection 2023 Conference, Ostrava, Czech Republic	September 6th and 7th, 2023	150
31	iProcureNet Workshop in Nicosia, Cyprus	September 12th, 2023	50
32	87th Thessaloniki International Fair, Greece	September 12th, 2023	200
33	SafeAttica Conference in Athens, Greece	September 27th, 2023	30

As seen in Table 1, SILVANUS was presented at 33 events in the period between October 2022 and September 2023 in countries such as Italy, Greece, Croatia, Slovakia, Czech Republic and Cyprus, along with international countries such as USA, Thailand and Australia. The events can be divided into workshops, exhibitions and educational events, out of which the following were SILVANUS-organised:

- Workshops (EU Green Week, Thessaloniki Open Day Forest Fires Workshop, the Round Table in Zvolen, Slovakia)
- Exhibitions (Exhibition at the main central street in Rijeka, Croatia; Exhibition at the Firefighting Museum in Varaždin, Croatia)
- Educational Events (School campaigns in Apulia region and around the Gargano Park in Italy, Educational campaigns at the Technical University of Zvolen, Educational campaigns in Modena, Italy)

At least 9,361 people have attended these events from all identified stakeholder target groups, and more than 10,000 people were informed about SILVANUS through the television coverage of the Croatian exhibition of Rijeka. For the second year of the project and the introduction of the knowledge-sharing phase, these numbers show a basis that should only increase in the following year, as the SILVANUS platform is made known to and used by all the pertinent stakeholders and citizens.

2.1.1 Smart Life Festival in Modena, Italy

SILVANUS was presented at the Smart Life Festival in Modena on September 30th, 2022. This was a festival about digital culture, with the festival's theme being focused on "Umanesimo 5.0" (eng. Humanism 5.0). The focus of the festival is about how the technology can be helpful to the society and the environment. During the festival, several conferences, labs, talks, webinars and demonstrations were scheduled. SILVANUS was presented by Zanasi & Partners, whose representatives had the chance to participate at a webinar, where the project and the company were introduced, presenting the objective of SILVANUS and

its current state, focusing on the user products of the SILVANUS platform. The audience at the presentation amounted to 30 people, consisting of citizens, academia and SMEs.

Figure 1 Excerpt from the Smart Life Festival Presentation

2.1.2 Fire Ecology across Boundaries Conference in Florence, Italy

SILVANUS has participated at the Fire Ecology Across Boundaries Conference in Florence, Italy from 4th to 6th of October 2022. The Association for Fire Ecology (AFE) and Pau Costa Foundation (PCF) partnered with Regione Toscana and University of Florence to host a conference for diverse stakeholders involved in wildfire management. This conference was a meeting point for 220 international wildfire and landscape managers, scientists, policy makers, communicators and other representatives from national, regional and local organizations.

SILVANUS was presented by the coordinator Michele Corleto from Università Telematica Pegaso and Alexandre Lazarou from Zanasi & Partners in front of 40 attendees from academic, SME and EU project management background. Outputs of the project were discussed at the panel session and a roundtable on wildfire risk scenarios, addressing the expected Green Deal impacts related to building resilience into European landscapes.

The roundtable has been structured in 3 axes and these were the questions discussed:

- Axis 1: How (extreme) wildfire resilient landscapes (WRL) is approached from your project and which main challenges you see to achieve WRL in Europe? Do we approach differently resilience for normal versus extreme WF events?
- Axis 2: How may the expected impacts of Green Deal call serve to address and monitor resilient landscapes? Are the expected impacts realistic? How do you manage them within your projects? What other relevant outcomes from resilient landscapes could be considered?
- Axis 3: What needs you see at end-users' level to adopt wildfire resilient landscapes? Do you see conflicts in between wildfire disaster risk reduction strategies centred on fuel management (prevention) and other ecosystem services at landscape level? And how existing synergies could be enhanced across EU, national and regional policies?

The conference was also an opportunity to exchange ideas and propositions between the Horizon 2020 wildfire management projects and the Coordination and Support Action project Firelogue.

Figure 2 SILVANUS project coordinator Michele Corleto with the wildfire management project team in Florence, Italy at the Fire Ecology Across Boundaries Conference

2.1.3 PiConference 2022

SILVANUS was presented by the project coordinator Michele Corleto of Università Telematica Pegaso at the virtual PiConference on October 22nd, 2022. The presentation on the objectives and outputs of SILVANUS was made in front of 20 academic professors and PhD students of multidisciplinary areas in the economic, environmental, technological and legal sector. The theme of the conference was "Inclusive sustainability in Africa-Europe through dialogue and technology". The interconnectivity of the SILVANUS platform was emphasised – the interactive aspects of the platform, in particular the citizen engagement and biodiversity indexing mobile apps, were noted as a crucial aspect on how to make SILVANUS applicable and accessible in all parts of the world, promoting inclusivity and sustainability in the fight against extreme wildfire.

Figure 3 SILVANUS presented at the PiConference 2022

2.1.4 Crisis Management Days Workshop in Velika Gorica, Croatia

SILVANUS was presented on the 2nd day of the Crisis Management Days conference in Velika Gorica, Croatia, which took place on October 24th 2022, by representatives of the University of Applied Sciences Velika Gorica. The name of the workshop was "Crisis management development through EU-funded projects".

The aim of the workshop was to gather Croatian experts from the field of Crisis Management with experience in the implementation of EU-funded projects. The workshop was divided into three thematic units: Contemporary threats and new risks, Operational readiness and new technologies.

The SILVANUS project was presented during the first thematic unit - Contemporary threats and new risks by the representatives of the International Cooperation and Projects Department from the University of Applied Sciences Velika Gorica Jana Miriovsky, mag. philol. angl et russ. and Marija Dolores Rotim, mag. rel. int. et dipl.

The presentation consisted of general information about the project, work packages and activities, pilot demonstrations and what is expected as the final product – an integrated technological and information platform for wildfire management. The presentation was followed by a short discussion about the implementation of the Croatian pilot. There were 29 attendees present.

Besides representatives from the University of Applied Sciences Velika Gorica, participants in the thematic unit Contemporary threats and new risks were from RiniGARD (SILVANUS consortium partner), as well as Croatian Civil Protection Directorate, Ministry of the Interior.

In the thematic unit "Operational readiness", participants were from Dubrovnik-Neretva County, Croatian Civil Protection Directorate, Ministry of the Interior, Croatian Mountain Rescue Service and from the Croatian Red Cross.

In the thematic unit "New technologies", participants were from Zagreb County and the Croatian Crisis Management Association.

Presentations of each project were followed by brief discussions on the benefits and challenges in the project preparation, evaluation and implementation. The exchange of views and experiences provided a perfect opportunity for learning, as well as networking.

Figure 4 Jana Miriovsky and Marija Dolores Rotim from University of Applied Sciences Velika Gorica presenting SILVANUS

2.1.5 European Research Days – Australia and New Zealand

SILVANUS partner CSIRO made a presentation on SILVANUS as a success story of EU-Australia collaboration at the virtual event European Research Days – Australia and New Zealand, organised by European Commission's EURAXESS. The event took place on November 9th, 2022, in front of 50 attendees. The presentation was focused on the collaboration between European and Australian/New Zealand organisations. Paulo Borges from CSIRO gave a present overview of SILVANUS, with an emphasis on CSIRO's (as an Australian Organization) involvement in it, particularly on the development of ground robot technology, as well as collaboration with European partners.

Figure 5 European Research Days - Australia and New Zealand Announcement featuring SILVANUS

2.1.6 IX International Conference on Forest Fire Research in Coimbra, Portugal

The SILVANUS team, led by the project coordinator Michele Corleto and the technical manager Krishna Chandramouli, attended the IX International Conference for Forest Fire Research in Coimbra, Portugal, between 14th and 16th of November 2022. The conference was organised by Association for the Development of Aerodynamics (ADAI) and the University of Coimbra, while Horizon 2020 wildfire management projects Firelogue and FirEUrisk were event sponsors.

The presentation of SILVANUS was held at the European Research and Innovation Plenary Session on the 15th of November 2022 in front of a wide audience of wildfire management stakeholders and experts. There were approximately 150 attendees at the session, making it one of the biggest live audiences for a SILVANUS presentation until that point. The session was hosted by Nicolas Faivre from the European Commission.

Michele Corleto introduced the objectives and results of the project, while Krishna Chandramouli continued with a comprehensive outline of the technical framework of the project, describing the four lines of defence against extreme wildfire within the SILVANUS platform through the use of sensors, drones, robots and water cannons. This was followed by the description of methodology and the timeframe of trial periods, along with an overview of SILVANUS pilots in eleven countries on four continents. Stakeholders were invited to closely follow the project and to participate at pilot demonstrations.

The networking at the conference made it possible for SILVANUS to expand its increasing stakeholder pool and to acquire important feedback from fire experts to further advance the SILVANUS platform as the project slowly approaches the stage of pilot implementations.

The presentation was followed by a panel session with the Wildfire Risk Management Projects – FIRE-RES, TREEADS, FirEUrisk, FIRE-IN and Firelogue, where ideas about further cooperation between the projects were exchanged on how to maximise the complementary results in wildfire management between all projects. The discussion was revolving around the use of the individual outputs of projects – such as the FirEUrisk fuel map – to enhance and facilitate a more efficient implementation of other project results, e.g., the SILVANUS platform.

The SILVANUS flyer was distributed at the conference, and an EUFireProjectsUnited video was aired, which featured SILVANUS technical manager Krishna Chandramouli explaining the project's objectives.

A video, produced by Firelogue and filmed at the conference, was distributed on YouTube afterwards, which featured interviews with Michele Corleto, Krishna Chandramouli, and dissemination manager Lovorko Marić.

Figure 6 SILVANUS project coordinator Michele Corleto and technical manager Krishna Chandramouli presenting the project at the International Forest Fire Research Conference in Coimbra, Portugal

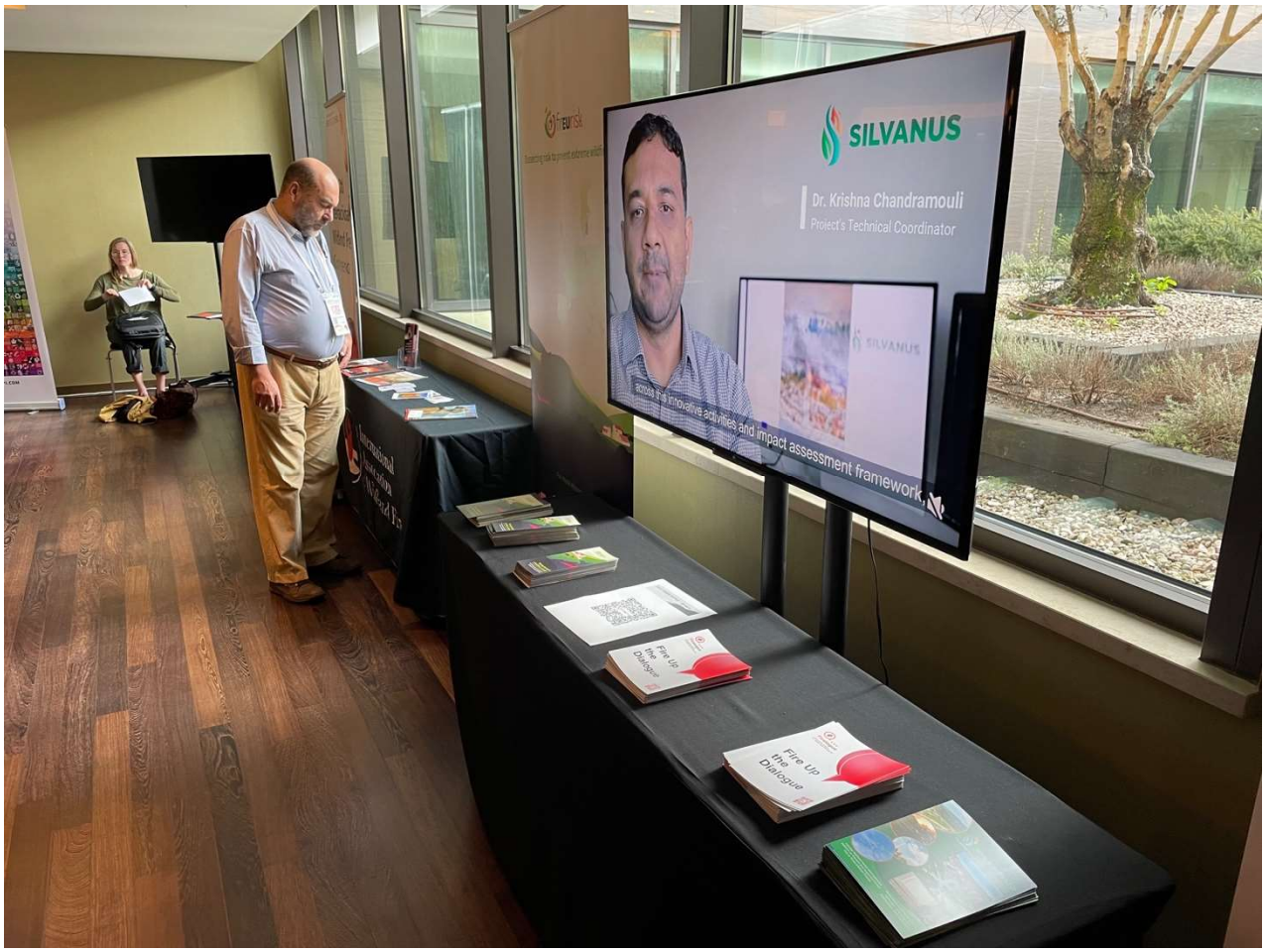


Figure 7 SILVANUS flyer and the introduction video at the ICFFR in Coimbra

2.1.7 Joint Dissemination Workshop (EU Fire Projects United)

The Joint Dissemination Workshop, organised by Firelogue and moderated by SILVANUS dissemination manager Lovorko Marić, was a virtual event that took place on 23rd of January 2023. The focus of the workshop was to present the main results and challenges faced by the EU-funded wildfire management projects (Firelogue, TREEADS, FIRE-RES, SAFERS, FirEUrisk, FIRE-IN, FireLinks).

The SILVANUS presentation was made by Lovorko Marić. It focused on a short summary of the main results for the first year of the project, focusing primarily on presenting the user products (AR/VR training toolkit, citizen engagement mobile application, fire danger risk assessment using earth observation data sources, fire prevention and awareness support mobile application, fire detection system based on social sensing, fire detection using IoT and on-site devices, fire spread forecast models, fire detection and inspection using drones and ground robots) and announcing the pilot implementation trial period, which took place between April and September 2023 (roughly between month 18 and month 24 of the project). Discussion points focused on synergies and overlaps with other wildfire prevention projects, on the potential common use of reliable datasets related to fire ignition and spread, and on future collaboration efforts. There were

approximately 60 attendees at the workshop, which featured experts and colleagues from the EU Fire Projects United consortia.

Figure 8 Joint Dissemination Workshop (EU Fire Projects United) Announcement, designed by Firelogue

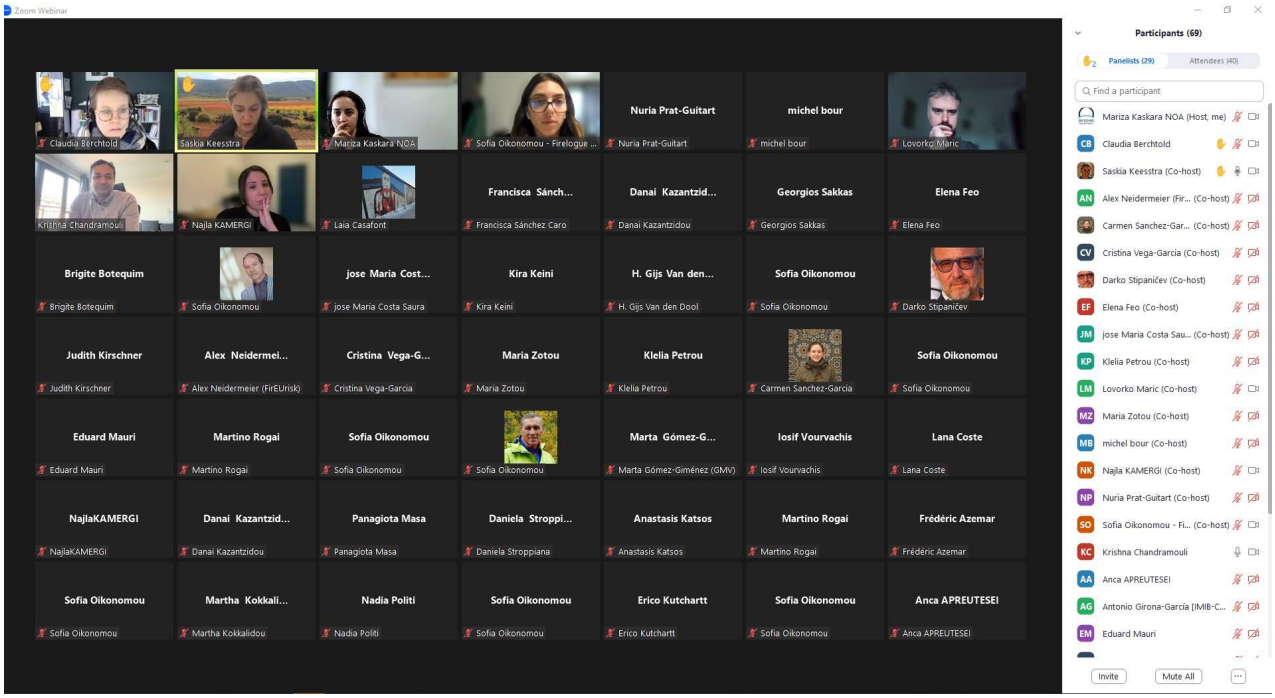


Figure 9 Joint Dissemination Workshop by EU Fire Projects United

2.1.8 *IPITEX Conference 2023 – International Intellectual Property, Invention, Innovation and Technology Exhibition in Bangkok, Thailand*

The SILVANUS consortium, presented by the consortium partner Main School of Fire Service (SGSP) from Poland, has received the Gold Medal and the IFIA Best Invention Award for the Integrated Technological and Information Platform at the IPITEx 2023 (International Intellectual Property, Invention, Innovation and Technology Exhibition, organised by the National Research Council of Thailand) in Bangkok, Thailand, on Thailand Inventors' Day 2023. The exhibition took place on February 2nd, 2023. It featured an audience of innovators, project executors, technology providers, decision makers and end-users, with more than 1,500 inventions exhibited from 30 countries.

The exhibition was an Innovation Event organised by the International Federation of Inventors' Association. The project was presented during the exhibition by SILVANUS partner Main School of Fire Service (SGSP), with an emphasis on SGSP's scope of work. SGSP was represented by Prof. Dr. Michał Szota, and the award was handed by the IFIA President Alireza Rastegar, in front of an audience of approximately 300 people.

Figure 10 Prof. Dr. Michał Szota from SGSP receiving the Gold Award and the Best Invention Award for SILVANUS at the IPITEX 2023

Figure 11 THE IFIA Gold Medal Best Invention Award

2.1.9 LETS Educational Activities on SILVANUS in Modena, Italy

During a period from June 2022 to February 2023, SILVANUS Consortium member LETS has conducted three educational activities to share knowledge about the project. These sessions were held at the LETS headquarters in Modena, Italy, or at the local fire brigade detachments. There were three ways in which the meetings were organised:

1. Expansion of firefighting training activities with an additional meeting to raise awareness of SILVANUS;
2. Organisation of real events with citizens in small groups in order to discuss the principles of SILVANUS and promote awareness;
3. Expansion of the coordination activities carried out between the LETS staff and the fire brigade aimed at broadening the knowledge of the SILVANUS project and exchanging ideas regarding the solutions proposed by the Consortium.

Figure 12 SILVANUS Consortium member LETS presenting SILVANUS

Over 120 citizens and rescuers attended the educational activities. SILVANUS was considered to be a great resource for providing the rescue network with effective technological support, capable of providing adequate responses to the emergencies that are now constantly arising within the forest areas scattered across the country.

2.1.10 Forest Pedagogy Workshop – Forest, Climate Change and Wildfires in Zvolen, Slovakia

The forest pedagogy workshop was organised at the Technical University of Zvolen, Slovakia, on February 2nd, 2023, in organisation of National Forest Centre, Centre for Knowledge Transfer and Forest Pedagogy.

The presentation on linkage between forest, climate change consequences and wildfires were presented and supplemented with information on SILVANUS project objectives and technology deployed. Brief information on Slovak Pilot was provided as well. The participants of the workshop were the pupils coming from 4 elementary schools in Central Slovakia: 2 schools from Zvolen, 1 from Pliesovce and 1 from Zvolenska Slatina. In total, 30 pupils attended the workshop.

Figure 13 Prof. Andrea Majlingova from TUZVO explaining SILVANUS to pupils from Slovakia

2.1.11 Scientific Evening for Students at the Technical University of Zvolen

The Technical University of Zvolen organised a lecture on "Lesy Slovenska ich reziliencia voči lesným požiarom / Slovak Forests and their Resilience to Wildfire", which was supplemented with discussion. The event took place on the occasion of the International Day of Forests, on the 21st of March 2023. This "Scientific Evening for Students" was a series of lectures for TUZVO students and IFSA Slovakia (International Student Forestry Association) members on selected topic and invited lectures. 30 students were introduced to SILVANUS project during this event.

Figure 14 The invitation to the Students Evening in Zvolen, Slovakia

2.1.12 SILVANUS Educational Poster Exhibition in Rijeka, Croatia

The SILVANUS educational poster exhibition took place on the main central pedestrian street of Korzo in Rijeka, Croatia, between 3rd and 12th of April 2023. The event was organised by SILVANUS partner Croatian Firefighting Association and was sponsored by the City of Rijeka. Rijeka is the third largest city in Croatia, its most important and biggest seaport, and the closest urban centre to the Training Centre Šapjane, which is the site of the Croatian pilot exercise. According to the 2021 Croatian Population Census, Rijeka had 108,622 inhabitants.

The exhibition featured 10 two-sided bilingual (Croatian and English) posters, focusing on:

- The main activities and objectives of SILVANUS
- Key message and advice for citizens in the fight against extreme wildfire
- Announcement of the citizen engagement mobile app
- Description of Croatian Firefighting Association activities within SILVANUS

The formal opening of the exhibition was led by the Mayor of Rijeka Marko Filipović, the Deputy Prefect of Primorje-Gorski Kotar County Vojko Braut, the Chief Firefighting Commander Slavko Tucaković, and the Primorje-Gorski Kotar County Firefighting Commander Mladen Šćulac. Interviews were given to the Croatian National Television and regional TV circuits. The interviews and the exhibition were featured that day on the Croatian Television's evening news. 30 invitees attended the opening of the exhibition.

Objectives of the project were discussed, along with the SILVANUS pilot exercise in the Training Centre of Šapjane, which took place 20 kilometres from the City of Rijeka on the 18th and 19th of April. This was the first promotional campaign to coincide with the SILVANUS pilot exercise, which introduced a number of stakeholders and citizens.

Since the exhibition was on the most visited central street of Rijeka and free and visible to all pedestrians, it is a conservative estimate that at least 5000 (up to 10,000) people were introduced to SILVANUS in this way (based on a percentage of the number of people passing through Korzo every day), not including the estimate of 100,000 to 200,000 people that have seen the television coverage in the Croatian media.

Figure 15 SILVANUS Poster Exhibition at the main central street of Rijeka, Croatia

Figure 16 Mayor of Rijeka Marko Filipović introducing and opening the SILVANUS exhibition

Figure 17 Example of a SILVANUS poster exhibited in Rijeka

2.1.13 17th Professional Assembly of Firefighters in Opatija, Croatia

Croatian Firefighting Association (HVZ) presented SILVANUS at the 17th Professional Assembly of Firefighters in Opatija, Croatia, on April 12th, 2023. The event was organised by the Primorje-Gorski Kotar firefighting association, which has also worked on the implementation of the SILVANUS pilot exercise at the Training Centre of Šapjane in Croatia on April 18th and 19th, 2023. This was a conference that brought together volunteer and professional firefighters, manufacturers and distributors of firefighting equipment, fire engineering experts, occupational safety experts and all other fire safety and protection experts. SILVANUS was presented with a number of posters that were also displayed in Rijeka (Chapter 2.1.12), and the roll-up poster. SILVANUS flyers were also distributed. There were 100 attendees present, and 30 attendees received the flyer.

Figure 18 Representatives of the Primorje-Gorski Kotar County Firefighting Association presenting activities, including SILVANUS

2.1.14 Search and Rescue Conference in Nicosia, Cyprus

Technical manager Krishna Chandramouli has presented SILVANUS at the Search and Rescue Conference in Nicosia, Cyprus, on the 20th of April 2023, in front of 50 attendees. The presentation was focused on the objectives of the project, the pilot exercises and the platform user products.

Figure 19 Krishna Chandramouli presenting SILVANUS at the Search and Rescue Conference

2.1.15 Lessons and activities in Italian Schools organised by ASSET

SILVANUS partner ASSET – Agency for Ecological and Sustainable Development for the Region of Apulia has organised in May 2023 awareness-raising activities aimed at second- and third-year students of secondary school, considered an adequate and particularly receptive target of topics covered. In particular, the activities in which the students were involved were:

- Frontal lessons aimed at learning the specifications relating to fire prevention. The course held during school hours, for a total of 2-3 hours approx. has been carried out in a total of 5-6 training meetings.
- Laboratory activities in the classroom for the construction of guides with "Good Practices" from to adopt in the prevention phase

The questions covered by a group of ASSET experts and Civil Protection can be summarized as follows:

- Guidelines of the SILVANUS project
- The Gargano Park area: climatic and environmental factors fuel models
- Basic concepts of prediction, prevention and active fight against forest fires
- The components of the forest fire prevention organization
- Description and implementation of land and air vehicles for extinguishing forest fires
- Spotting a fire and what to do in case of fire
- Self-protection concept: How do I recognize if I am in a forest fire risk area?

Citizen engagement posters and a SILVANUS brochure were distributed and around 240 students were present at the three sessions:

- 3rd May - Instituto Onnicomprensivo "P. G. Castelli" in Carpino (FG) - 40 students
- 18th May -Instituto Comprensivo "N. D'Apolito" of Cagnano Varano (FG) - 100 students
- 30th May -Instituto Comprensivo "P. Giannone" of Ischitella (FG) - 100 students

This is in line with the goal of the project where a total of 6 schools identified in the area surrounding the Gargano Park are involved in learning activities from May 2023 to October 2023.

Figure 20 SILVANUS Educational Programme in the region of Apulia, Italy

Figure 21 Student fire prevention exercise in Gargano Park area, Apulia, Italy

Activities continued with ASSET conducting an additional educational awareness-raising programme in Italy for the prevention, control, and recovery from forest fires in June 2023.

The ASSET working group, together with the Civil Protection volunteers conducted lectures together with practical activities, aimed at learning:

- The guidelines of the SILVANUS project
- The pilot area of the National Park Gargano (one of 12 SILVANUS pilot areas) together with its characteristic climatic and environmental factors
- Fuel models and the basic concepts of forecasting, preventing and actively fighting forest fires The production of a good practice guide to avoid, spot and fight them correctly.
- Education for the prevention of wildfires to a wide pool of citizens, with an emphasis on students, is a crucial component of the project.

Figure 22 ASSET teaching SILVANUS outputs to students in Apulia region in June 2023

2.1.16 Regional Training Program for Upper Secondary Schools in Kymi, Greece

SILVANUS partner PSTE, with the assistance of KEMEA, organised a regional training program (school community management and empowerment) on natural disaster preparedness and management in Kymi, Greece (region of Sterea Ellada) between 5th and 7th of May 2023. The event was conducted as part of the SILVANUS citizen engagement programme, as SILVANUS posters with key messages on wildfire prevention were distributed to attendees.

On the third day (May 7th), the training programme related to natural disasters was presented, where training exercises for earthquakes were carried out. The goal of the event was to train teachers of upper secondary schools for natural hazards. There were 40 attendees at the event. The training included:

- hazard understanding,
- self-protection measures and actions before, during, and after the event,
- demonstration of the earthquake suitcase, exercise for earthquakes and other natural hazard related events.

Since Evia Island is one of the areas that has suffered significant damage from the 2021 mega-fire, wildfires were discussed as one of the main topics. There was a great interest of the teachers on the SILVANUS citizen engagement programme, the flyers made a very good impression, while future similar activities in Evia schools are being planned.

Figure 23 SILVANUS partners PSTE and KEMEA at the Hazard Training Programme in Kymi, Greece

Figure 24 Attendees reading the SILVANUS citizen engagement posters

2.1.17 DEFEA – Defence Exhibition Athens

At the Metropolitan Expo in Athens, Greece, as part of the International Defence Exhibition, SILVANUS partner KEMEA presented a SILVANUS stand featuring a presentation and citizen engagement posters from 9th to 11th of May 2023.

DEFEA Exhibition is an international defence and security event that takes place every two years in Athens. Many technological providers across the world gather to exhibit their products on the defence, security and civil protection sector. Additionally, public organisations participate as well, especially from the Hellenic Government, the ministries, including first responders from Greece and other countries. KEMEA participated as an organisation of the public domain, and one of the projects presented was SILVANUS. It was stated that technologies used in SILVANUS are explicitly used for civil protection purposes only.

In addition, the first results of the Citizen Engagement Programme were also shared among the visitors. Feedback and impression form the visitor side as well as the Hellenic high officials was that SILVANUS is among the most interesting projects on civil protection and especially on preventing wildfires.

The audience was made up of first responders, technology providers (SMEs and industry), academia, IT business, armed forces, ministers of the Hellenic government, ambassadors and other high officials. Approximately 10,000 people visited the exhibition, and an estimate of 2,000 people have visited the stand.

Figure 25 SILVANUS team member Georgios Sakkas from KEMEA presenting SILVANUS at the DEFEA Exhibition

2.1.18 CUAV, UAV & Robotics Show in Čakovec, Croatia

SILVANUS partners Venaka TReLeaf and RiniGARD have attended the CUAV, UAV & ROBOTICS Show in Čakovec, Croatia on 26th of May 2023. Krishna Chandramouli has presented the project at the Robotics and Technologies session, with an emphasis on the innovative protection using UAV (unmanned aerial vehicle) and UGV (unmanned ground vehicle) technologies. The audience consisted of technology providers (SMEs, industry), public administration, energy and security sector. There were approximately 30 attendees at the SILVANUS presentation.

Figure 26 Dr. Krishna Chandramouli presenting SILVANUS at CUAV Workshop

2.1.19 RISE-SD Security and Defence Conference in Rhodes, Greece

SILVANUS was presented at the RISE-SD Security and Defence 2023 Conference in Rhodes, Greece, an important international event in the security and defence area, which included high-level representatives of the EU, governmental representatives, researchers, industry, practitioners, and European security and defence stakeholders. The conference hosted approximately 20 research and development projects concerning disaster and crisis management, critical infrastructure protection, border security and defence research. More than 200 participants from around EU and beyond joined he event to exchange ideas, present results and participate in live demos of technological solutions.

On the first day of the conference, on May 29th 2023, Lovorko Marić, the SILVANUS dissemination manager, presented a general overview of SILVANUS and its current status with a particular emphasis on the implemented pilot exercises in Croatia and Slovakia in April 2023, and on the user products of the SILVANUS platform.

Figure 27 Lovorko Marić, SILVANUS Dissemination Manager, presenting SILVANUS at RISE-SD

This was followed by a presentation by Nikolaos Kalapodis from KEMEA, who presented the EU sustainable forest management and wildfire policies and practices as part of the project's research.

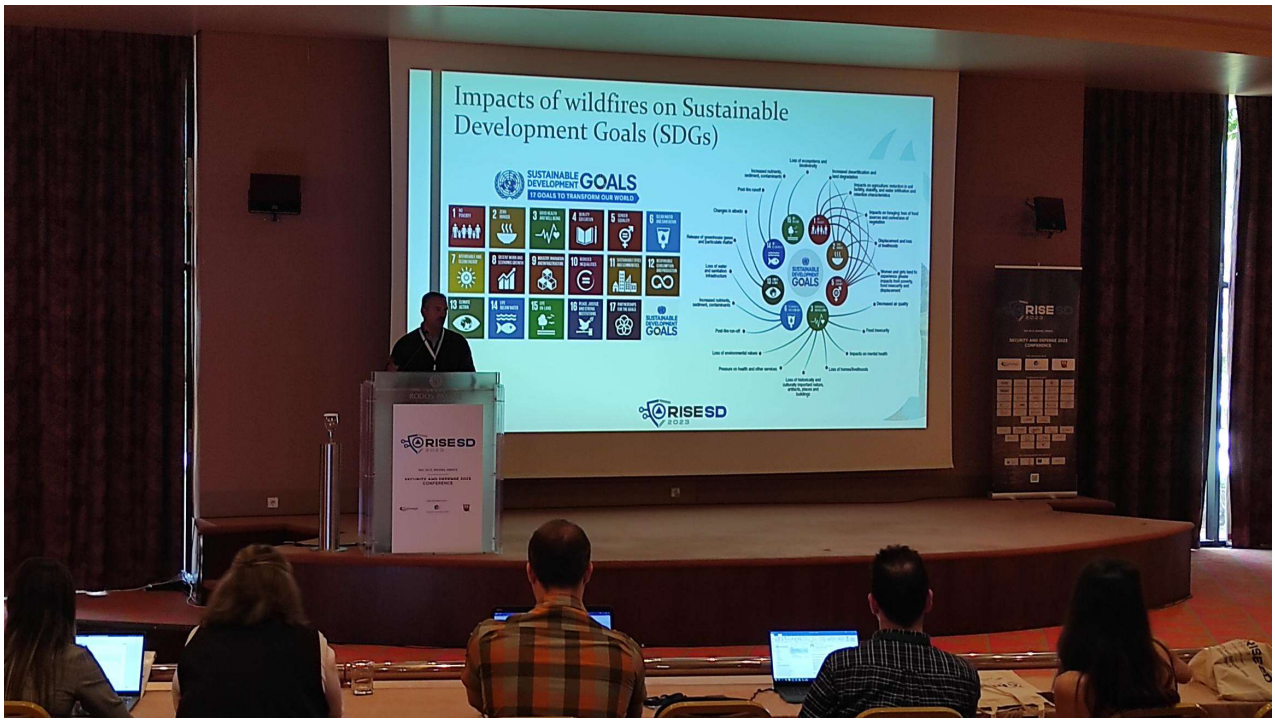


Figure 28 Nikolaos Kalapodis from KEMEA presenting wildfire policies at RISE-SD

Konstantinos Demestichas from the Agricultural University of Athens focused on describing the methods and technical approaches when measuring forest resilience against wildfire and climate change. The three presentations were watched by more than 100 attendees.

Figure 29 Konstantinos Demestichas from AUA presenting wildfire resilience at RISE-SD

The conference also featured a SILVANUS booth in the main foyer, with promotional video footage from the Croatian and Slovak pilots, the presentation of the citizen engagement app, along with dissemination material such as posters, flyers, and the roll-up banner. There were more than 50 flyers and posters distributed to attendees during the conference. In addition, more than 100 flyers were distributed through the official conference material (bags, etc.) to the registered participants.

Figure 30 SILVANUS Booth at the RISE-SD Conference, featuring the roll-up banner, flyers, posters and the video presentations from pilot exercises

On the second day of the conference at May 30th, SILVANUS was featured at the Wildfire Management Innovation and Policies workshop, consisting of three panels and moderated by George Eftychidis from Satways Ltd (one of the co-organisers of the conference) and Claudia Berchtold, the coordinator of Firelogue. There were approximately 30 attendees at the session.

Georgios Sakkas from KEMEA discussed the outputs of SILVANUS at two of the panels. The first panel focused on the holistic approach and integrated management of landscape wildfires. The aim was to provide a better understanding of the concepts and terms related to wildfire management used by both national authorities and the European Commission. The third panel was focused on the science and technology contribution to wildfire management, where innovative solutions – such as the SILVANUS platform – were discussed.

The second panel focused on the Directorate-General for European Civil Protection and Humanitarian Aid Operations Wildfire Prevention Action Plan, and it featured Andrea Majlingova from Technical University in Zvolen as part of the SILVANUS team, along with an appearance by Cristina Brailescu from DG-ECHO. The actions of the plan were discussed to use scientific know-how and research to explore new areas of wildfire prevention.

The panel also featured an appearance and contributions from Nicolas Faivre from European Research Executive Agency (REA).

The discussion between the SILVANUS representatives and partners of wildfire management projects Firelogue, FirEUrisk, SAFERS and TREEADS was fruitful, discussing on how the collaboration can

advance the effectiveness of technological solutions and the approach toward citizens in wildfire prevention.

Figure 31 The Wildfire Management Innovation and Polciies Workshop at RISE-SD

2.1.20 ISCRAM Conference in Omaha, United States of America

SILVANUS team members Zoltán Balogh and Emil Gatial from UISAV and Kayvan Yousefi Mojir from HB have presented the project and three scientific papers on May 29th 2023, at the 20th Annual Global Conference on Information Systems for Crisis Response and Management (ISCRAM 2023) in Omaha, United States of America, focusing on:

- Communication Protocol for using Non-traditional Information Sources between First Responders and Citizens during Wildfires
- Citizen Engagement in Wildfire Management: Needs, Challenges, Methods
- Framework Coordination of Drones Swarm for Wildfire Monitoring

This was a major joint scientific publication undertaking by the SILVANUS team, featuring partners from UISAV, HB, FINCONS, ITTI, TUZVO, RINI, VTG, 3MON and THALES. The papers were presented in front of an audience (including virtual) of 60 attendees. Stakeholders from the fields of academia and IT business were present, and SILVANUS had the opportunity to share its results to an international audience beyond the scope of the EU. The ISCRAM 2023 provided continuity for SILVANUS to be engaged in this particular stakeholder pool, since the project was also presented at the ISCRAM 2022.

Figure 32 SILVANUS presented at the ISCRAM 2023 Conference

2.1.21 EU Green Week 2023

SILVANUS has for the second time joined the EU Green Week initiative (after the webinar in 2022), with a workshop that focused on the results of SILVANUS at the approximate midpoint of the project. While the 2022 webinar was focused on awareness-raising, i.e. introducing the project's objectives, the 2023 webinar has initiated a knowledge-sharing phase to its audience of stakeholders and citizens.

The 2-hour webinar, which took place on June 6th at the University of Applied Sciences Velika Gorica (as a hybrid event), showed the following:

- the development progress of the SILVANUS platform with a detailed depiction of its technological components (user products),
- a report from the implementation of first two SILVANUS pilots in Croatia and Slovakia,
- a close look at the citizen engagement app,
- a comprehensive overview of the citizen engagement programme, featuring the poster promotional campaigns.

The project introduction was presented by Lovorko Marić, the platform description was made by Krishna Chandramouli, the description of the pilot exercise in Croatia was conveyed to the public by Željko Cebin from HVZ, and the Slovakian pilot exercise was summarized by Richard Rehak from 3MON. The citizen engagement programme was explained by Kayvan Yousefi Mojir from HB, and the app was demonstrated by Eleni Kotali from MDS.

Figure 33 Željko Cebin from HVZ presenting the Croatian pilot exercise at EU Green Week 2023

The event was co-organised and presented by SILVANUS partners UASVG, HVZ, RINI, MDS, HB, 3MON, VTG and MD. The recording of the webinar is available at the official SILVANUS YouTube channel.

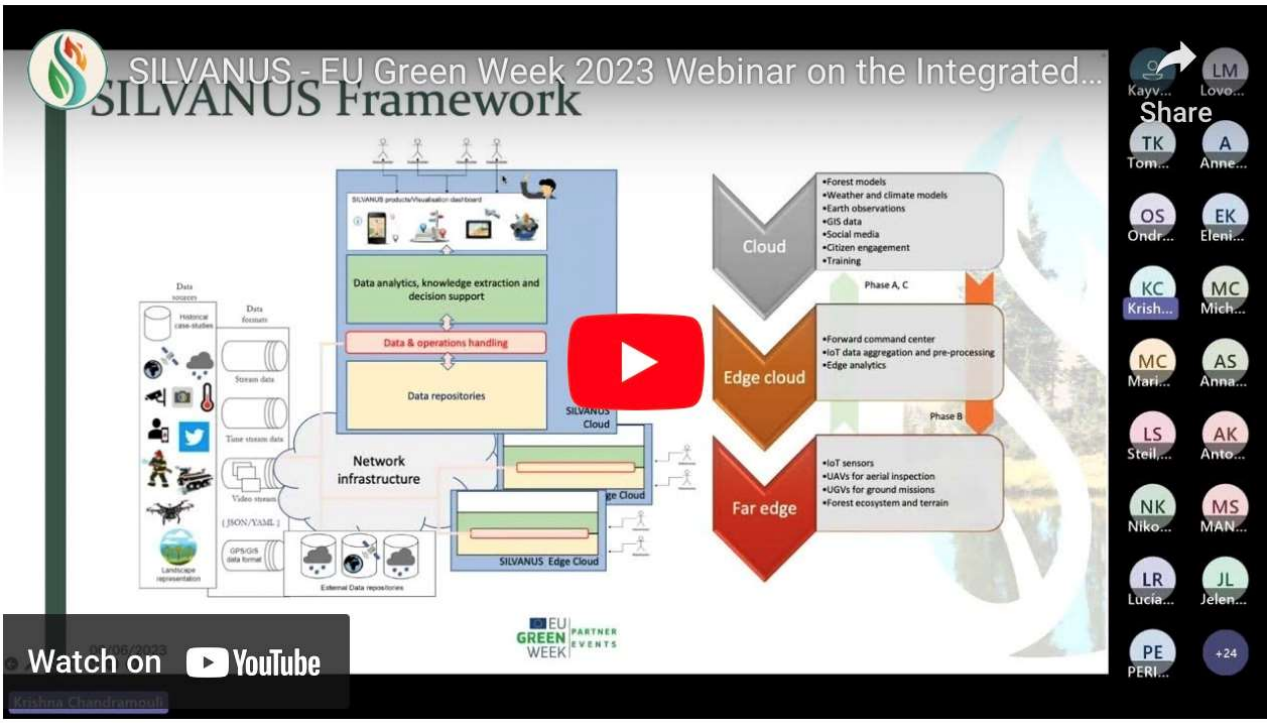


Figure 34 The SILVANUS Green Week Webinar 2023, available on SILVANUS YouTube Channel

50 stakeholders from the areas of IT business, academia and industry attended the webinar either live or virtually, while the recording on YouTube has more than 100 views as of September 2023.

2.1.22 SpliTech Conference in Bol, Croatia

SILVANUS was disseminated at the International Smart and Sustainable Technologies Conference in Bol on the island of Brač in Croatia, organised by the University of Split, on the 22nd of June 2023. Georgia Christodoulou from Catalink Ltd has presented the SILVANUS paper on the Advancement of an Integrated Technological Platform for Wildfire Management through Edge Computing, with an emphasis on the presentation of the fire detection IoT device, one of the user products of the SILVANUS platform. Along with CTL, ATOS, VTG and MD were SILVANUS consortium partners included in the writing of the paper.

The conference's main topic was on smart and sustainable technologies (IoT, Artificial Intelligence applications etc.). The SILVANUS presentation was part of the Wildfire Track Workshop, which was attended mainly by wildfire researchers (PhD candidates, professors etc.). During the workshop, SILVANUS platform was presented and an example of the IoT devices currently being developed in the context of the project. The presentation attracted the attention, since the 15 attendees have been asking for more details after the end of the presentation (e.g., cost of the whole platform, whether the fire fighters are giving feedback, how the citizens are engaged, what kind of AR technologies are used for the fire fighters training etc.).

Figure 35 Georgia Christodoulou from Catalink Ltd presenting SILVANUS at SpliTech Conference 2023

2.1.23 Weekend with the Slovak Academy of Sciences

In 2023, the Slovak Academy of Sciences commemorates the 70th anniversary of the adoption of the Act on the Slovak Academy of Sciences, which defined its foundations and the form in which it exists today. The Academy celebrated this significant jubilee on June 23rd, 2023, with several events, one of which was the SILVANUS presentation in front of an audience of 120 people (scientists and the general public).

Figure 36 SILVANUS Presented at the Weekend with the Slovak Academy of Sciences

2.1.24 Round Table Discussion - Cooperation in Forest Fire Risk Management in Slovakia

The round table discussion was organised at the Technical University in Zvolen on June 27th, 2023, to discuss the cooperation in forest fire risk management in Slovakia with an emphasis on utilizing the SILVANUS project results. Among the participants of the discussion, 4 representatives of the Ministry of Agriculture of the Slovak Republic, 4 from the National Forest Centre - NLC, 4 from Ministry of Interior of the Slovak Republic – Fire and Rescue Service - HaZZ and 3 representatives of SILVANUS project, e.g. local Slovak CASD (Centre for Adaptation Strategies and Development). The program was composed of the following activities: i) Presentation of the SILVANUS project (Andrea Majlingova); ii) Introduction of the Centre for Adaptation Strategies and Development (Lenka Marcinekova); iii) Presentation of prepared methodologies useful in fighting forest fires (Andrea Majlingova); iv) Preparation of a contract on cooperation and data provision between the Ministry of Agriculture and Rural Development and Ministry of Interior. More details on this CASD activity can be found in Section 5.2.

Figure 37 Presentation of the SILVANUS project for the Core Group of stakeholders involved in the "Round Table" discussion in the 1st phase

2.1.25 SILVANUS Open Day Forest Fires Workshop in Thessaloniki, Greece

The results of SILVANUS were presented on June 28th, 2023, at the Open Day Forest Fires Workshop – Digital Solutions to Wildfire Management and Citizen Engagement in Thessaloniki, Greece, which was organised by SILVANUS partner Hellenic Rescue Team.

The objectives of the workshop were:

- The increase of knowledge and understanding of the causes, impacts, and management of forest fires.
- Raising awareness and educating citizens about forest fires and their impacts on ecosystems, biodiversity, climate, and human communities.
- Promoting collaboration and networking among participants.

The workshop was open to the public and attended by 95 participants, namely civil society in conjunction with a more targeted stakeholder group, which consisted of local civil protection authorities (Municipality Civil Protection Department, Fire Service, the local Airforce Combat Wing (firefighting aircrafts), Thessaloniki Forestry, Reforestation Authority), Civil Protection Volunteer Organizations and journalists.

The workshop, which was open to public, was conducted on June 28th, 2023, in the Thessaloniki Municipality premises and was attended by 95 participants. The event had a three-hour duration, and its main goal was to increase knowledge and understanding of the causes, impacts and management of forest fires. Additional objectives were raising awareness and educate the citizens about forest fires and their impacts on ecosystems and the promotion of collaboration and networking among participants.

For the workshop implementation, HRT strongly collaborated with MDS and HB, especially for the interactive part of the event. Using the Slido app, more than 50 attendees were cooperating, asking questions and giving feedback on the project.

The event was opened by Mr Vasilis Moisidis, Head of the Civil Protection Department in the Thessaloniki Municipality and presentations were held by Ms Peri Kourakli, from the Thessaloniki Forestry Department and Mr Christos Papachristos, from the Thessaloniki Fire Service, who kindly accepted HRT's invitation to join the workshop. The agenda was complemented by Aristeidis Bozas from CERTH, who presented Social Media Sensing, Eleni Kotali from MDS, who talked about the SILVANUS citizen engagement program and application and Iosif Vourvachis from HRT, who presented the project. Eleni Kotali was also the host of the interactive session featuring the Slido app.

Many participants were engaged in discussions throughout the workshop and were keen on replying in real-time in the questions raised through Slido. Those replies were gathered by HRT and have been send to the HB.

The event was disseminated through social media channels (Facebook, Twitter, LinkedIn, Instagram) of HRT, the website and direct emails were sent out to HRT partners, donors, sponsors, local associations, teams and clubs. A press release was distributed to local and national media, which resulted in two radio interviews before the event and the TV coverage of the event by the national channel and news agency.

Figure 38 The Open Day Forest Fires Workshop in Thessaloniki, Greece

Figure 39 Iosif Vourvachis from HRT giving an interview at the Open Day Forest Fires Workshop

2.1.26 Green Deal Projects Support Office Webinar – SILVANUS as a Success Story

SILVANUS was presented as a success story at the Green Deal Projects Support Office online webinar – Presenting the Green Deal Call projects: Progress, success stories and Q&A, as part of the Network of Multipliers, within the biodiversity and climate change working group.

Lovorko Marić presented the successful implementation of two pilots in Croatia and Slovakia, along with the accompanying educational and promotional campaigns (with a focus on the poster exhibition in Rijeka, Croatia), to a wide pool of stakeholders. The participants included coordinators and dissemination managers of a number of Green Deal H2020 projects, who presented their own success stories.

A fruitful discussion followed, finding interesting synergy points between the projects, which may lead to other initiatives that will bring benefits in the area of biodiversity and climate change. This was an opportunity for SILVANUS to share its results to a wide pool of Green Deal projects which go way beyond the scope of wildfire management (projects such as WaterLANDS, CityCLIM, ENERGICA, LOCALISED, SISTERS, etc.). Approximately 50 attendees were present at the webinar. A recording of the webinar is available on the YouTube channel of the Green Deal Projects Support Office (https://www.youtube.com/watch?v=yINtCBueQ28).

Figure 40 SILVANUS as a Success Story at the GDSO Webinar

2.1.27 SILVANUS at the MAIA Webinar on Wildfire and Forest Management

SILVANUS project was presented and discussed at the MAIA (Maximising the Impact and Synergy of Climate Change Research and Innovation) project webinar on wildfires and forest management, together with other WFRM H2020 projects SAFERS and Firelogue. MAIA project is an EC-funded research and innovation project that focuses on providing and implementing a set of effective measures that facilitate a wider dissemination, communications, and interconnection of completed and on-going EU climate change research projects.

The focus of the SILVANUS presentation by Lovorko Marić was on the objectives and outcomes of the project, focusing on the recent successful promotional campaigns and pilot exercises in Croatia and Slovakia. A fruitful discussion focused on the lessons learned and on the possible synergies of wildfire management projects. The cross-sectoral and interdisciplinary nature of wildfire management was emphasised and how more is needed to find a common knowledge between the diverse stakeholder groups. Approximately 20 attendees were present at the webinar.

The recording of the webinar is available on the official MAIA Youtube channel: https://www.youtube.com/watch?v=VTuOFljX7N4 .

Figure 41 SILVANUS Presented at the MAIA Webinar

2.1.28 SILVANUS Poster and Video Exhibition at the Firefighting Museum in Varaždin, Croatia

SILVANUS consortium partner Croatian Firefighting Association has opened a poster, video and equipment exhibition on the objectives and outputs of the project on August 19th, 2023, at the Firefighting Museum in the town of Varaždin, Croatia. This was organised at the time of Špancirfest 2023, an annual cultural festival in Varaždin that receives hundreds of thousands of visitors each year in August.

The organisation of the exhibition was implemented by Vedran Runjić, the curator of the Croatian Firefighting Museum. The opening of the exhibition was, among others, attended by the honorary president of the Varaždin County Firefighting Association Zvonko Biškup and the County Firefighting Secretary Zvonko Videc, the City of Varaždin Firefighting Commander Ivica Labaš, and the Varaždin Firefighting Volunteer Society President Radovan Martinec. SILVANUS was introduced by Lovorko Marić.

The exhibition features posters on SILVANUS objectives and outputs, the SILVANUS promotional video and the news and interview coverage from the Croatian pilot exercise that took at place at the Training Centre of Šapjane in April. 30 people attended the exhibition opening, consisting of citizens, energy sector, and firefighting associations. It is expected that more than 500 people will attend the exhibition, primarily pupils and students.

The SILVANUS exhibition will be displayed at the Croatian Firefighting Museum in Varaždin, Croatia until the end of 2023.

Figure 42 The SILVANUS poster and video exhibition at the Firefighting Museum in Varaždin, Croatia

Figure 43 Opening of the SILVANUS Exhibition in Varaždin, Croatia

2.1.29 International Workshop on Emerging Network Security in Benevento, Italy

SILVANUS was presented at the 6th International Workshop on Emerging Network Security (ENS 2023), co-organised by SILVANUS consortium partner Warsaw University of Technology (WUT), as part of the 18th International Conference on Availability, Reliability and Security (ARES 2023), in Benevento, Italy, on August 29th, 2023.

SILVANUS team members Natan Orzechowski, Wojciech Mazurczyk and Krzysztof Cabaj from WUT presented the paper “Security Architecture in the SILVANUS Project”, which is a joint SILVANUS scientific publication between Warsaw University of Technology, ITTI and Netcompany-Intrasoft. About 50

participants were present during both sessions of the ENS workshop. The audience consisted of experts from academia and industry.

Figure 44 Natan Orzechowski from WUT presenting SILVANUS at ARES 2023

2.1.30 Fire Protection 2023 Conference in Ostrava, Czech Republic

On September 6th and 7th, 2023, a scientific conference "Pozarni ochrana 2023 / Fire Protection 2023" was organised in Ostrava, Czech Republic. The organisers of this Conference are Faculty of Fire Safety Engineering of the VŠB-TU Ostrava, Fire and Safety Engineering Association (Czech Republic) and Czech Association of Fire Officers. At the Conference, there were 7 presentations related to the SILVANUS project and its outputs by the project representatives (Figure 45). Andrea Majlingova from TUZVO presented the SILVANUS project and the outcomes of the Slovak Pilot Study. Lenka Marcinekova from TUZVO presented the Centre for Adaptation Strategies and Development (CASD), which was established at TUZVO in April 2023 as a local / national pilot project. Marek Gašparín (HZS MSK) presented the Czech Pilot Study. Simona Kalinovská (3MON) presented the possibilities of robotics in firefighting, especially the capabilities and skills of the Colossus robot. Zoltan Balogh (UISAV) presented the protocol for mass communication with the public during forest fires. Emil Gatial (UISAV) presented the citizen engagement mobile application being a part of SILVANUS platform. Ján Zelenka (UISAV) presented possibilities of swarm coordination of unmanned aerial vehicles for monitoring of forest fire.

The Conference had more than 150 participants, all the professionals in the sphere of fire protection and safety, including professional and volunteer firefighters.

Figure 45 SILVANUS Project Representatives at the Fire Protection 2023 Conference in Ostrava

2.1.31 iProcureNet Workshop in Nicosia, Cyprus

Andrea Majlingova and Lenka Marcinekova from TUZVO were active participants at the workshop organized by the iProcureNet project in Nicosia, Cyprus, on September 12, 2023. The workshop focused on presentations of H2020 & Horizon Europe projects and innovative supplier researching solutions within the scope of identified innovation needs for Joint Cross-Border Public Procurement (JCBPP). The aim of the discussion was developed research and solutions within the scope of identified innovation needs for JCBPP. This workshop was opened to H2020 and Horizon Europe project representatives, innovative suppliers, procurement experts and iProcureNet consortium members. Participants have got the opportunity to provide insights around the state-of-the-art technology and development in the segments that were identified within the iProcureNet projects as promising for JCBPP and the solutions developed within existing innovative projects.

Andrea Majlingova provided the overview of the SILVANUS project, its outcomes as well as the experience from the demonstration of Pilot Study in Slovakia. Lenka Marcinekova presented the activities and objectives of the Slovak Centre for Adaptation Strategies and Development. Konstantinos Karystinakis from CERTH presented the citizen engagement app. The presentation was made in front of approximately 50 attendees.

Figure 46 Andrea Majlingova from TUZVO presenting SILVANUS at the iProcureNet Workshop

2.1.32 International Fair of Thessaloniki, Greece

Dr. Nikolaos Kalapodis from Center for Security Studies (KEMEA) presented SILVANUS on September 10t^{h,} 2023, at the 87th International Fair of Thessaloniki, organised by TIF-HELEXPO. SILVANUS had a stand with the presentation explaining the objectives and outputs of the project. Flyers and other promotional material were also distributed at the exhibition. The fair was a place for new ideas and proposals to be presented to the market on topics of technology, innovation, environmental protection, energy, education, to over 280,000 people visit this exhibition. At least 200 people have had access to the interactive presentation of SILVANUS and had become familiar with the results of the project.

Figure 47 Dr. Nikolaos Kalapodis from KEMEA presenting SILVANUS at the International Fair of Thessaloniki, Greece

2.1.33 SafeAttica Conference in Athens, Greece

SILVANUS was presented on September 27th, 2023 at the 10th International Civil Protection Conference - SafeAttica 2023 in Athens, which is organised in collaboration with the Region of Attica in the premises of the Athens War Museum. The primary objective is to bring together people from academia, local government and central administration, private sector and voluntary organisations from Greece and abroad aiming to:

- strengthen interdisciplinarity and cooperation in Civil Protection,
- demonstrate new technological achievements for the benefit of Civil Protection,
- exchange of experience, lessons learned and good practices,
- discuss contemporary challenges about Civil Protection

SILVANUS team member Aristeidis Bozas from CERTH presented SILVANUS in front of an audience of 30 people. Consortium member KEMEA was also present to discuss the project. The focus of the presentation was on the social media sensing tool, one of the user products of the SILVANUS platform in front of audience of academics, local administration officials, private companies and voluntary organisations. This was another opportunity to showcase an essential component of the SILVANUS platform to a versatile audience.

Figure 48 Aristeidis Bozas from CERTH presenting SILVANUS at the SafeAttica Conference

2.2 Newsletter

SILVANUS published four newsletters in the period between October 2022 and September 2023. This brings a total of five newsletters in the first two years of the project. The general template of the newsletter was established in the 1st newsletter and this format was adhered to in every subsequent one.

Topics of the 2nd newsletter, published in October 2022, covered a period of activities from May to September 2022, included a report from the SILVANUS General Assembly meeting in Bari and the visit to the pilot site in Gargano National Park, an overview of international dissemination events, including television coverage, key messages to three stakeholder target groups (energy and water infrastructure, timber industry, infrastructure and road network), a report on submitted Deliverables, and a link to the new SILVANUS promotional video.

Figure 49 The 2nd SILVANUS Newsletter released in October 2022

The 3rd newsletter was a holiday edition released in December 2022. Topics of the newsletter included the main events from November to December 2022, i.e. SILVANUS General Assembly meeting in Athens in December, an overview of international dissemination events, including the presentation of the project and its technical framework at the International Conference for Forest Fire Research in Coimbra, and key messages to three stakeholder target groups (local residents and communities affected by wildfire, civil society organisations, policy makers).

Figure 50 3rd SILVANUS Newsletter published in December 2022

The 4th SILVANUS newsletter, covering the period from January to April 2023, covered a very active period for the project. The articles included SILVANUS receiving the Gold Medal and the best Invention Award at the IPITEX Conference in Bangkok, Thailand, the summary of the poster educational and promotional campaigns, including the one in the City of Rijeka, Croatia, which was introduced by the Mayor of Rijeka Marko Filipović. The newsletter featured reports on the implemented pilot exercises in Croatia and Slovakia, and the overview of recently submitted Deliverables, along with a preview of the European Broadband Competence Offices video on SILVANUS.

Figure 51 4th SILVANUS Newsletter published in May 2023

The 5th newsletter focused on the activities between May and September 2023, with a particular emphasis on the dissemination events in this period, e.g. the RISE-SD conference and the EU Green Week webinar. A report on the General Assembly meeting, along with an overview of user products and a brief preview of the citizen engagement app were also included.

Figure 52 The 5th SILVANUS Newsletter from September 2023

Newsletters are available on the SILVANUS website on as special dedicated page: https://silvanus-project.eu/results/newsletters/. They were published and advertised on the project's social media accounts (LinkedIn and Twitter).

The KPI objective, as per Deliverable 10.1, is to reach an audience of 500 to 2000 newsletter subscribers and viewers on social media and the website, for the duration of the project. As of September 2023, the number of newsletter subscribers is 453, but with the number of followers on SILVANUS social media accounts and the number of website downloads, which go to 1180, the estimate is that approximately 1200 subscribers and followers have downloaded or checked the newsletter.

2.3 Website

In the second year of the project, the SILVANUS website silvanus-project.eu has gone through a significant refurbishing, changing the focus from an awareness-raising to knowledge-sharing approach. The following pages are included in the website map:

- Home – homepage is now focused on depicting the SILVANUS project results – with direct links to software components, user products and pilots, and a gallery of citizen engagement posters. The overarching goal is to emphasise the interactivity of SILVANUS platform. A new video was developed by Renato Cotini from Uni Pegaso as the introduction to the project, which is now airing in a loop at the top of the website.

Figure 53 Opening Video of the SILVANUS website, with the fire turning into the green SILVANUS logo

Figure 54 SILVANUS logo and title at the end of the video

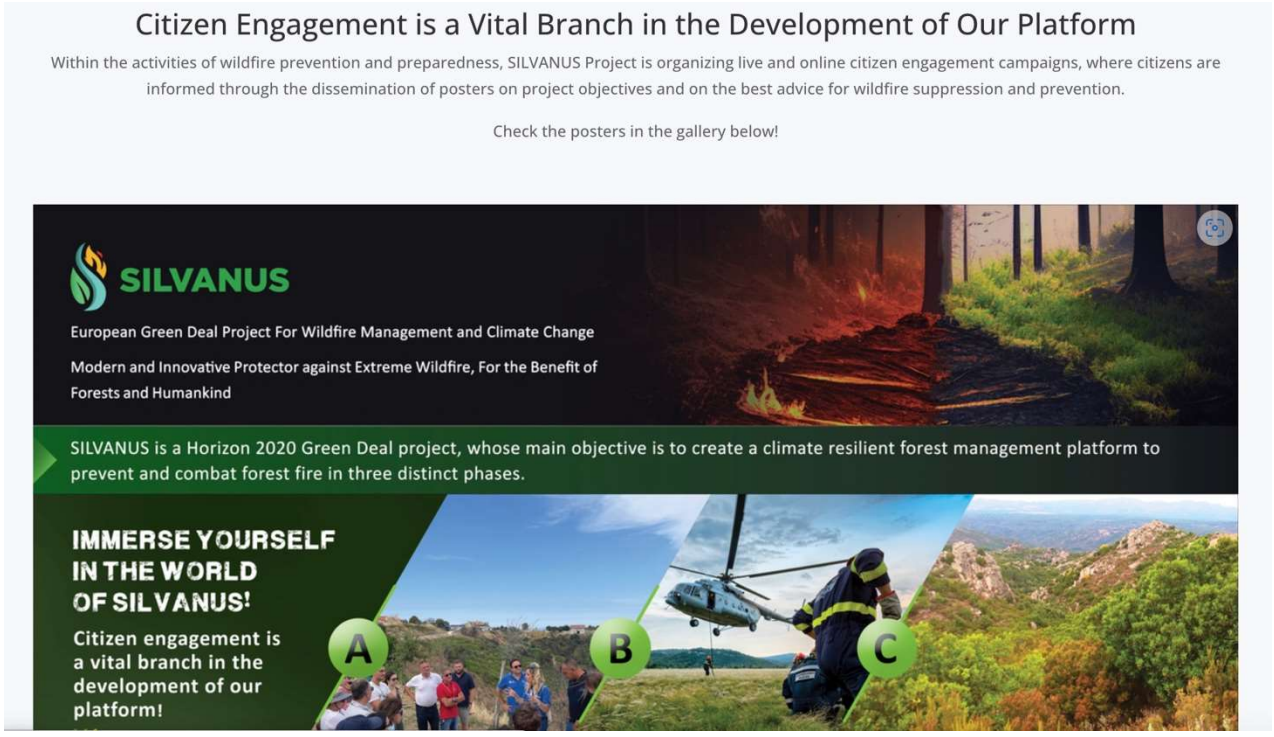


Figure 55 The SILVANUS homepage is emphasising the role of citizen engagement

- News – this page is continuously updated with new developments on the project, including General Assembly meeting reports, site visits and pilot exercises, SILVANUS platform developments,

dissemination events (webinars, workshops, exhibitions, videos), links to the YouTube channel, etc. Between October 2022 and September 2023, 31 article has been published (as opposed to 10 in the first year), which shows a high increase of content, showcasing the project results

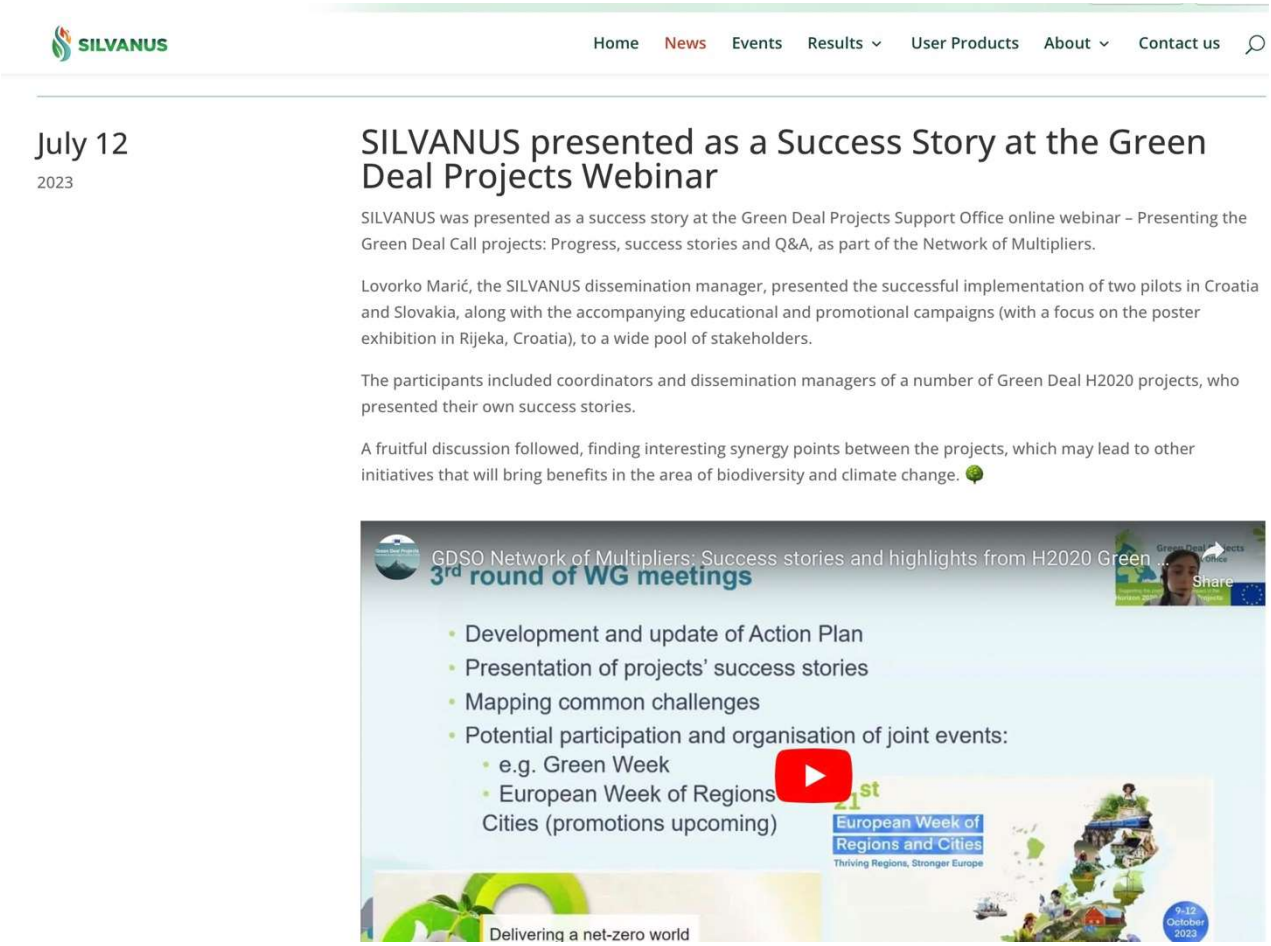


Figure 56 Example of a News Article on the SILVANUS Website

- Events – announcement of events where SILVANUS will be present or which SILVANUS will organise, with a brief description and link to the event.
- Results
    - Deliverables – Public Deliverables are displayed here and are available for download.
    - Pilots – Detailed descriptions of all 12 pilots in 11 countries, updated with reports from the implemented pilot exercises in countries such as Croatia and Slovakia.
    - Scientific Publications – List of all SILVANUS-related scientific publications is available here.
    - Resources – Description of Resources such as the ontology.
    - Newsletters – The SILVANUS newsletters are available here for download.
- User Products – this is a section of the website that has been created in the second year, and is focused on describing the components of the SILVANUS platform.

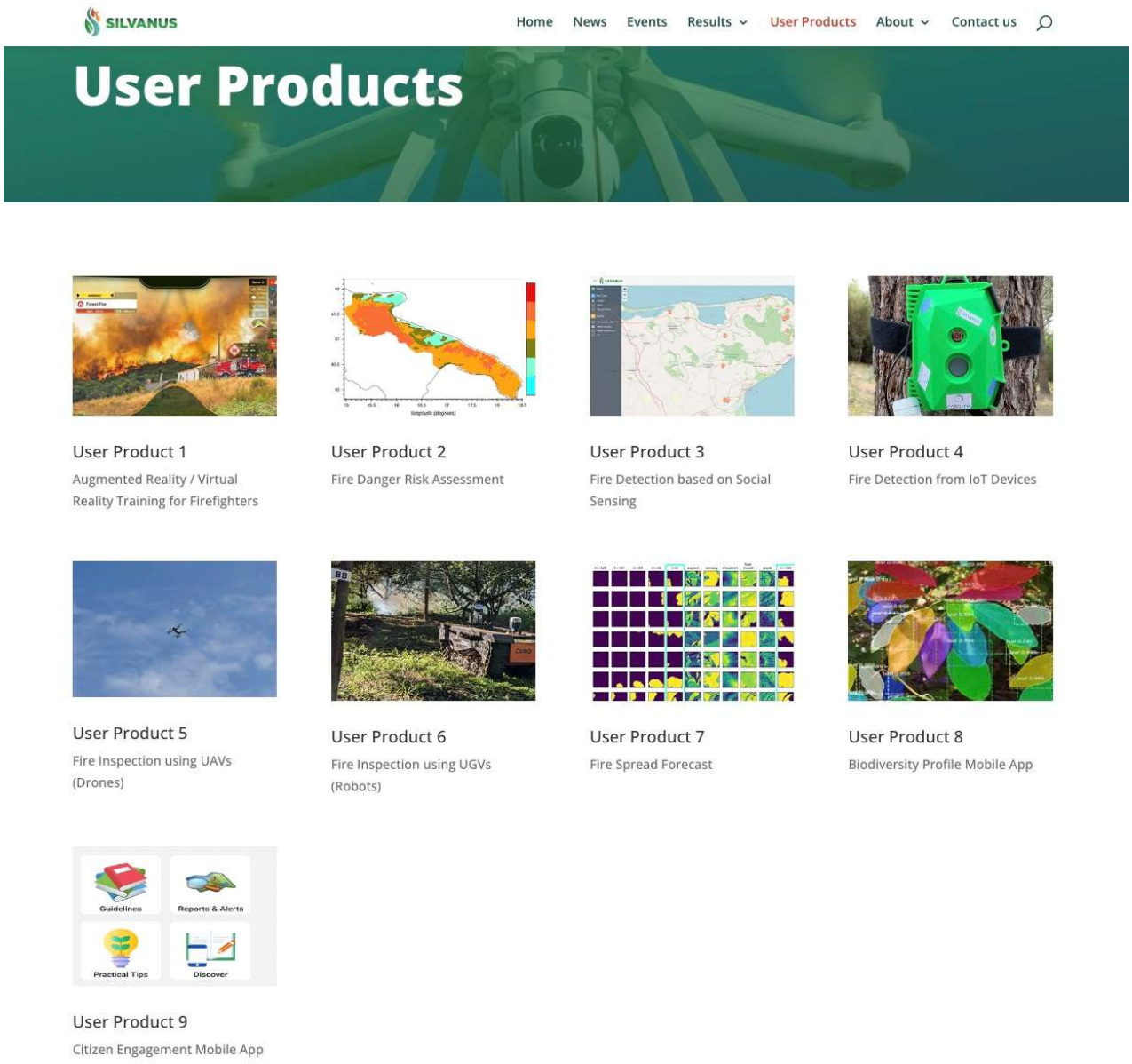


Figure 57 User Product Page on SILVANUS Website

- About – the structure of this section is divided (as in the first year) into the description of Consortium, Work Packages, Our Approach and WFRM project sections

The website's contact form and newsletter subscription has contributed to the expansion of the stakeholder pool, which include further communication with wildfire containment software managers, conference organisers, and other stakeholders from the areas of IT business, energy sector, industry, etc.

As visible in Figure 58, more than 3,400 users have visited SILVANUS website between October and September 2023, which is a 126% increase from the previous year. The most visited pages are the home pages, the news section and the consortium, amounting to 2,441 views for the homepage, 996 for news and 747 for consortium (Figure 59). The homepage had the highest number of views (109) in one day on July 3rd. The highest number of users comes from the United States, followed by Italy, Greece, Croatia and Portugal, as seen in Figure 60. Figure 61 depicts user acquisition in the second year of the project, showing that the highest number of users has visited the website directly, followed by organic search and then by referral.

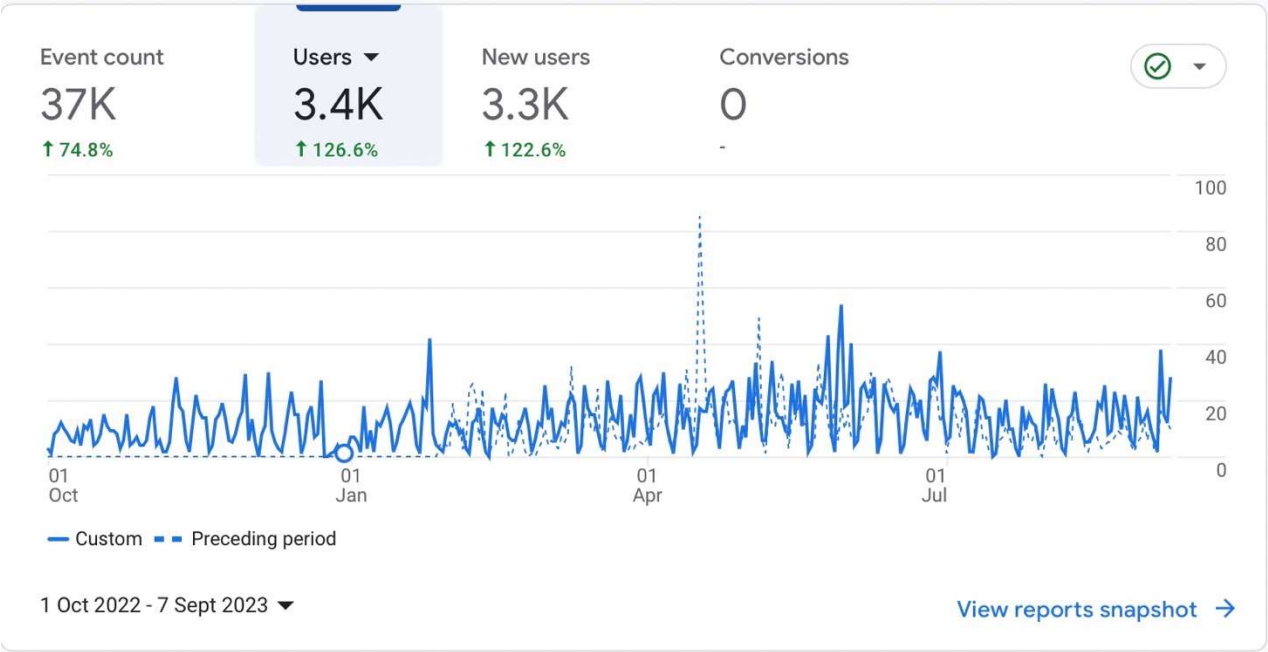


Figure 58 Number of Users visiting SILVANUS Website from October 2022 to September 2023 (per Google Analytics)

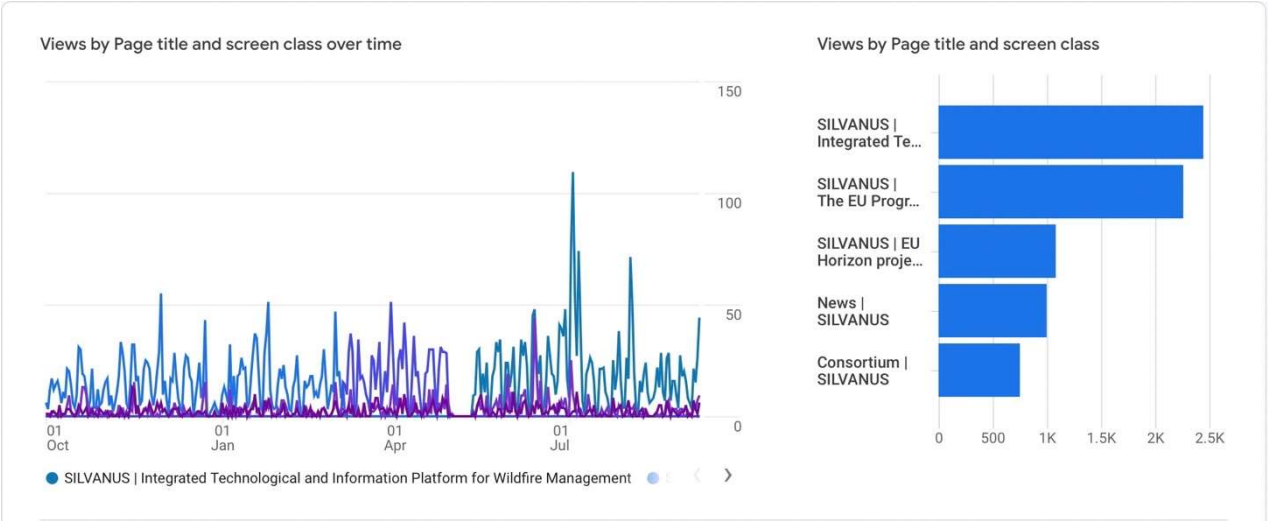


Figure 59 Views of Individual Pages on SILVANUS Website

Figure 60 Users of SILVANUS Website per Country from October 2022 to September 2023

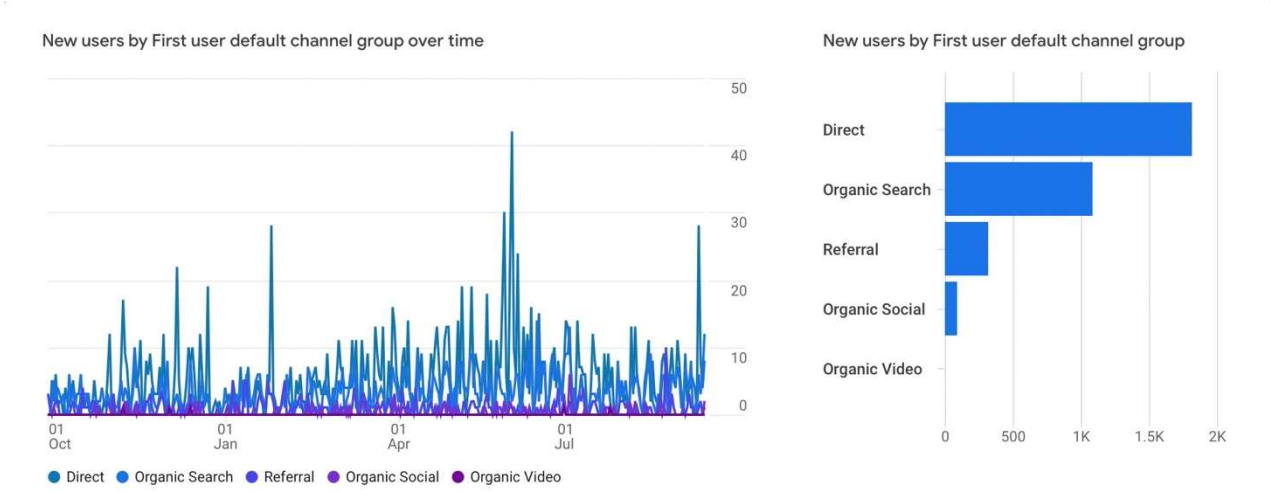


Figure 61 User Acquisition in October 2022 - September 2023 Period

As the project keeps sharing its results and making the SILVANUS platform accessible and interactive, it is expected that the number of visitors will further increase. This is in line with the assigned KPI of 150 visitors per day on average and 100 downloads or referrals per month, which are targets that will be addressed in the following Deliverable as the project results become more widely disseminated.

2.4 Social Media

SILVANUS social media accounts on LinkedIn and Twitter were continuously updated with new posts in the second year of the project, focusing on showcasing project developments, describing the project results,

reporting from the dissemination events, and notifying the followers about any developments or happenings in the wildfire management area, even outside of the scope of the project.

In September 2023, SILVANUS had 733 followers on LinkedIn and 368 followers on Twitter. An Instagram account was opened in March 2023 and is currently in further development design stages, amounting now to 81 followers. The total amount of SILVANUS followers on social media accounts is 1,188.

The biweekly social media educational campaign was one of the most important social media outputs of SILVANUS. Starting in March 2023, posters with key messages for citizens in the fight against extreme wildfire were posted on the SILVANUS social media accounts, accompanied with the campaign slogan "Citizen engagement is a vital branch in the development of our platform!". The goal of the citizen engagement campaign is to prepare and educate citizens in wildfire management, and to introduce them to the SILVANUS platform and the ways they can contribute to its successful implementation.

23 posters will be distributed in total by the end of the year. Posters were designed by SILVANUS partners HB, HRT, PEG and SYNC.

Figure 62 Examples of Citizen Engagement Posters on SILVANUS LinkedIn Account

Figure 63 SILVANUS Greeting Card for World Environment Day

Other LinkedIn posts are made in an essay and/or article form, usually with reports on up-to-date SILVANUS developments, such as the one depicted in Figure 64.

Figure 64 An example of SILVANUS LinkedIn Post

On Figure 65, visitor analytics on LinkedIn in the second year of the project are summarized, with 2,186 page views and 796 unique visitors, which is an increase from the first year of the project that had 2,015 page views and 665 unique visitors. Peak visits were in March and June 2023. The highest number of users come from the research area (379), followed by business development (253), media and communication (166), and education (157), as visible in Figure 66.

There were 70 LinkedIn posts written during the second year of the project, which is beyond the one-post-per-week minimum target (which is approximately 48).

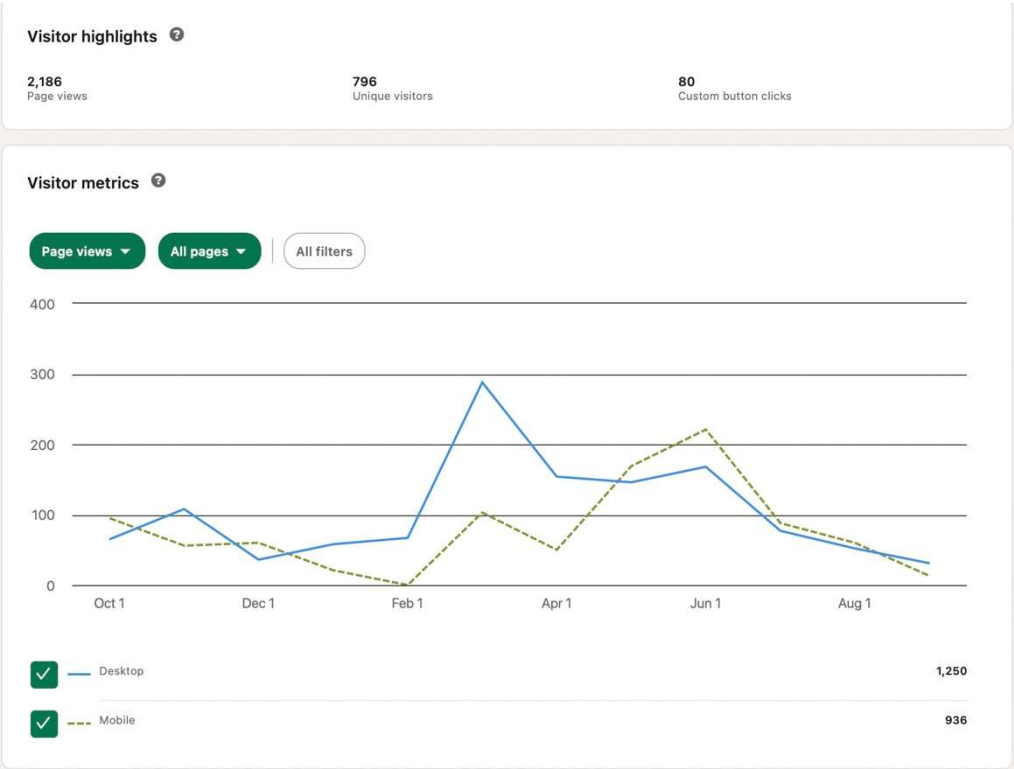


Figure 65 SILVANUS LinkedIn Visitor Metrics from October 2022 to September 2023

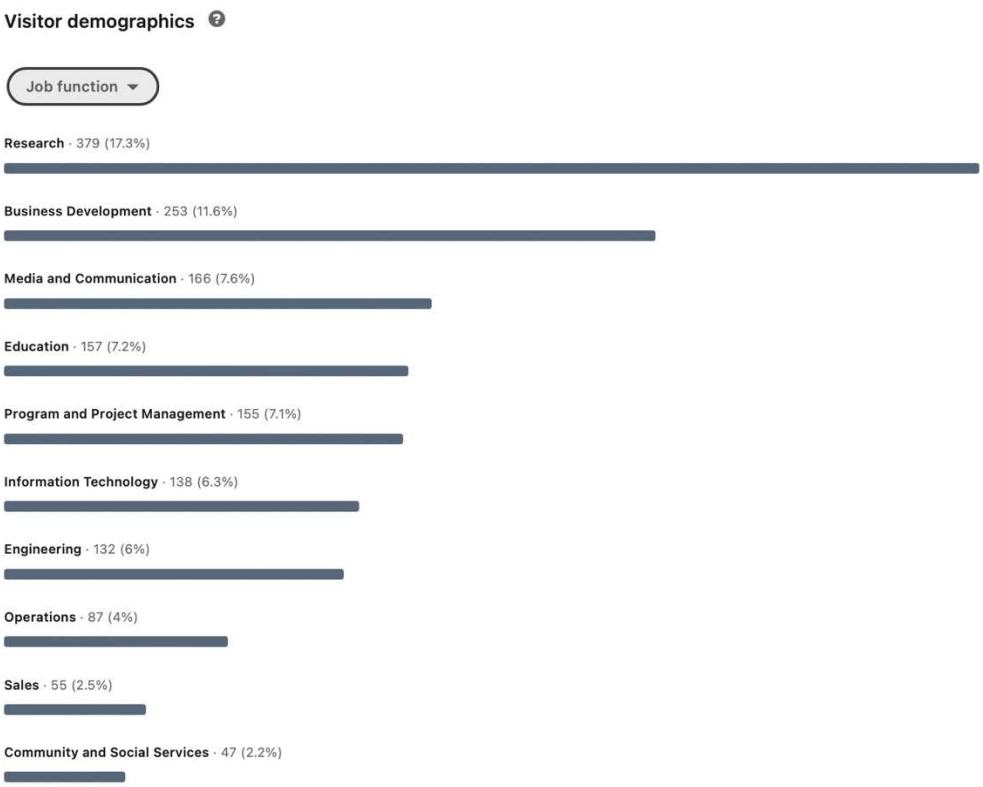


Figure 66 SILVANUS LinkedIn Account Visitor Demographics

SILVANUS Twitter focused further on regular project updates, marketing campaigns (such as the International Firefighters Day social media campaign, done in cooperation with Firelogue as in 2022), sharing of SILVANUS scientific publications, etc. As of September 2023, there were 211 tweets and retweets. The biweekly citizen engagement campaign, as emphasised above, was one of the main outputs during 2023.

There were 81 original Tweets published in the period from October 2022 to September 2023. In the most active period during this period, between April and June 2023, 9,900 impressions (visibility of a Tweet) were earned, with 108 impressions per day.

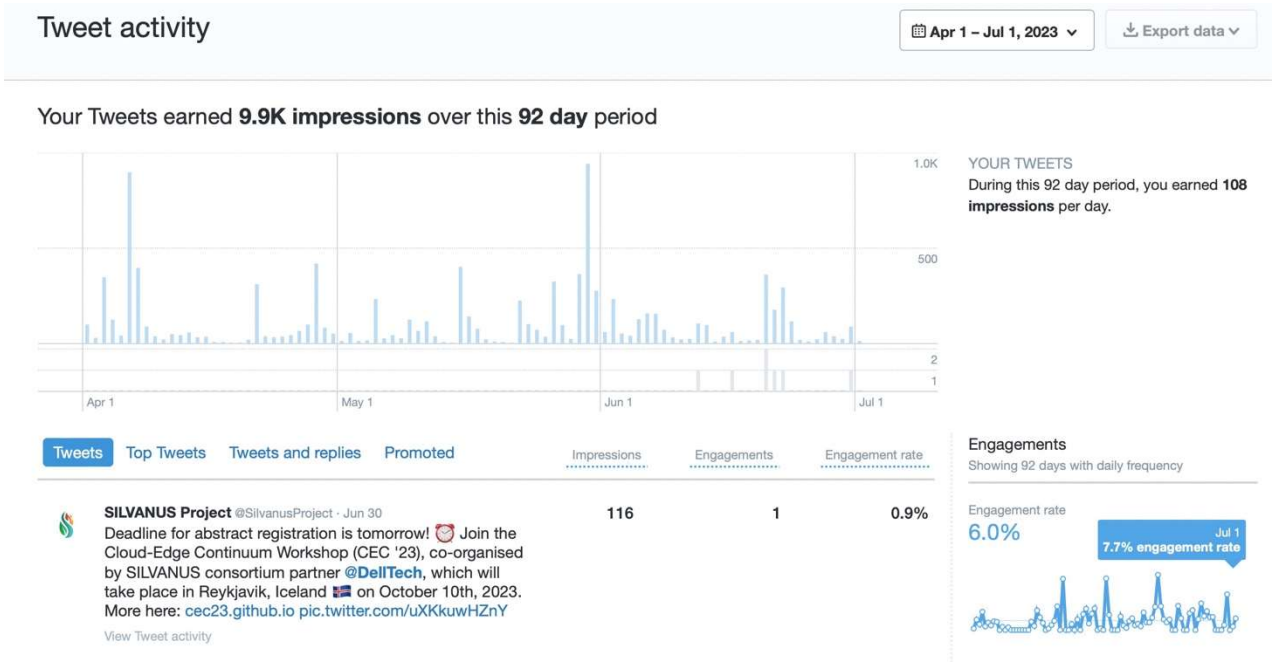


Figure 67 SILVANUS Project Twitter Activity

With the 1,188 total followers and the post count whose average is higher than one post per week, SILVANUS is on target with achieving the KPIs of having at least 1,100 followers and readers on LinkedIn and Twitter, and in accordance with a minimum one-post-per-week activity.

2.5 Television

2.5.1 Croatian Television Reports from the Promotional Campaign and Pilot Exercise in Rijeka and Šapjane, Croatia

The opening of the SILVANUS poster exhibition in Rijeka, Croatia was covered by local, regional and national Croatian television (HRT). Mayor of Rijeka Marko Filipović and Chief Croatian Firefighting Commander Slavko Tucaković opened the exhibition, which gave the project an additional marketing value that proved to be efficient in attracting viewers. Around 50,000 viewers tune every day in Croatia to watch the daily news on HRT Channel 4, where a report on the SILVANUS exhibition was featured. The video of the national TV coverage, which featured interviews with Mr. Filipović, Mr. Tucaković, Deputy Primorje-Gorski Kotar County Prefect Vojko Braut and County Firefighting Commander Mladen Šćulac, is available on SILVANUS YouTube channel with English subtitles.

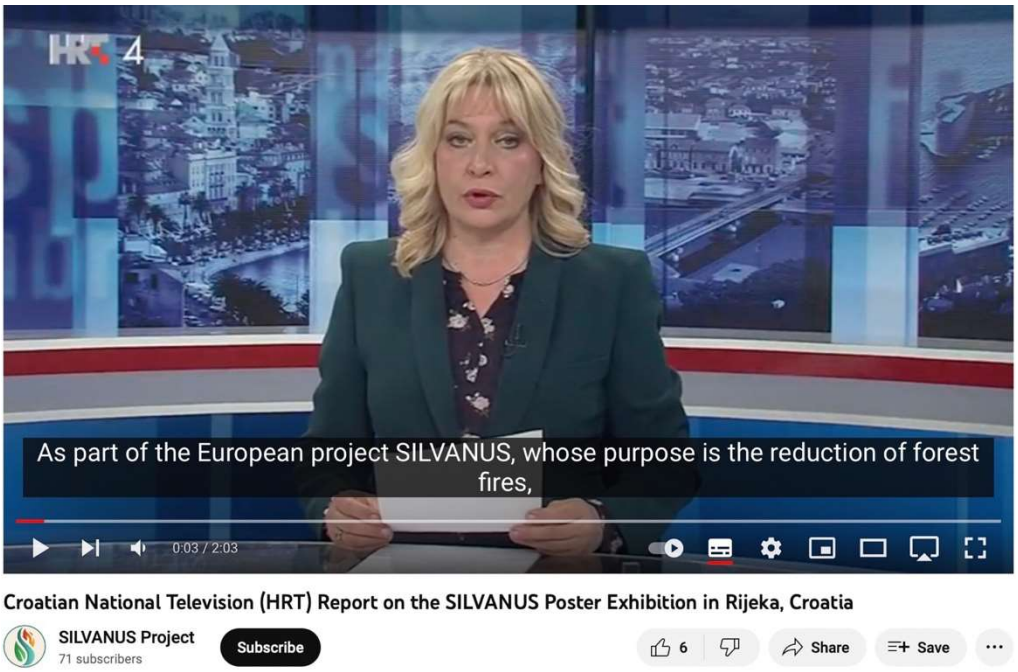


Figure 68 Croatian National Television Coverage of SILVANUS Exhibition in Rijeka

The Croatian pilot exercise on 18th and 19th of April was covered by local and regional television. The news report featured interviews with Mr. Tucaković, Mr. Šćulac, the County Prefect Zlatko Komadina, the Matulji Municipality Officer Vedran Kinkela and Simona Kalinovska from SILVANUS partner 3MON, who demonstrated the use of ground robots for suppressing wildfire. Nikica Tramontana from HVZ concludes the 10-minute news report with a summary of the entire pilot exercise. The recording, made by the regional Novinet Tv channel, is available on SILVANUS YouTube channel. The TV reports have more than 200 views on YouTube.

Figure 69 Nikica Tramontana from Croatian Firefighting Association presenting the SILVANUS Pilot Exercise

2.5.2 Reports on the Slovak Pilot Exercise on Slovak National Television

The Slovak Republic Radio and Television (RTVS) has aired within the programme VAT a news report on the SILVANUS pilot exercise in the Pol'ana region of Central Slovakia. SILVANUS team members Andrea Majlingova from TUZVO and Simona Kalinovska from 3MON were interviewed on the use of new technologies in wildfire prevention and suppression, and equipment such as drones and ground robots were demonstrated. The news report was aired on April 15th, 2023, for an audience of twenty to thirty thousand people. Link to the recording (in Slovak only): https://www.rtvs.sk/televizia/archiv/14067/397418#1581.

Figure 70 Andrea Majlingova from TUZVO explaining SILVANUS on WAT Programme on RTVS

Reports from the Slovak pilot exercise on the July 25th, 2023, were aired on the main daily news on the 1st channel of RTVS, and on the channel JOJ TV on May 1st. Approximately fifty thousand viewers had access to the news report on the SILVANUS pilot exercise.

Figure 71 Slovak SILVANUS Team explaining the project goals before the Slovak Pilot Exercise

On September 11th, 2023, Andrea Majlingova from TUZVO and Zoltan Balogh from UISAV were interviewed at the talk show Experiment on RTVS (Slovak National TV) about the SILVANUS project and the Slovak pilot exercise, which took place on April 25th. The episode was called "How Science Fights Fires". This was a 30-minute interview with two SILVANUS experts that has brought a major exposure of the project to an audience of tens of thousands of Slovak citizens. The link to the interview:

Figure 72 Andrea Majlingova interviewed about SILVANUS on the RTVS Talk Show Experiment

Figure 73 Report on the Slovak Pilot Exercise on RTVS Talk Show Experiment

Figure 74 Zoltan Balogh from UISAV explaining SILVANUS Project on the RTVS Talk Show Experiment

2.5.3 France 3 Nouvelle-AquitaineCoverage on SILVANUS and the Slovak Pilot Exercise

French television channel France 3 Nouvelle-Aquitaine aired a news report on June 7th, 2023 about the danger of forest fires in France, while reporting on the pilot exercise in Slovakia, from the perspective of the SILVANUS project partner PUI. The TV report is available here (in French): https://france3-regions.francetvinfo.fr/nouvelle-aquitaine/gironde/bordeaux/incendies-l-ete-de-tous-les-dangers-dans-les-forets-du-sud-ouest-2787110.html, in front of an audience of approximately 50,000 people.

Figure 75 Excerpt from the France 3 Video Coverage on the Slovak Pilot Exercise

2.6 Promotional Material

Along with the brochure, the flyer and the roll-up banner developed in the first year of the project, the following material were either updates or brand-new concepts developed within the SILVANUS promotional strategy.

The new SILVANUS flyer was developed in November 2022 in preparation for the International Forest Fire Research Conference in Coimbra and disseminated at all of the subsequent dissemination events explained in detail in Chapter 2.2., such as the RISE-SD conference in Rhodes, the DEFEA Exhibition, etc. The flyer focuses on explaining the three phases of SILVANUS platform implementation (prevention and preparedness; detection and response; restoration and adaptation) and the user products as essential components of the platform. More than 250 flyers were distributed to interested stakeholders and citizens during dissemination events (RISE-SD, IFFRC Coimbra…), which is in line with the determined KPI of promotional material being supplied to at least 250 people.

Figure 76 The SILVANUS Flyer

Figure 77 shows the new roll-up banner, developed by PEG and distributed at SILVANUS-organised dissemination events.

Figure 77 SILVANUS Roll-Up Banner

Special SILVANUS pens, notebooks and bags were also distributed at large events such as the RISE-SD conference.

2.7 Press Releases

SILVANUS press releases in the second year of the project were focused on describing the implementation of pilot exercises in Croatia and Slovakia, and on the opening of the promotional campaigns.

Two press releases were made on the announcement and the report of the SILVANUS poster exhibition in Rijeka, Croatia. The release was named “An exhibition was opened on the Korzo Street in Rijeka on wildfire prevention” and it was published in seven local and national media outlets on April 3rd, 2023. It is estimated that more than 20,000 people have read these articles.

Figure 78 Press Article on SILVANUS Poster Exhibition in Rijeka, Croatia (Croatian Radio and Television)

A press release, named “The SILVANUS project has demonstrated a wildfire suppression pilot exercise”, was published on April 20th, 2023, and published in nine media outlets. More than 30,000 people are estimated to have accessed these articles.

Figure 79 Press Article about the Croatian SILVANUS Pilot Exercise (Ps-portal.eu)

On July 5th, 2023, an article was issued on the Osservatorio Balcani e Caucaso Traseuropa (OBC Transeuropa think-tank) website, titled „Croatia shows how to deal with worst wildfires“. The article, written by Chiara Marchesini, featured an overview of SILVANUS and included interviews with SILVANUS dissemination manager Lovorko Marić and Croatian Firefighting Association Željko Cebin. Along with a general description of SILVANUS and the pilot exercises, the Croatian pilot was described in detail. The article was read by tens of thousands of readers, particularly in countries of the Mediterranean region. Link is available here (in English): https://www.balcanicaucaso.org/eng/Areas/Croatia/Croatia-shows-how-to-deal-with-the-worst-wildfires-225864 .

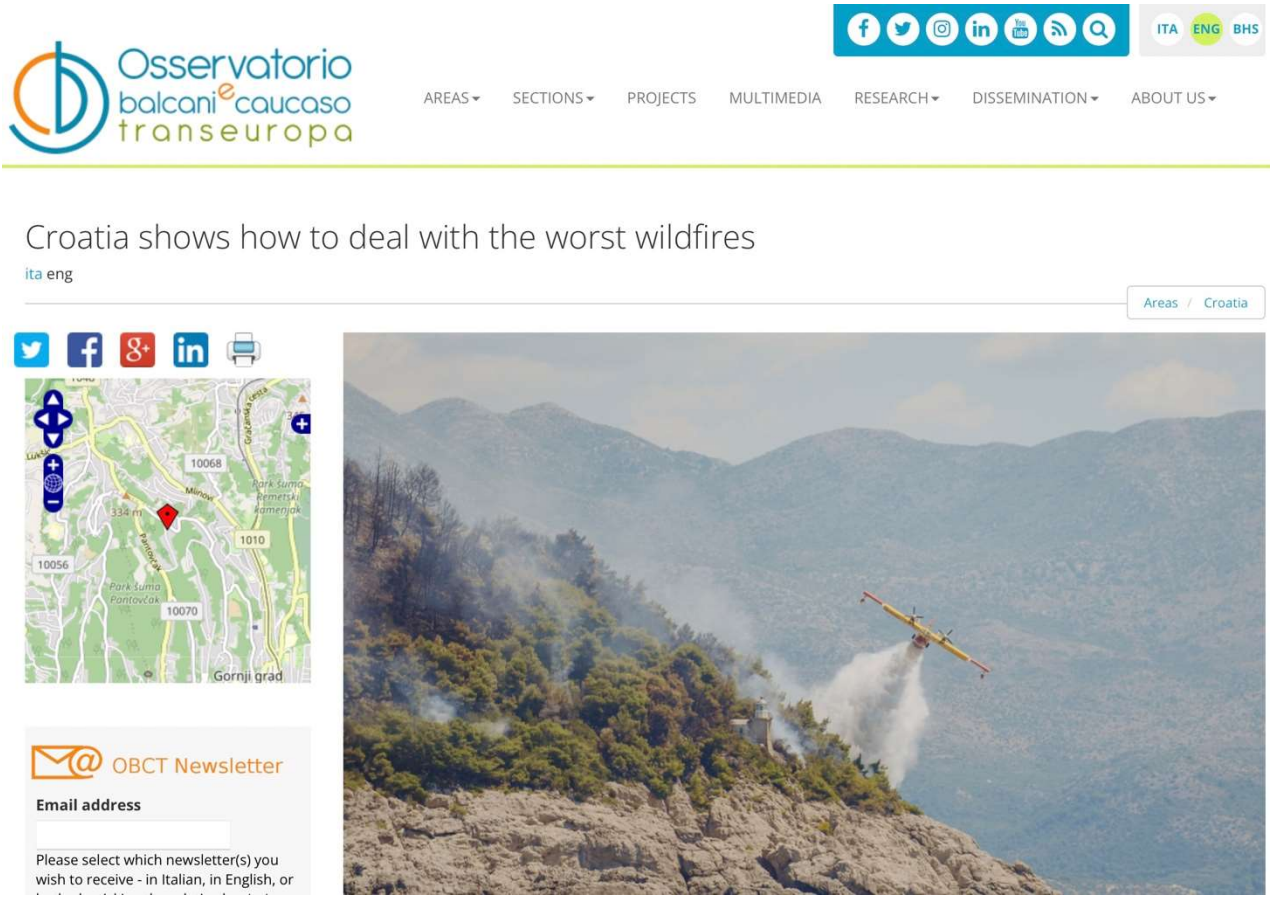


Figure 80 The OBCT Article on the SILVANUS Pilot Exercise in Croatia - "Croatia shows how to deal with wildfires"

For the Slovak pilot exercise, the press release was reported by ten media outlets, including radio, alongside the TV reports elaborated on in the previous chapter. More than 50,000 people were expected to have read these articles.

Hasenie lesných požiarov v rámci projektu Silvanus

Ilustračný obrázok. Zdroj: iStockphoto.com

Figure 81 Press Article on the Slovak Pilot Exercise

French news channel France 3 Nouvelle Aquitaine has published two press articles on the status of SILVANUS, its role in the fight against extreme wildfire in France with an emphasis of activities of SILVANUS member PUI (International Emergency Firefighters), and the implementation of the pilot exercise in Slovakia.

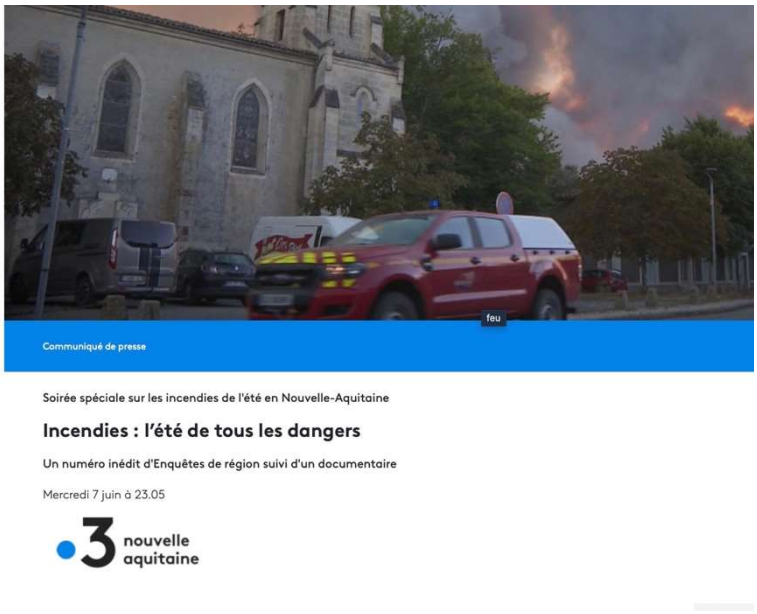


Figure 82 Press Article on SILVANUS for France 3 Nouvelle Aquitaine

A press release, named “A SILVANUS exhibition was opened in the Firefighting Museum Varaždin, Croatia” was made on the opening of the SILVANUS exhibition at the Firefighting Museum in Varaždin, Croatia. It was announced in 11 media outlets and reported in additional 5, as part of the reporting on the major Špancirfest cultural event, within which the exhibition was organised.

Izložba SILVANUS, Varaždin - otvaranje / foto: HVZ

U Varaždinu otvorena izložbe u sklopu EU projekta SILVANUS

Objavio **Aleksandar Olujić** - 20 kolovoza, 2023

Figure 83 Press Article on the SILVANUS Exhibition in Varaždin, Croatia

SILVANUS has gained significant exposure from these reports and has far surpassed the targeted number of citizens and stakeholders who have read about SILVANUS via press articles (5000 on average).

2.8 Scientific Publications

The following is a list of scientific publications published during the second year of the project that have acknowledged SILVANUS and are written by SILVANUS partners. Publications were included in some of the most reputable scientific journals such as IEEE and Remote Sensing. A strong emphasis was made on joint scientific publications by SILVANUS consortium partners, where an interdisciplinary approach was emphasised between the social, technical and environmental experts on how to resolve questions and offer scientific novelties in the fight against extreme wildfire. This has produced ambitious papers that included up to 14 authors from seven different consortium partners and versatile academic backgrounds such as technical, social and environmental areas of expertise.

- **Monte Carlo Method for Map Area Calculation in Wildland Fire Map Management** by Kusrini Kusrini, Arief Setyanto et. al., from Universitas Amikom Yogyakarta, Publisher: IEEE, March 2023
- **Wildland Fire Patterns and Firefighting Tactics in Central European Countries** by Andrea Majlingová, Danica Kačiková, Rudolf Kropil and Dušan Hancko from Technical University of Zvolen, Publisher: Technical University of Zvolen, 2022
- **Model Fusion for Efficient Flood-Related Twitter Posts Detection** by Georgia Christodoulou, Stelios Kontogiannis and Konstantinos Avgerinakis from Catalink Ltd, Publisher: MediaEval , January 2023
- **EO4WildFires: An Earth Observation Multi-Sensor, Time-Series Machine-Learning-ready Benchmark Dataset for Wildfire Impact Prediction** by Dr. Dimitrios Sykas, Dimitrios Zografakisa, Konstantinos Demestichasa. Constantina Costopouloua from Department of Agricultural Economy

& Development of the Agricultural University of Athens and Pavlos Kosmidis from Catalink Ltd, Publisher: OpenAIRE, March 2023

- **Communication Protocol for using Nontraditional Information Sources between First Responders and Citizens during Wildfires** by Zoltan Balogh, Emil Gatial, Sepideh Hassankani-Dolatabadi, Štefan Dlugolinsky from Institute of Informatics, Slovak Academy of Sciences in Bratislava, Slovakia; Marco Saltarella and Marcello Paolo Scipioni from Fincons SpA, Italy, Dominika Grunwald, Marcin Przybysweski from ITTI Sp. Z.o.o. Poland; Andrea Majlingova and Yvonne Brodrechtova from Technical University in Zvolen, Slovakia; Kayvan Yousefi Mojir and Nasrine Olson from University of Boras, Sweden; Jelena Levak from RiniGARD, Croatia and Krishna Chandramouli from Venaka TReLeaf, United Kingdom, Publisher: ISCRAM, May 2023
- **Citizen Engagement in Wildfire Management: Needs, Challenges, Methods and Framework** by Kayvan Yousefi Mojir, Elena Maceviciute and Nasrine Olson from University of Boras, Sweden, Emil Gatial and Zoltan Balogh from Institute of Informatics, Slovak Academy of Sciences in Bratislava, Slovakia, Publisher: ISCRAM, May 2023
- **Coordination of Drones Swarm for Wildfires Monitoring** by Jan Zelenka, Tomaš Kasanicky, Emil Gatial and Zoltan Balogh from Institute of Informatics, Slovak Academy of Sciences in Bratislava, Slovakia; Andrea Majlingova and Yvonne Brodrechtova from Technical University of Zvolen; Simona Kalinovska and Richard Rehak from 3MON; Yann Semet and Gregoire Boussu from THALES, Publisher: ISCRAM 2023, May 2023
- **Machine Learning and Social Media Harvesting for Wildfire Prevention** by Arif Dwi Laksito, Kusrini Kusrini, Arief Setyanto, Muhammad Zuhdi Fikri Johari, Zauvik Rizaldi Maruf, Kumara Ari Yuana, Gardyas Bidari Adninda, Renindya Azizza Kartikakirana, Fitria Nucifera, Wiwi Widayani from Universitas AMIKOM Yogyakarta, Krishna Chandramouli from Venaka Treleaf, Ebroul Izquierdo from Queen Mary University of London, Publisher: IEEE, July 2023
- **The Use of Domestic Herbivores for Ecosystem Management in Mediterranean Landscapes** by Inês Ribeiro, Vânia Proença from Instituto Superior Tecnico, University of Lisbon, Tiago Domingos from Terraprima and Davy McCracken from Hill & Mountain Research Centre, Scotland's Rural College, Publisher: Global Ecology and Conservation, October 2023
- **Advancement of an Integrated Technological Platform for Wildfire Management through Edge Computing** by Lovorko Marić from Micro Digital Ltd, Krishna Chandramouli from Venaka Treleaf, Jose Ramon Martinez from ATOS, Maria I. Maslioukova, Georgia Christodolou, Konstantinos Avgerinakis and Pavlos Kosmides from Catalink Ltd, Publisher: IEEE, August 2023
- **Security Architecture in the SILVANUS Project** by Natan Orzechowski, Karol Rzepka, Przemysław Szary, Krzysztof Cabaj, Wojciech Mazurczyk from Warsaw University of Technology, Helen C. Leligou from Netcompany-Intrasoft, Marcin Przybyszewski, Rafał Kozik and Michał Choraś from ITTI Sp. z.o.o., Publisher: ACM, August 2023
- **EU Sustainable Forest Management and Wildfire Policies and Practices: Challenges between "As Is" and "To Be" State** by Nikolaos Kalapodis, Georgios Sakkas, Miltiadis Athanasiou from KEMEA, Dimitrios Sykas, Konstantinos Demestichas, Spyridon Kaloduis from AUA, Alexandre Lazarou and Domenica Casciano from Zanasi & Partners, Publisher: RISE-SD
- **Measuring Forest Resilience against Wildfires and Climate Change – Methods and Technical Approaches** by Konstantinos Demestichas, Dimitrios Sykas, Dimitrios Zografakis and Constantina Costopoulou from AUA, Spyridon Kaloudis, Nikolaos Kalapodis, Georgios Sakkas and Miltiadis Athanasiou from KEMEA

There are 13 scientific publications either published or written in this period that directly acknowledge SILVANUS. Combined with the four publications reported in D10.2, there are currently 17 publications highlighting the results of SILVANUS. The project hopes therefore to achieve the KPI of 24 scientific publications within its lifecycle.

2.9 Video

2.9.1 European Competence Offices (BCOs) Network Video on SILVANUS – A Holistic Digital Solution to Wildfire Management

The European Broadband Competence Offices (BCOs) Network, a European Commission initiative, has produced a video about the SILVANUS Project – A Holistic Digital Solution to Wildfire Management in February 2023.

The 3-minute video features interviews with the SILVANUS technical manager Krishna Chandramouli from Venaka Treleaf and project partner Despina Anastasopoulos from Netcompany-Intrasoft. The video was filmed at the General Assembly Meeting in Athens, Greece in December 2022. It includes (among other material) footage from SILVANUS pilot sites in Portugal, Australia and Croatia by SILVANUS partners Terraprima, CSIRO and Croatian Firefighting Association, along with a visual presentation of an IoT device for detecting fire, one of the components of the SILVANUS platform, by project partner Konstantinos Avgerinakis from Catalink Ltd.

The emphasis of the video is on how technology can prove to be a valuable asset to fight and prevent extreme wildfire, and how connectivity in rural and forest areas of Europe is a prerequisite for this digital solution.

This video is part of the European Broadband Competence Offices Network's programme promoting awareness of good practices in broadband projects as well as EU broadband funding and policy.

Figure 84 SILVANUS - A Holistic Digital Solution to Wildfire Management Video

The link is available here: https://www.youtube.com/watch?v=zrs0GcIevDM

2.9.2 SILVANUS Promotional Video – For the Benefit of Forests and Humankind

The new promotional video, featuring work by SILVANUS graphic designer Renato Cotini, has the SILVANUS logo turning from a fire motif to green-colored one, reflecting the key message of the project and its implementation of a wildfire prevention platform. The rest of the footage is focused on the pilots from Indonesia, Portugal and Slovakia.

Figure 85 Excerpt from the SILVANUS Promotional Video

Figure 86 SILVANUS Promotional Video - For the Benefit of Forests and Humankind

2.9.3 SILVANUS Video on the Slovak Pilot Exercise

The three-minute SILVANUS video on the Slovak pilot exercise shows all the organisational aspects and all the equipment (drones, ground robots, Bambi buckets) that were used to execute the fire simulation and technology deployment that will serve as data collected for the SILVANUS platform.

Figure 87 Excerpt from the SILVANUS Slovak Pilot Video

The SILVANUS YouTube channel has seven videos available, from TV news coverages of poster exhibition and pilot exercise from Croatia (available in English subtitles), the EU Green Week webinar recordings, the Slovak pilot report produced by the SILVANUS team, and the promotional videos. The channel has 71 subscribers and in total 2447 views. The BCO video has 362 views.

There are now at least 10 SILVANUS-themed videos available on YouTube and social media with more than 3000 views, which is not counting the aforementioned television coverages. The videos focus on the demonstrated pilot exercises, the promotional campaigns, and on the general overview of SILVANUS. The KPI of having at least three videos produced on SILVANUS results has already therefore been surpassed.

3 Collaboration with Horizon 2020 Coordination Support Action, Green Deal and Innovation Action projects

3.1 EUFireProjectsUnited Initiative

The collaboration of SILVANUS with the H2020 Innovation Action projects (TREEADS, FIRE-RES) and other wildfire management projects (SAFERS, FIRE-IN, FireLinks, FirEUrisk) has been coordinated by the Coordination and Support Action Project Firelogue and continued successfully during the second year of SILVANUS. This cooperation initiative is known under the EUFireProjectsUnited moniker. The main goal of the EUFireProjectsUnited initiative is to identify synergies and overlaps between the various wildfire management projects, to encourage collaboration and to create and improve joint dissemination actions with the Innovation Actions and other wildfire-related projects. There are regular bimonthly meetings occurring between the projects to discuss future endeavours, such as the organisation of joint workshops, panels, and communication campaigns, along with discussions on how to collectively share the findings to make the outputs of individual projects more efficient.

EUFireProjectsUnited issued a newsletter in January 2023, where all of the identified WFRM projects were introduced and common synergies were identified. SILVANUS made its contribution with a brief description of the project.

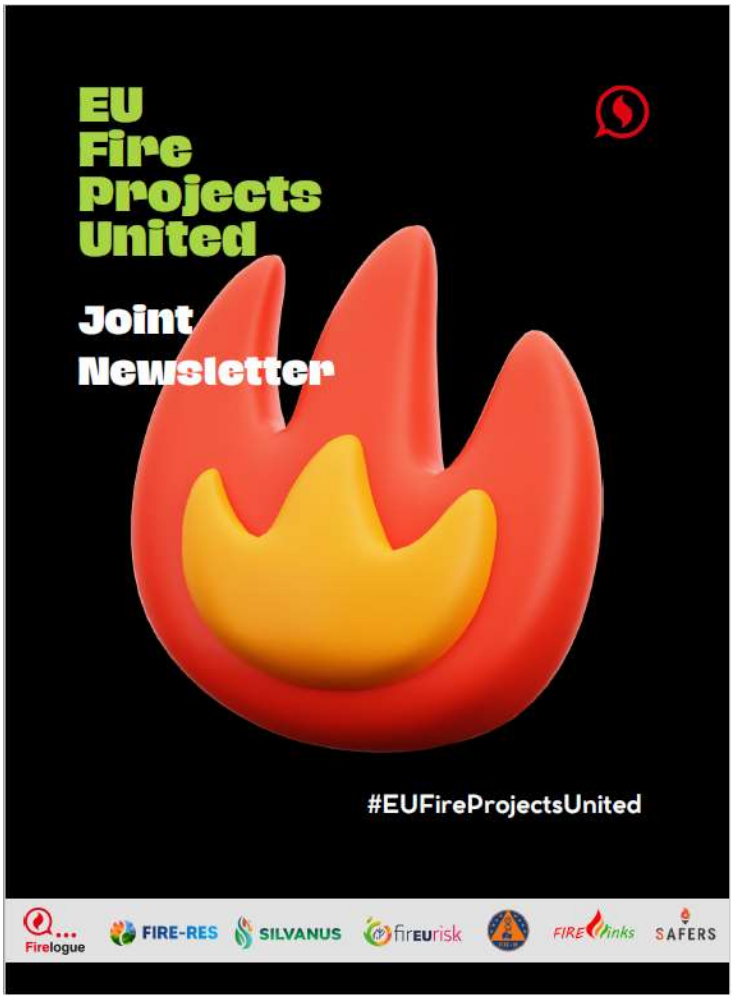


Figure 88 Title Page of the EUFireProjectsUnited Joint Newsletter

Promotional campaigns, developed by Firelogue, were made during the International Firefighters Day on May 4th and World Environment Day on June 5th, where SILVANUS was promoted as one of the projects.

Figure 89 International Firefighters Day Social Media Campaign Poster developed by Firelogue

Figure 90 Social Media Campaign Poster for Happy Environment Day developed by Firelogue

The EUFireProjectsUnited joint dissemination workshop held in January 2023, which was co-organised by Firelogue and SILVANUS (more about this in Chapter 2.1.7).

WFRM project panels were organised for the identification of synergies between respective project outputs and ideas on joint policy development at the International Forest Fire Research Conference in Coimbra (Chapter 2.1.6) and RISE-SD Conference (Chapter 2.1.19). Firelogue has also published a video coverage on the conference in Coimbra, where the SILVANUS coordination team (Michele Corleto, Krishna Chandramouli and Lovorko Marić) were interviewed about the project and its role within the EUFireProjectsUnited initiative. Link to the video, which has 134 views, is available here: https://www.youtube.com/watch?v=JKvhdJ4Qlhc .

Figure 91 SILVANUS Section at the EUFireProjectsUnited ICFFR Video

Figure 92 SILVANUS Coordinator Michele Corleto presenting the project in Coimbra, Portugal

SILVANUS is also included in five thematic working groups (Environment/Ecology, Infrastructure, Insurance, Society and Civil Protection), led by Firelogue, whose aim is to bring together the results of individual WFRM projects in order to formulate joint policy recommendations. Consortium member KEMEA is leading the infrastructure working group. Consortium member HRT was present at the meeting of the Working Groups between the 4th and 7th of July, 2023 in Solsona, Spain. The purpose of the event was to discuss the different topics proposed by each Working Group (WG) and to have the opportunity to meet expert participants and Firelogue members, promoting networking and knowledge exchange.

During the 3-day workshop, WG-experts focused their attention toward identifying central issues at the core of their WG topics, work toward finding possible solutions, while also continuing to learn from each other and network with other experts and members of Firelogue. There were 75 participants at the meeting from the WFRM projects. The agenda included the presentation of landscape fire governance framework, the Wildfire Action Plan and peer review assessment framework, and justice dimension towards integrated wildfire risk management within the wildfire risk management governance context. This was an important milestone in formulating future policy recommendations in the fight against extreme wildfire.

3.2 Green Deal Support Projects Office

The Green Deal Support Projects Office, as explained in Deliverable 10.2, was established to facilitate coordination between projects under the H2020 Green Deal Call and to maximise their positive impact in the long term. GDSO is supporting 73 Green Deal Call projects organised into 5 working groups:

- Climate Change and Biodiversity
- Clean Energy
- Urban Environment and Mobility
- Food and Health
- Knowledge and Citizens

SILVANUS is actively contributing to the joint activities coordinated by the Green Deal Support Projects Office as part of the Climate Change and Biodiversity Working Group. There are 17 projects in this WG working on climate change adaptation, mitigation and biodiversity preparation. 450 organisations are included, which gives SILVANUS a much larger stakeholder pool that goes beyond the scope of wildfire management yet stays within the climate change and biodiversity framework.

SILVANUS was presented as a success story at the Green Deal Projects Support Office workshop, as explained in Chapter 2.1.22. A video that introduces SILVANUS as an example of a successful project within the GDSO's Climate Change and Biodiversity Working Group (out of 17 projects that are focusing on climate change mitigation and adaptation, and the preservation of biodiversity), was published on the GDSO YouTube channel. The link is available here: https://www.youtube.com/watch?v=Y-kaQBePphg.

Figure 93 Excerpt from the GDSO video on SILVANUS

4 Stakeholder Engagement and External Advisory Board Update

SILVANUS approach to stakeholder engagement is defined through four dimensions:

The first is the general stakeholder outreach through the dissemination of project results through regular channels such as website, social media, event presentations, newsletter distribution, press and TV coverage, etc.

The second dimension is the established contact with the External Advisory Board, whose members are directly and continuously influencing the project with their constructive feedback.

The third aspect is the inclusion and selection of close external stakeholders who were chosen by SILVANUS project partners. These external stakeholders are a basis for the future formation of Sustainable and Resilient Working Groups that will serve as extensions of the EAB.

The fourth dimension consists of direct contacts established through the SILVANUS website contact form, who express a specific interest in the project results and how their line of work can help the success of SILVANUS platform's implementation.

The external stakeholder list was divided according to the stakeholder target groups as defined in D10.1. As of September 2023, there are 119 external stakeholders (including the External Advisory Board) – either named individually or by the organisation. Depending on the level of interest, these external stakeholders will serve a basis for the formation of Sustainable and Resilient Forest Working Groups. External stakeholders are those stakeholders who can be directly contacted and who are familiar with the outputs of SILVANUS. Newsletters and other important project updates are sent to these stakeholders directly without using channels such as the website and social media. Figure 94 shows the stakeholders within the target groups. Some of the most represented target groups are research organisations, policy makers, firefighting associations, civil society organisations and forest governance associations.

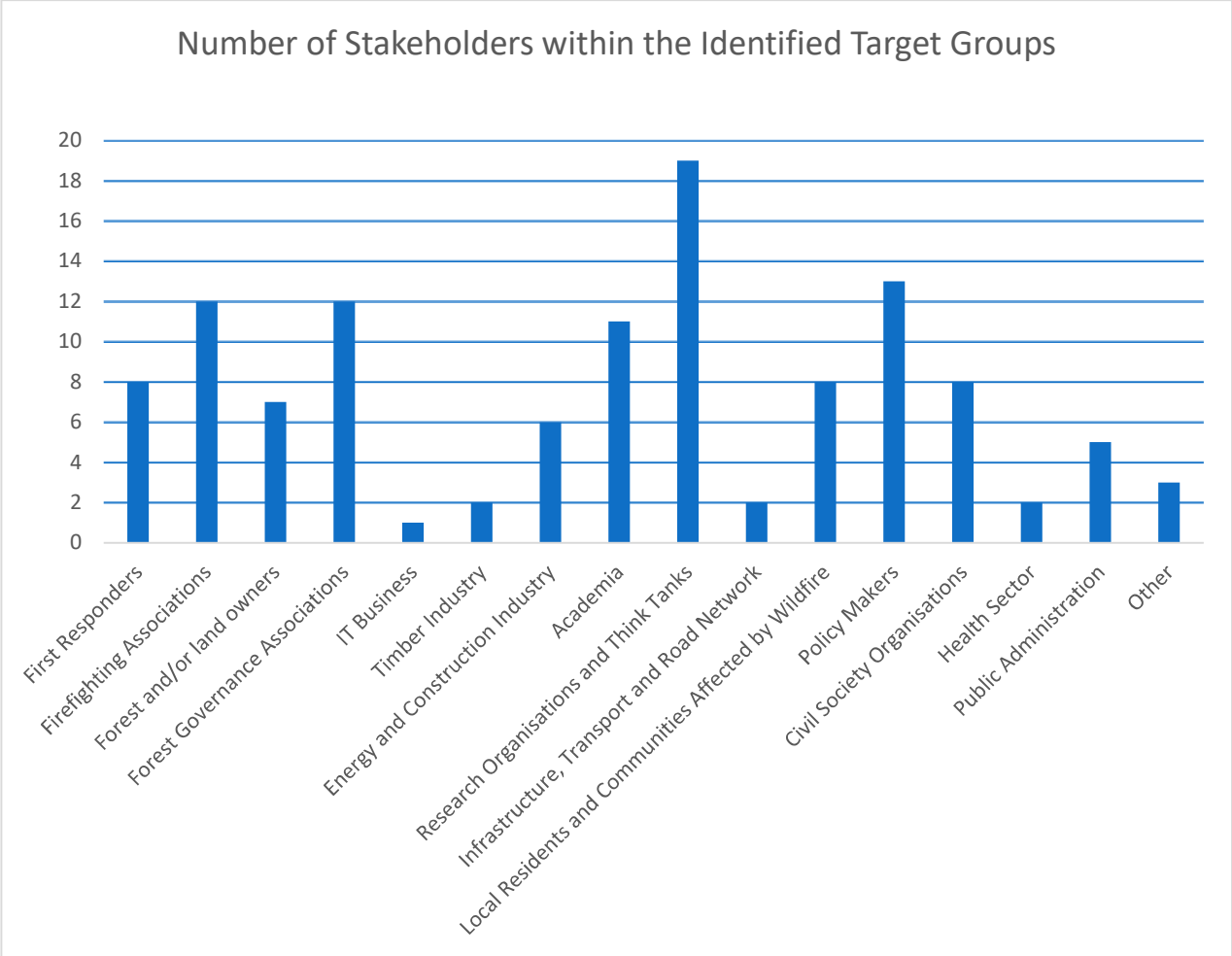


Figure 94 SILVANUS External Stakeholders Divided by Target Groups

According to the matrix of stakeholder impact, depicted and explained in Deliverable 10.1, there are four types of stakeholders with:

- High Influence / High Interest
- High Influence / Low Interest
- Low Influence / High Interest
- Low Influence / Low Interest

Figure 95 depicts the percentages of influence and interest among external stakeholders and interest. Two thirds of external stakeholders have both a high influence and high interest in the project, followed by high interest and low influence at 26 per cent. The latter category often applies to local residents and communities affected by wildfire. Low interest and high influence category is represented with 5% (certain industry and civil society stakeholders that need to be persuaded by the results of SILVANUS to be more invested in the project). Low interest and low influence are the rarest ones, albeit one of the goals of SILVANUS is to also bring these stakeholders into other categories.

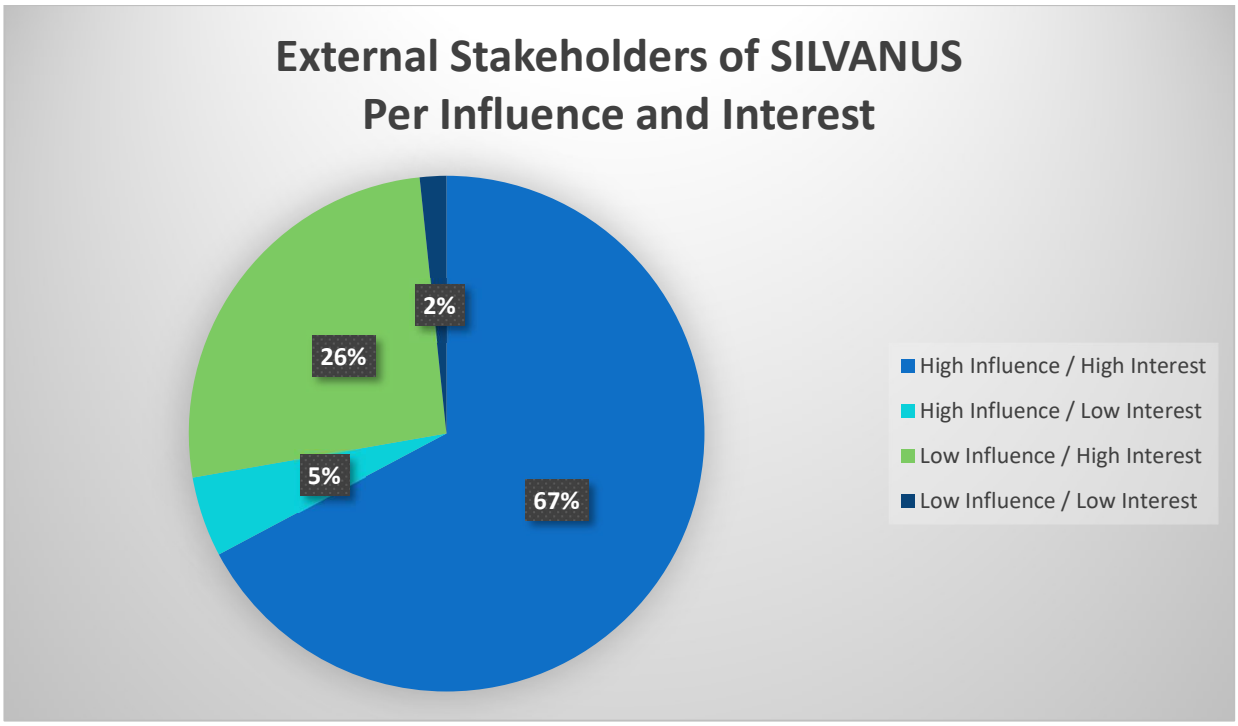


Figure 95 External Stakeholders of SILVANUS Per Influence and Interest

The following figure (Figure 96) shows the number of stakeholders and the types of relationship to the SILVANUS consortium, namely:

- Strong (no to little effort needed) - 54
- Medium (some effort needed) - 63
- Weak (to be built) - 2

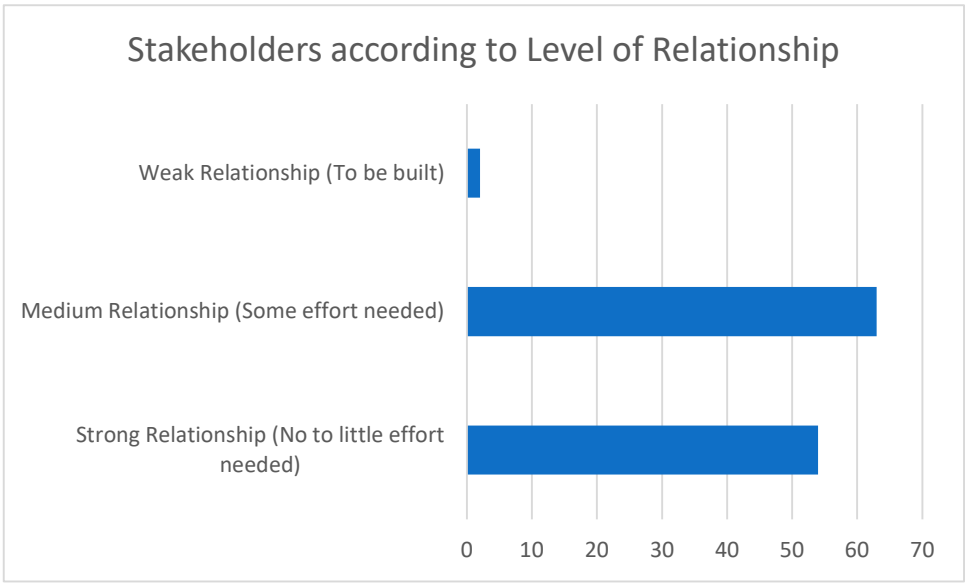


Figure 96 SILVANUS Stakeholders according to the Level of Relationship

The number of external stakeholders from the public sector is 86, from private 19, while from public-private partnership is 4, as shown in Figure 97.

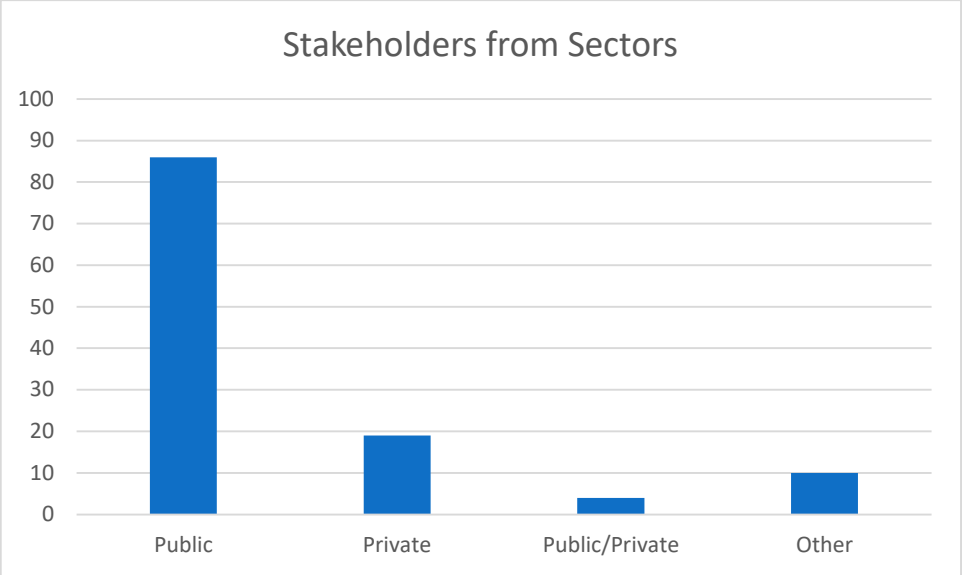


Figure 97 Number of External Stakeholders Per Sector

Table 2 shows the number of external stakeholders per country of origin. The highest number of stakeholders come from those countries that are very much affected by extreme wildfire, such as Greece (29), Portugal (15) and Croatia (14).

Table 2 Number of Stakeholders Per Country of Origin

Australia	2
Brazil	1
Croatia	14
Cyprus	4
Czechia	4
France	2
Greece	29
Hungary	3
Indonesia	3
Ireland	1
Italy	7
Japan	1
Poland	9
Portugal	15
Romania	3
Slovakia	7
Sweden	9
United Kingdom	3
European Union	2

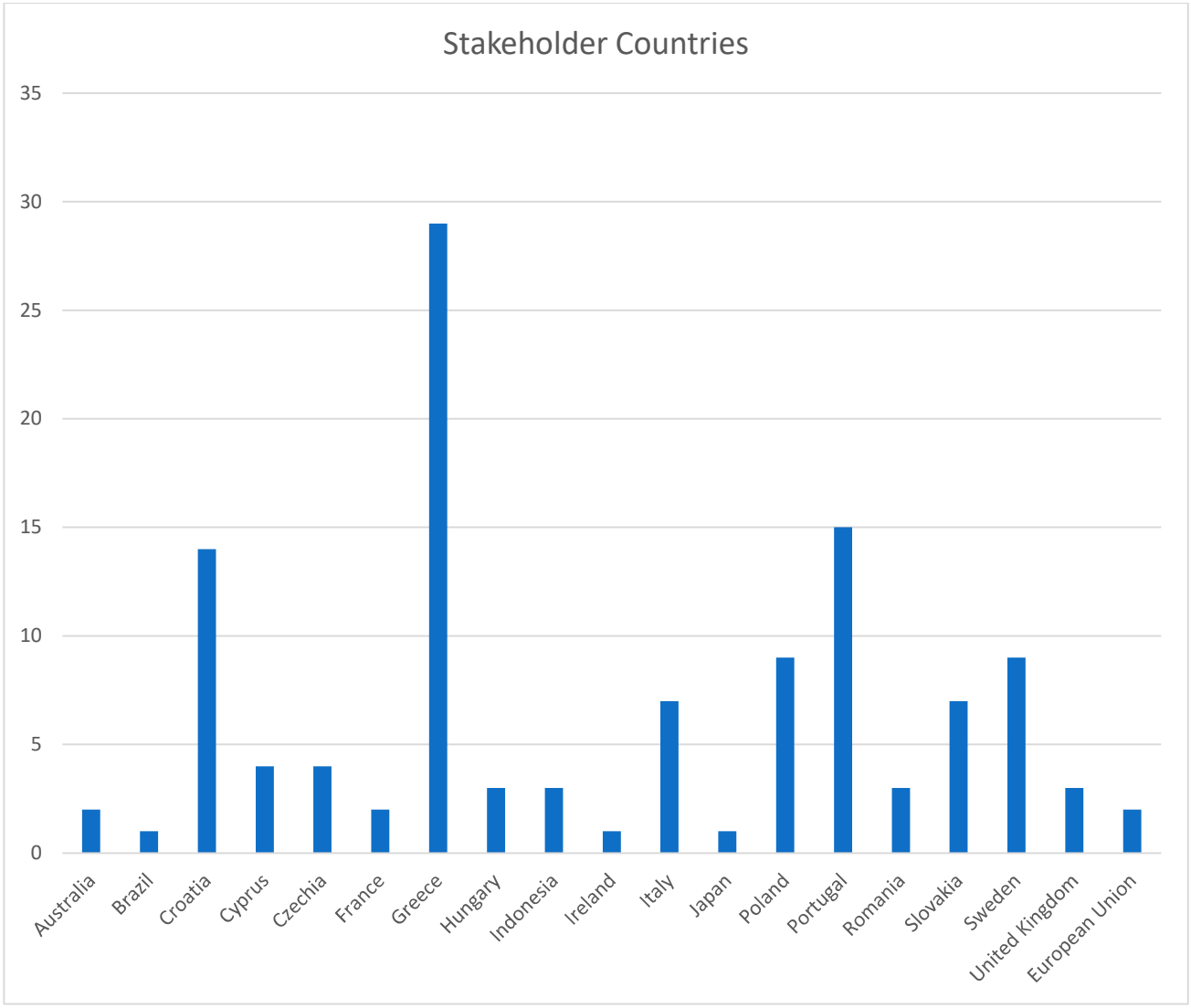


Figure 98 SILVANUS External Stakeholders per Country of Origin

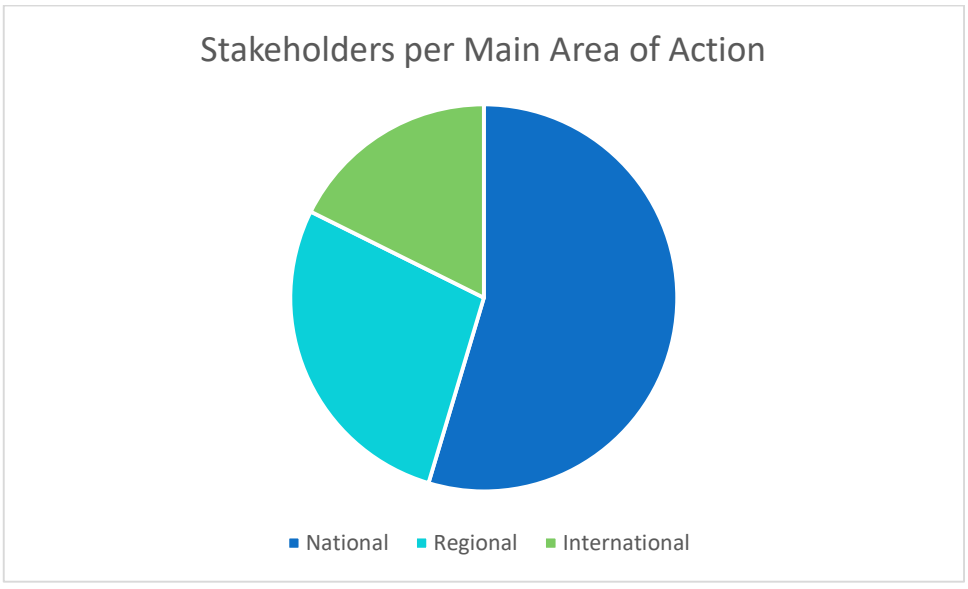


Figure 99 Number of External Stakeholders per Main Area of Action

The SILVANUS Consortium has deepened the relationship with the External Advisory Board members by establishing regular contact and receiving constructive feedback on the user products and on the general development of the project. At the General Assembly meeting in Athens in December 2022, three EAB members were present – Andy Elliott from WildfireTAC, United Kingdom, who offered his experience as a first responder and had crucial feedback for the platform from the perspective of a firefighter; Michela Bertolotto from the University College Dublin, who offered academic insights into the terminology of the platform; and Igor Stankić from Croatian Energy Institute Hrvoje Požar in Zagreb, Croatia, who shared his insights on the influence of the SILVANUS platform on the safety and endurance of energy infrastructure. This gave important perspective on the possible gaps in SILVANUS platform development. The cooperation will continue in the future and EAB members will have the opportunity to attend the SILVANUS platform pilot exercises.

Figure 100 The EAB session at the SILVANUS GA Meeting in Athens - Andy Elliott from WildfireTAC Addressing the Audience

5 Centre for Adaptation Strategies and Development (CASD) – Current Status

5.1 Goals and Activities of CASD

The Centre for Adaptation Strategies and Development (CASD) is conceived as a global think tank initiative tasked with the objective of establishing an "European Centre of Excellence for Adaptation Strategies, Awareness and Management of Natural Resources". The scope of this centre of excellence will include the establishment of sustainability of knowledge transfer generated within SILVANUS and from other collaborative projects. This will lead to the creation of consulting activities on wildfire management and sharing knowledge on integrated fire management practices that will serve as a catalyst in the prevention, detection, response coordination, and restoration of European forests. During the previous year of the activity, a Management Board has been established under the leadership of TUZVO, thus achieving an important milestone as proposed in the project. The CASD will act as a hub to transfer knowledge available from the SILVANUS project and further facilitate the creation of new knowledge on integrated wildfire management to all relevant SILVANUS stakeholder target groups, in order to ensure the sustainability of the project.

The aim of CASD is twofold:

- To pursue a horizontal research and development integration by bringing together a group of diverse experts from fields such as biodiversity restoration, visual analytics, artificial intelligence, big data mining, robotics, advance computing, human computer interaction, socio-economic analysis of wildfire phenomenon and human factors, etc. The SILVANUS platform will serve as a hub or the connecting tissue for the integration of related technological outputs
- To address the vertical component that entails the integration of disparate stakeholder target groups such as firefighters, first responders, civil protection workers, forest and landowners, forest governance associations, energy sector, timber industry, policy makers, etc.

Among current activities, the consortium is in the process of drafting a white paper titled "The European Centre of Excellence for Adaptation Strategies, Awareness and Management of Natural Resources - towards Sustainability within SILVANUS Project and Beyond". The white paper is prepared by a Task Force, consisting of VTG, KEMEA, MD, and TUZVO, that has been established within the project to formally organise the scope, operations, and governance of the European centre for excellence. The Task Force has organised regular meetings, reviewing the relevant proposals on business activities, operations and procedures of integrated wildfire management services to be carried out by stakeholders. This is one of the main building blocks for the creation of a CASD business plan, which will be written and submitted as a Deliverable (D10.7 - Self-sustainability Business Plan for CASD) at the end of SILVANUS (in M42). Activities that are under consideration to be included within a business model of CASD are:

- Maintaining and updating the envisaged SILVANUS technological platform
- Creation of a European forum in the field - emulating other successful forums in other sectors of the European endeavour
- Academia – Industry matchmaking
- Technology transfer to end users
- Technology transfer to SMEs
- Facilitating mentoring, coaching and training
- Shaping national and European research agendas.
- Continuous monitoring of relevant technology and market trends developing outside the centre at large
- Policy recommendations
- Organisation of workshops, seminars, trainings and courses
- Assistance to grants and other applications

These activities will be further elaborated and clarified leading to specific business-related actions, with an overall structure of the CASD business plan divided into policy recommendations, detailed description of processes and operations, an overview of governance, and a business model that will ensure the existence of SILVANUS results far beyond the duration of the project.

5.2 Consultation on Governance Structure and Operations of CASD

In the current state, the creation of CASD led by TUZVO has been approved by the Academic Senate of the Technical University of Zvolen in Slovakia. The overall management and administration of CASD activities are managed by the Centre Coordinator Prof. Bc. Ing. Andrea Majlingová, PhD., MSc., while the day-to-day administrative activities are managed by the Centre Administrator Ing. Lenka Marcineková, PhD.

The ongoing activities of CASD include the support extended for carrying out relevant activities related to the development of new tools and strategies to manage forest fire risks and increase the resilience of forests to the impacts of climate change by integrating the experience, expertise and knowledge of stakeholders, i.e., foresters, conservationists, firefighters, municipal representatives and others. Among the objectives of the Centre, promoting cooperation in combating forest fires is to be emphasised, in particular in promoting objectives and establishing cooperation, providing information on scientific and professional events in Slovakia and abroad, assistance in registration, promotion of partners and their products and services abroad.

One of the first activities of the Centre focused on the organisation of the Slovak pilot exercise in the Pol'ana region in Central Slovakia between April 24th and 26th, 2023. On April 26th, the CASD organised a workshop related to the demonstration of pilot results, which was attended by 43 stakeholder representatives. The workshop participants included representatives from the Ministry of Agriculture and Rural Development of the Slovak Republic and the Ministry of Environment of the Slovak Republic. Representatives of Forests of SR, S.E. were also present, along with foresters from the Pol'ana forest management unit, representatives of the Association of Owners of Communal and Private Forests, state nature conservation workers representing also the Pol'ana Biospheric Reserve workers, professional and volunteer firefighters as well as civil protection representatives, representatives from the municipalities situated in the vicinity of the Pilot study territory.

The programme of the workshop consisted of i) presentation of the SILVANUS project to the regional and national stakeholders; ii) providing the summary of the integrated fire management demonstration carried as a part of the Slovak pilot study; iii) elaborating on the impact of technologies and shortcomings of SILVANUS tools that have been deployed; iv) discussion about forest fire risk management under climate change in enabling prevention and preparedness of the forest regions. The workshop was ended by presenting the conclusions on the results of the pilot study and outcomes of the workshop. The knowledge gathered has been disseminated among the consortium partners.

The Round Table on the Cooperation in the Forest Fire Risk Management in Slovakia, described in Section 2.1.24, included activities of the Slovak CASD. The meeting was organised by TUZVO and there were participants from the Slovak Ministry of Agriculture and Rural Development, National Forest Centre, Ministry of Interior, Fire and Rescue Service, and the Slovak CASD. From the discussion related to the presentation of the holistic approach to wildfire risk management, i.e., introduction of methodologies that are available at TUZVO, it was stated that those are not used in forestry and fire protection practice. An interest for their implementation was confirmed by both sides. The discussion was concerned further with looking for measures to prevent the wildfires caused by the human activities (deliberate, negligence). In this case, proof is almost impossible, and a block fine is insufficient. A legislative amendment is needed. The discussion resulted in a consensus between HaZZ and NLC on the need for more awareness, education, and preventive educational activities of the population (especially children) in the field of fire and safe

behaviour. Suggestions were made for the use of television, lectures at schools and other facilities, the use of interactive aids (jigsaw puzzles, games, puzzles, etc.). Therefore, proactive forest management will not only reduce the number of forest fires, but also speed up intervention in the event of a fire that has already occurred. In this view, the forest roads accessible to machinery are very important for intervention activities.

The discussion also highlighted the need to develop a systematic approach in terms of integrated landscape management. However, it is not enough to create a system, but it is necessary to ensure its sustainability to be able to rely on such a system. It is thus necessary to identify the financial means for its operation and maintenance in the future. This is where the problem of lack of funds often arises. The lack of financial support also makes it difficult to use existing methodologies and already available data.

The measures, that are currently implemented mainly in forest stands, would need to be extended further into the wildland/ open country. This would require the involvement of other partners. The need to involve the facilitator supporting the cooperation between the Ministry of Interior and Ministry of Agriculture in the efforts to establish the Framework Agreement was identified.

CASD became this facilitator and has started the processes to develop and sign the Framework Agreement on Cooperation between the Ministry of Agriculture and Rural Development of the Slovak Republic and the Ministry of Interior of the Slovak Republic, which will allow free of charge interchange of any relevant data and geospatial data between foresters and firefighters in the future. CASD helps firefighters in specification of requirements related to data which are provided to foresters and vice versa.

Following the positive feedback and the constructive engagement with the stakeholders organised in Slovakia, the management committee of CASD has agreed to have further meetings on a quarterly basis to review the project progress periodically. The organisation of CASD will consider encouraging the participation of representatives from crisis management and civil protection authorities, environmental protection, etc. will be involved in the discussion.

Next meeting is planned on the beginning of autumn 2023, which will further extend the conclusions and provide additional measures to achieve breakthroughs in wildfire prevention. This is an example – on a national level - of how the CASD may serve as a liaison and a consultant in knowledge-sharing on wildfire management among the most important stakeholders. The plan for the Centre is to have in the long-term an international and all-encompassing approach, which will have a wide stakeholder outreach in the EU and beyond.

6 Exploitation Plan for SILVANUS Platform Activities – Second Status Report

6.1 Exploitation Plan

This is the second report of the exploitation plan implementation progress, within D10.3 of SILVANUS.

On the basis of the Initial exploitation plan reported in D10.2 [1], the objective here is to report the progress on the project exploitation plans, that will offer recommendations for SILVANUS consortium members to undertake, that will enrich the scope SILVANUS project results in targeting the commercial needs of the wildfire management and forest landscape management solutions. The recommended actions will include the need for sustainability of SILVANUS components beyond the scope of the project to be able to reach a high Technology Readiness Level (TRL) solution.

This plan is conceived to conduct an effective transfer to the market of the project developments. As a living document, it will be updated with the relevant changes coming from a twofold approach: both consortium (partners and technologies) and the market & stakeholders.

In detail, the objectives of this document are:

- To identify the project's exploitable items from both perspectives:
  - Commercial
  - Non-commercial
- To describe the joint and individual exploitation plans.
- Set up the base lines for a sustainable exploitation strategy.

As per the defined exploitation plan, the steps and the progress are depicted in Figure 101 below, where the initial phase for the Identification of exploitable items has been fully accomplished, while the following phases are progressing.

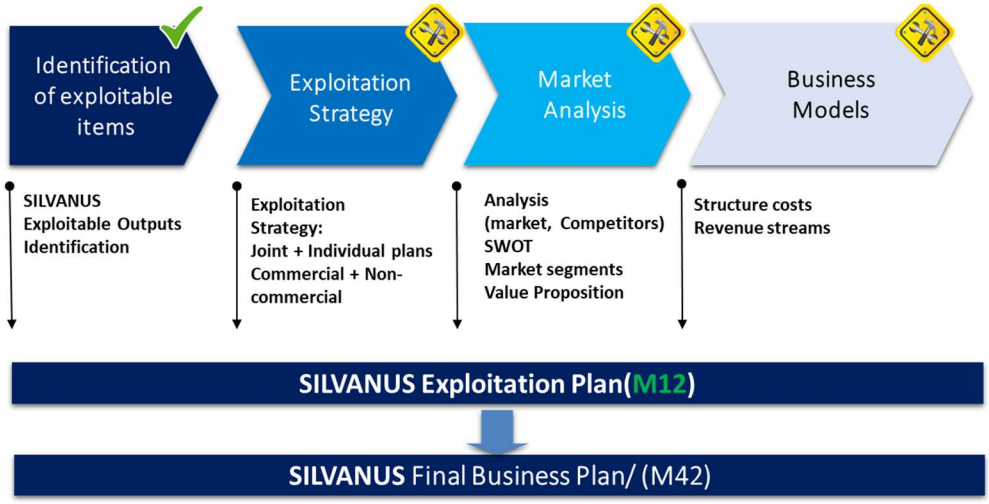


Figure 101 SILVANUS exploitation and business strategy

The next updates on this D10.3 will be provided in D10.4 and D10.6. Each iteration will include additional progress to the project business activities identified in the roadmap above.

6.2 Exploitable Items

In D10.2 [1], the different types of exploitable items were described, that project partners can decide to exploit as a response to stakeholder needs. Here below, in Table 3, a summary of typologies of exploitable results that individual partners can decide to include in their exploitation plans.

Table 3 SILVANUS exploitable results

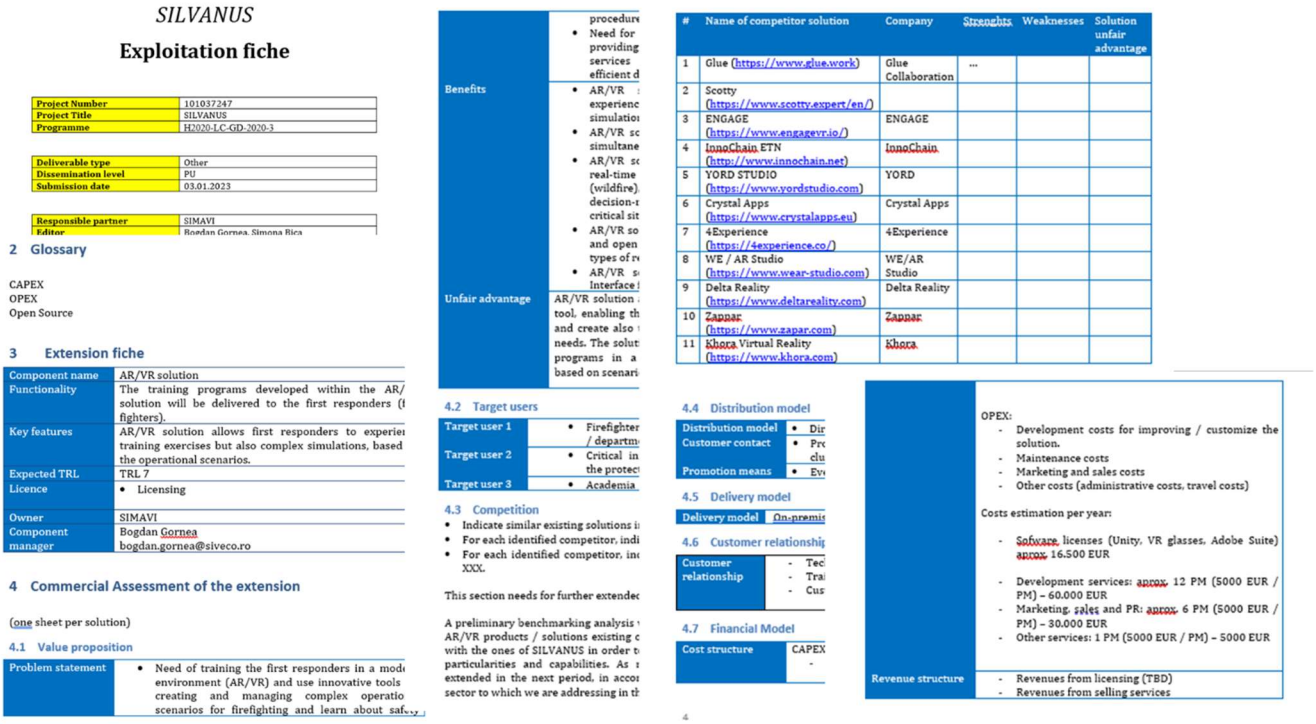
Commercial exploitation	Non-commercial exploitation
• **Software/Developments** ▪ **SILVANUS platform (as a whole)** ▪ **SILVANUS components (sole components)** • **Services built around the SILVANUS solutions** • **Knowledge (Know how)** ▪ **Training (tailor made courses)** • **Brand. SILVANUS as a market reference**	• **Knowledge (Know how)** ▪ **Training** ▪ **Re-use of results in other projects**

The focus, so far, has been to provide the information for the eight User Products (UPs), as described in report D8.1 [2]. In terms of results from the SILVANUS platform perspective, these UPs are Minimum Viable Products (MVPs), and have been described following the template for the Exploitation Fiches that was provided in the first period and described in the previous report. Table 4 shows a summary of the MVP descriptions that have been provided by the corresponding partners leading and contributing to those products.

Table 4 SILVANUS MVPs & User Products

UP #	MVP Tool Name	Owner	Expected TRL	Type of License	License name
UP1	**AR/VR training toolkit for trainers**	SIMAVI	TRL 7	TBD	TBD
UP2	**Fire danger tool**	CMCC	TRL 8	TBD	TBD
UP3	**Fire detection based on social sensing**	CERTH	TRL 7	Permissive	Apache 2.0
UP4	**Fire detection from IoT devices**	CTL	TRL 7	Proprietary	NA
UP5	**Fire inspection using UAVs and UGVs**	CSIRO/TRT/3MON	TRL 9	Proprietary	NA
UP6	**Fire spread forecast**	EXUS	TRL 7	Proprietary	NA
UP7	**Biodiversity profile mobile application**	VTG	TRL 7	Permissive	2-Clause BSD Apache 2.0
UP8	**Citizen's engagement programme using mobile app**	MDS	TRL 8	Proprietary	NA

Below in Figure 102 can be found a thumbnail of the UP1 exploitation fiche. The full exploitation fiches for the eight MVPs can be found in Annex I – Exploitation fiches. Besides, to these User Products, some partners are also planning to exploit some individual assets, which will be reported in the next period.



SILVANUS

Exploitation fiche

Project Number	101037247
Project Title	SILVANUS
Programme	H2020-LC-GD-2020-3
Deliverable type	Other
Dissemination level	PU
Submission date	03.01.2023
Responsible partner	SIMAVI
Editor	Bogdan Gornea, Simona Rica

2 Glossary

CAPEX
OPEX
Open Source

3 Extension fiche

Component name	AR/VR solution
Functionality	The training programs developed within the AR/ solution will be delivered to the first responders (f fighters).
Key features	AR/VR solution allows first responders to experie training exercises but also complex simulations, based the operational scenarios.
Expected TRL	TRL 7
Licence	• Licensing
Owner	SIMAVI
Component manager	Bogdan Gornea bogdan.gornea@siveco.ro

4 Commercial Assessment of the extension

(one sheet per solution)

4.1 Value proposition

Problem statement	• Need of training the first responders in a mod environment (AR/VR) and use innovative tools creating and managing complex operatio scenarios for firefighting and learn about saf...
Benefits	procedur • Need for providing services efficient d • AR/VR experienc simulatio • AR/VR sc simultane • AR/VR sc real-time (wildfire) decision-r critical sit • AR/VR so and open types of r • AR/VR s Interface
Unfair advantage	AR/VR solution tool, enabling th and create also needs. The solut programs in a based on scenari

4.2 Target users

Target user 1	• Firefighter / departm
Target user 2	• Critical in the protec
Target user 3	• Academia

4.3 Competition

- Indicate similar existing solutions i
- For each identified competitor, indi
- For each identified competitor, inc XXX.

This section needs for further extendec

A preliminary benchmarking analysis AR/VR products / solutions existing c with the ones of SILVANUS in order t particularities and capabilities. As extended in the next period, in accor sector to which we are addressing in th

#	Name of competitor solution	Company	Strenghts	Weaknesses	Solution unfair advantage
1	Glue (https://www.glue.work)	Glue Collaboration	...		
2	Scotty (https://www.scotty.expert/en/)				
3	ENGAGE (https://www.engagevr.io/)	ENGAGE			
4	InnoChain ETN (http://www.innochain.net)	InnoChain			
5	YORD STUDIO (https://www.yordstudio.com)	YORD			
6	Crystal Apps (https://www.crystalapps.eu)	Crystal Apps			
7	4Experience (https://4experience.co/)	4Experience			
8	WE / AR Studio (https://www.wear-studio.com)	WE/AR Studio			
9	Delta Reality (https://www.deltareality.com)	Delta Reality			
10	Zappar (https://www.zappar.com)	Zappar			
11	Khora Virtual Reality (https://www.khora.com)	Khora			

4.4 Distribution model

Distribution model	• Dir
Customer contact	• Pr clu
Promotion means	• Ev

4.5 Delivery model

Delivery model	On-premis

4.6 Customer relationshi

Customer relationship	- Tec - Tra - Cus

4.7 Financial Model

Cost structure	CAPEX -
	OPEX: - Development costs for improving / customize the solution. - Maintenance costs - Marketing and sales costs - Other costs (administrative costs, travel costs) Costs estimation per year: - Software licenses (Unity, VR glasses, Adobe Suite) aprox. 16.500 EUR - Development services: aprox. 12 PM (5000 EUR / PM) – 60.000 EUR - Marketing, sales and PR: aprox. 6 PM (5000 EUR / PM) – 30.000 EUR - Other services: 1 PM (5000 EUR / PM) – 5000 EUR
Revenue structure	- Revenues from licensing (TBD) - Revenues from selling services

Figure 102 SILVANUS UP1 exploitation fiche

6.3 Individual exploitation

6.3.1 Individual exploitation plans

Based on the template for the individual exploitation plan, as defined in the previous period and reported in D10.2 [1], and after some awareness-raising work, most of the partners have completed and provided their individual exploitation plans. The partners' exploitation plans are aligned with their corresponding assets and activities undertaken in the SILVANUS project, according to their profiles, as there are partners with a diversity of backgrounds and domains (industrial partners, academic and research partners).

So far, thirty-eight partners have provided their individual exploitation plans. Partners still have the chance to contribute with their outstanding plans or update the plans already submitted.

As an example, Catalink partner plan can be found below. Annex II – Individual exploitation plans, contains the plans from 38 partners received so far.

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** Catalink (CTL) Limited is a software development SME founded in 2017, in Nicosia, Cyprus. The company has established a multi-disciplinary team, offering expertise in data science, machine learning, semantic technologies, multimedia analysis, decision making, as well as project management. Catalink engineers deliver cutting-edge solutions for learning and reasoning from incomplete, large and heterogeneous sets of data, delivering solutions for trends prediction, anomaly detection, and situation awareness. Under this umbrella CTL has designed CASPAR, a domain agnostic framework for the automated retrieval & fusion of heterogeneous enterprise data into domain-specific semantic models, to enable the discovery of new knowledge & facilitate the extraction of actionable insights.

The company has also cultivated broad expertise in computer vision, image processing and multimedia applications, such as human activity recognition, driver monitoring, fleet management and traffic management from wearable and surveillance cameras (CCTV), as well as semantic segmentation for crisis event detection in visual content based on content-based image retrieval and dynamic texture recognition. Under this concept, CTL has developed a smartphone application, named IRIS for the continuous monitoring of the state of a driver during the whole duration of a driving session. The application detects the face of the driver, extracts the facial landmarks and estimates the drowsiness of the driver based on how long the eyes are kept closed and the frequency of yawning, raising an alarm when necessary.

Catalink places emphasis on its R&D activities, rendering them the foundation of its service and product portfolio. Its members have strong experience in successfully carrying out research in ICT at both national and international level. Catalink has established synergies with several stakeholders from industry and academia, which guarantees its ability to always deliver novel, cutting-edge and high-quality research activities.

2. Your motivation to participate in the project and commitment:

Catalink's motivation to participate in SILVANUS project is to design and develop highly customable software for stakeholders that want to fight forest fires with the use of Artificial Intelligence (AI) and semantic reasoning. For that purposes Catalink targets at contributing to SILVANUS with cutting edge AI tools, as well as IoT devices and semantic reasoning. AI tools will deal with the early detection of fire forest with the detection of fire and smoke particles within images and videos taken from CCTV cameras, social media and UAVs. A Raspberry PI will be used as a gateway to enable the communication between the edge devices and cloud. Last but not least, a semantic reasoning framework will be provided to the partners so that the platform may connect all pieces together and make sophisticated decisions by leveraging semantic reasoning.

3. Means to achieve your objectives:

Catalink Ltd possess all the necessary resources in order to achieve the aforementioned activities. More specifically, the company is located in a modern building in Nicosia, fully renovated so that it can satisfy CTL activities; namely 2 servers for storage and communications purposes; 1 cluster of GPUs to deploy the aforementioned services and products; several laptops and personal computers. The company has also secured several governmental and private capitalist schemes that facilitate the functioning of the company, followed by a carefully designed well-balanced cost structure. As far as the personnel is concerned, CTL employees highly experienced management leaders, experienced software engineers, and boasts that is sustains a satisfactory communication channel with target customers.

4. Opportunity which appeared/appears:

Our participation **is SILVANUS** is the result of the real need of Cypriot and Greek customers (for industrial partners), such as policy makers, firefighters, public authorities and companies that develop AI and ICT tools to help them deal with the raising problem of detecting and extinguishing fires in these areas.

Market growth in the development of AI tools that detect new fire events and notify the respective people to extinguish them is significantly increasing, creating favorable prospects for profit. Furthermore, the competition in fire detection market is quite low, as the problem has recently raised so much attention and there are not so many companies that develop this kind of technologies so intensively. Contrary to previous decades, the legal and political environment is quite healthier in both local and international markets, allowing data acquisition and manipulation in remoted forest areas. Last but not least, there are a lot of indications that the positive trend that raised the last year in the market will continue next years and promises a prosperous future for companies that want to delve more into fire detection AI tools, that leverage IoT technologies and semantic reasoning frameworks.

WHAT AND WHY	**5. Exploitable assets and results:** Catalink Ltd aspires to develop a great dealt of AI tools and IoT devices that will be used to detect and spot the ignition of fires in wild forests. The company will be able not only to leverage the AI tools as a set of services for detecting and spotting fire forest but will also be able to exploit them individually by selling it in ICT companies to merge them as an ad-hoc asset. Catalink also aspires to leverage the semantic reasoning framework that will be used to fuse all information together and extract semantic knowledge out of multiple sources. Last but not least, an IoT device will be encapsulated in a portable kit that could seamlessly deployed in desired areas.
	6. Rationale: We are interested on developing AI, IoT and semantic reasoning assets, with specific attention on the development of the portable kit that will contain a lightweight version of the AI tools, not only in order to get profit from them but also to help modern societies and puclic authorities to deal with the alarming raising of fire events worldwide. Most of the aforementioned assets will be exploited industrially by selling them individually in companies that also work on this domain or by merchandizing the IoT kit.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: **CTL** expects to collaborate with several industrial partners from SILVANUS project, such as DELL and INTRA, in order to encapsulate the edge fire detection component in lightweight and portable kit and merchandize it with its customers in Cyprus and Greece. There is also the possibility to form a joint spinoff with other SILVANUS partners after the end of the project and leverage a potential asset that might have been developed by more than one partners. Potential collaboration with universities might also be considered so that the company may exchange knowledge with domain experts and further advance the aforementioned assets.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** The roadmap will include the final development of the exploitable assets, validation testing, updates to the prototype based on the outcomes from the validation test, and finally marketing and sales within the initially targeted markets. **CTL** plans to release the aforementioned exploitable assets mainly in Greek and Cypriot public authorities, first responders and ICT companies that develop similar technology. We plan to meet with the target stakeholders as soon as we have a Minimum Value Product (MVP), possibly due on M30 of Silvanus project. Demonstration and update cycles are expected to follow before proceeding with the first agreement with any of the target stakeholders. Further investigation of international target stakeholders will follow in order to upscale clientele.
	9. Measurement: The impact of the planned actions will be measured the last year of the project by setting up appropriate Impact indicators including: i) The size of the stakeholders that we have approached and demonstrated our exploitable assets (at least 10 users); ii) The number of Products, Processes and Methods that will follow the introduction of our exploitable assets; iii) The start-ups and/or spin-offs that have been jointly created with other SILVANUS partners and are expected to be commercialized after the end of the project; iv) the consultations that have followed the release of CTL's exploitable technologies, modules and platforms and provided to interested parties.
	10. Positioning: Currently, there is no competition in Greece and Cyprus that provides ready-to-install solutions to detect fire incidents in forests.

Table 5 Individual Exploitation Plan of 3MON (example)

6.4 Joint exploitation

6.4.1 Intellectual property rights (IPR)

In this period, the consortium had been working in the IPR agreement. The agreement was distributed to the consortium partners, while in parallel further discussions have been done in terms of IPR percentage distribution for the Minimum Viable Products (MVPs) among the contributing partners for each MVP. So far, the text of the agreement has not been changed from what was provided in D10.2.

Additionally, further work has been performed in terms of IPR percentage distribution. This work will continue during the next period. A preliminary version of the IPR percentage distribution is available, although not completely confirmed yet for all the MVPs, as it is included here in Table 6 below.

For UP2, UP3, UP4 and UP6, the IPR percentage distribution has been confirmed by the corresponding partners. For UP1, UP5 and UP7 confirmation is yet pending. For UP8, the current IPR percentage distribution is based on partners' current efforts, but close to the end of the action it will be updated with a fair distribution considering not only partners' efforts but also the data provided by the corresponding content providers.

In Annex III – IPR agreement, it can be found the reviewed version of the IPR agreement, including the revised IPR distribution.

Table 6 IPR distribution for MVPs up to M24

Name of component	Lead developer	Contributing parties	IPR %
UP1 – AR/VR training toolkit for trainers [1]			
	SIMAVI		100%
UP2 – Fire danger tool [2]			
	CMCC		100%
UP3 – Fire detection based on social sensing [2]			
	CERTH		35%
		UISAV	24%
		HB	13%
		CTL	8%
		WUV	8%
		EAI	6%
		AMIKOM	3%
		ATOS	2%
UP4 – Fire detection from IoT devices [2]			
Camera based fire detection connected on a Raspberry Pi	CTL	CTL	20,00%

[1] Pending confirmation
[2] Confirmed

Name of component	Lead developer	Contributing parties	IPR %
EMDC – Data Center installed on the Edge for data collection and analysis		DELL	20,00%
Fire detection algorithm that will run on the EMDC		ATOS	20,00%
Fire detection algorithms that will run on the edge on some embedded device		FINCONS	20,00%
Sensory data collection and analysis on a Raspberry Pi		UTH	20,00%
UP5 – Fire inspection using UAVs and UGVs [1]			
		CSIRO	33%
		TRT	33%
		3MON	33%
UP6 – Fire spread forecast [2]			
	EXUS		100%
UP7 – Biodiversity profile mobile application [1]			
	VTG		100%
UP8 – Citizen Engagement App [3]			
	MDS		42%
	UISAV		42%
		HB	4%
		ITTI	1%
		SIMAVI	9%
		HRT	1%

6.4.2 Legal structure

There are no updates with regards of a legal structure to manage the exploitation of the results after the project closure. This will be brought to the consortium to be decided at a later stage during the next period when additional information will be available. Meanwhile, the exploitation agreement path will be explored as a possible alternative.

6.4.3 Exploitation agreement

With regards to the exploitation agreement, as an intermediate option for the commercial collaboration among the consortium partners, there is a draft version that will be shared to partners to collect contributions and consolidate a document in order to have a final version that can be later validated.

[3] To be updated with a fairer distribution for content providers

6.5 Business model

This section provides an overview of the methodology to be followed to develop the SILVANUS business model for the exploitation of the different SILVANUS results. It will start from the business model canvas provided in the Description of Action within the Grant Agreement [5].

The business model will be generated under the Canvas methodology [3]. This is a quite intuitive and visual approach under the shape of nine (9) building blocks, which represent the main nine dimensions of any business model, summarized below, in Figure 103:

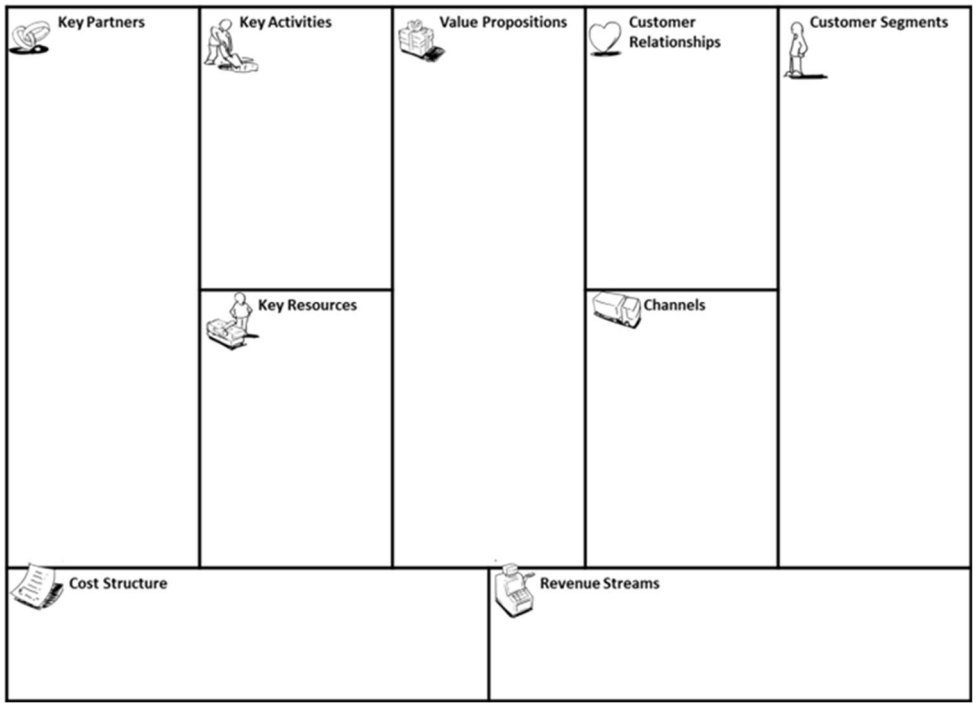


Figure 103 Business model Canvas methodology

Value proposition

Which is the **added value** SILVANUS can provide and a user would be **willing to pay for it**.

Customer Segment

Which are the **different target groups** of people or organisations in order to provide SILVANUS as a product/service? For whom are we creating value? Who are our most important customers?

Vertical approach

- Public Administration
- Private Sector / Industry
- Academia and research organisations

Horizontal approach

- Technology providers
- Services providers
- Direct end users

Distribution channels

How will we **communicate and contact/reach** our Customer Segments to deliver a Value Proposition? Or the way around, how our Customer Segments **want to be reached**?

Example of channel to distribute the platform can be:

- Own (from a web site or marketplace to the company's own sales force)
- Partner (from stores-retail or wholesale-to partner's web sites)

Different options to be considered are among others:

B2b (Business to business)

- **Wholesale**
- **VAS** (Value-added services)
- **Bundle**
- **Open sourcing**
- **IT Consultants/ System Integrators**

B2c (Business to customer)

- **Website**:
- **Application store (market place)**
- **Bundle**
- **Open source**

Customer Relationships

Types of relationships established with the different customer segments. What are our customer segments' expectations related to the type of relationship with us? Are they cheap or expensive?

The main relationship with the customer will be carried out via:

- Personal assistance. There is a direct interaction between the customer and the company (dedicated helpdesk, consultancy projects).

This initial approach can be accommodated to the needs identified during the interaction with future customers.

Revenue streams

How will we **generate incomes** from the different customer segments? Are they all eligible to pay the same? Which is the pricing structure per component or service?

Main revenue stream approach will come from Fee structure (subscription, usage, broker, etc.) or licensing although the option to sell components could be considered if a commercial opportunity pops up.

Key activities

Which are the most important things we have to do to make this business model work. What is required to make our Value Propositions available to our customer segments/distribution channels/customer relationships/revenue streams?

- Dissemination / Awareness
- Presales
- Consulting (Market Analysis, GAP analysis, Customization…)
- Integration / Implementation

- Training
- Maintenance
- Standardization

Key Resources

Which are the most important **resources needed** (in order to support our value propositions, distribution channels, customer relationships, revenue streams, etc.) to make our **business model work**?

- Persons (who are going to deliver the value proposition itself)
- Knowledge (brands, patents, copyrights…)
- Software/Hardware (specific SILVANUS components)
- Economic/Finance (credit lines, grants…)
- DNS server infrastructure (?)

Key Partners

- Public/Semi-public sector
- Private sector
- Academic sector

Cost Structure

The Cost Structure describes all costs incurred to operate business activities. What are the main costs attached to our business model? Which Key Resources/Activities have a higher cost?

This building block represents the economic expenditure to be carried out by the consortium to run a new business operation including a range of expenditure items such as **Capex** (Capital expense, investment regardless of the volume produced) and **Opex** (Operating expense heavily dependent on the volume of output generated).

6.6 Market analysis

6.6.1 Market definition

The wildfire management market is composed with all the tools and systems that can be used to prevent, provide forecasts, detect, and manage declared wildfires. Together with the growth in number, extension, and severity of wildfires over the last decade, it has also grown the market for related tools to support the fight against this threat. The increase of expenditure by agencies dedicated to fight forest fires in technologies such as satellites, drones, Artificial Intelligence, Machine and Deep Learning tools is remarkable [4].

As described on the SILVANUS Grant Agreement Annex 1 Part B [5], the market with SILVANUS solutions covers the areas for:

a) Prevention and preparedness, with tools for the evaluation of risks with computer-based models, training of firefighters using virtual reality and augmented reality (VR/AR), mobile applications to gather citizen insights and to raise awareness about dangers of forest fires.
b) Detection and response, including platform with advanced capabilities for first responders, systems for detection of forest fire, and tools to model the spread of forest fire considering inputs from climate and weather services resulting in a response coordination. Solutions include the use of Earth observation repositories, granular weather and climate predictive models, the use of autonomous systems to get insights on the spread of fire, unmanned aerial and ground vehicles.
c) Restoration and adaptation activities based on simulation models for the evaluation of forest resilience to fires based on earth observation data from space and surface networks.

6.6.2 *Market Size, Growth Rates and Trends*

According to several market forecasts [6] [7], it is expected that the forest wildfire detection systems market alone will grow at a compound annual growth rate (CAGR) above 6% from 2022 to 2030. The market growth factors include the increasing demand for forest wildfire detection systems due to the increase in forest fires and the risks associated to forestry and agricultural sectors to prevent impacts caused by wildfires, which are growing due to changing climatic conditions. Also, there is a rising awareness about the benefits of these fire detection systems, the development of technologies with higher accuracy for fire detection, and the increase in public and private investments for research and development of activities related to fire safety technologies. According to a study by the United Nations (UN), prediction is that global extreme fires will be increased by 14% at the end of this decade, 30% by 2030 and about 50% by the end of the century [4]. The factors related to this increase are the climate change and the land-use change.

Among the growth trends in the wildfire sector are the increase of the use of satellite data, where governments are partnering with different agencies, the inclusion of drones for preparedness, response and rehabilitation, and the introduction of data technologies such as artificial intelligence (AI), machine learning (ML), deep learning (DL), and the use of robotics in the early detection of wildfires [4].

6.6.3 *Supply side*

In terms of offer, within the scope of the SILVANUS products, in Table 7 below, a summary of each solution scope and a brief description of the competition is provided. This is a summary from the exploitation fiches provided under Annex I – Exploitation fiches from the SILVANUS User Products. At this stage, not all competitors' information has been gathered, so in the next period a more detailed analysis will be performed. For the products where competition has been identified most of them seem to be positioned better than external competitors. Nevertheless, market demand has to be further analysed in the next period.

Table 7 Analysis of competition for SILVANUS User Products

UP #	MVP Tool Name	Solution scope	Competition
UP1	AR/VR training toolkit for trainers	The solution allows first responders to experience training exercises but also complex simulations, based on operational scenarios.	Up to 11 competition solutions have been found in a preliminary benchmarking analysis, however, a most detailed analysis needs to be provided in the next period.
UP2	Fire danger tool	The tool provides an indication of the fire danger for an area of interest on a certain forecasting period. This is based on data-driven approaches, exploiting heterogeneous data sources (Earth Observation, Weather/Climate High-Resolution Models, Fire History).	At least there is one similar solution - "European Forest Fire Information System EFFIS" developed by JRC
UP3	Fire detection based on social sensing	Keyword based real-time collection of information from Twitter/X for the extraction of location, visual concepts, and detection of fire events.	3 competition solutions found. 2 of them use other sources than just Twitter/X, like other social networks or web scraping.

UP #	MVP Tool Name	Solution scope	Competition
UP4	Fire detection from IoT devices	Portable IoT kit to be deployed in high risk of wildfire areas for fire detection.	Up to 6 competition solutions available with high accuracy detection, with different degrees of customisation and standardisation.
UP5	Fire inspection using UAVs and UGVs	Firefighters' support electric robot, for deployment in recognition, firefight, or logistic support.	Two competitors for UGVs have been identified, with robots being less powerful or too big and heavy compared with this one.
UP6	Fire spread forecast	Machine learning prediction of future fire spread probability in each area, to prepare and plan adequate firefighting resources.	Two competitors with tools based on older mathematical models with complex data inputs.
UP7	Biodiversity profile mobile application	Citizen engagement through the gathering of biodiversity and location data for fire prevention and ecological awareness.	Five competition solutions identified, with limited focus on biodiversity awareness and forest fire prevention. These solutions don't provide social and AR features.

UP #	MVP Tool Name	Solution scope	Competition
UP8	Citizen engagement programme using mobile app	Citizens and professionals' provision of localised guidelines, notifications and other educational materials to prevent and detect forest fires.	There are apps in the app stores related to forest fires, however they do not bundle multiple functionalities of the CEA. Some examples are: - *FireFringe, Fireguard Wildfire Tracker* and *Fire Alert*: Provide localized information about raging fires using satellite imagery to track fire locations. - *Wildfire Home Safety App:* Uses AR to allow reviewing residential structures for fire mitigation tips. - *Wildfire Ready Virtual:* only explores the preparedness as users navigate their way around virtual homes. - *BC Wildfire Service:* provides real-time wildfire information to the public. However, only for British Columbia and doesn't bundle various guidelines and training modules. - *National Interagency Fire Center:* Provides on-line resources to learn about wildfire prevention in certain states or areas. However, only web-based (no app) and for the USA only. - *Rotary Wildfire Ready:* includes best practice information on how to prepare homes and families for wildfires. (only in Colorado, US) To sum up, most apps only include tracking fires or at best reporting a fire. But there is no application containing quizzes, guidelines etc. about educating citizens on a multinational level. The CEA provides this education as well as tracking and reporting fires.

Some of the MVPs like UP2 and UP6 can be joined in a combo to provide a vertical solution for wildfire prevention. In this specific case, a provision of fire danger risk estimation in a given area (with UP2) can be combined with UP6 to analyse the zones with higher risk to provide the fire spread probability, ensuring adequate firefighting resources on those zones. Also, fire detection based on social sensing (UP3) or on IoT devices (UP4) can be combined with the fire inspection using UAVs and UGVs (UP5).

6.6.4 Demand side

In terms of market segmentation and, eventually, potential customers for SILVANUS products, the following analysis has been performed from the information provided by the SILVANUS User Products. In Table 8 below, an approach is provided inferring customers that may license the solutions to provide services to different end-users.

Table 8 Customer segmentation per SILVANUS User Product

UP #	MVP Tool Name	Customers
UP1	AR/VR training toolkit for trainers	• Firefighters. • Civil protection and other first responders. • Forest & wildfires protection authorities/institutions. • Critical infrastructure operators (for forest and infrastructure protection).
UP2	Fire danger tool	• Forest & wildfires protection authorities/institutions. • Researchers. • Environment and climate change experts. • Civil society organization and other non-profit organizations.
UP3	Fire detection based on social sensing	• Firefighters. • Civil protection and other first responders. • Journalists
UP4	Fire detection from IoT devices	• Firefighters. • Civil protection and other first responders.
UP5	Fire inspection using UAVs and UGVs	• Firefighters.
UP6	Fire spread forecast	• Firefighters. • Civil protection and other first responders.
UP7	Biodiversity profile mobile application	• Forest & wildfires protection authorities/institutions. • Researchers.
UP8	Citizen's engagement programme using mobile app	• Forest & wildfires protection authorities/institutions.

With a bit more detail, the different customers and their main roles are described here below:

- **Firefighters**: Organisations devoted to fight forest wildfires, including plan and prevention,
- **Civil protection and other first responders**: Organizations dedicated to the protection and assistance of civil society in case of emergencies.
- **Forest & wildfires protection authorities/institutions**: Institutions, mostly belonging to public authorities, with the role of management and protection of the natural environment.
- **Critical infrastructure operators (for forest and infrastructure protection)**: Operators of critical infrastructures that are partially deployed in the natural environment and that are obliged to ensure the safety of the infrastructures, as well as to protect the infrastructure itself.
- **Researchers**: From academia or RTOs that can use the assets for their research goals.
- **Environment and climate change experts**: These customers will be usually associated to a public or research entity in charge of environmental protection and/or risk assessment.
- **Civil society organization and other non-profit organizations**: Organizations with the mission of protecting and safeguarding the natural environment.
- **Journalists**: Interested in reporting potential wildfires. However, this should be used with discretion and only publicly reported after confirmation with authorities.

6.6.5 SWOT analysis

With regards to the SILVANUS market SWOT analysis, the original one provided in the Description of Action [5] has been updated considering the exploitation fiches from the eight SILVANUS MVPs. See Figure 104 below.

In the Strengths quadrant, a reference to IoT technologies has been added as it is used in UP4.

The Weaknesses quadrant has been updated with an additional point that refers to UP3 with regards to the use of data feed from Twitter/X social network. Due to the changes in the last year, it seems that there is an instability risk in the access to data or the business conditions to access that data. Nevertheless, this is not exclusive of this specific social network, as most of them define their own privative access APIs to data, and at any moment any social network may change the conditions to access their data feed.

The Opportunities quadrant has been updated with an additional point that refers that the increase in risk of forest wildfires in the last years is probably creating a demand for new tools, even disruptive solutions, so those providing new tools for assessing the risk and even the evolution of a wildfire will probably have increased opportunities in the market.

The Threats quadrant has been updated with a new point that refers that some SILVANUS tools still need to find their market niche, mostly UP7 and UP8, so the target customers still need to be discovered through specific market research. D10.5 – Report on Forest Landscape Management Services - will have a detailed SWOT analysis for every UP and for the entire SILVANUS platform.

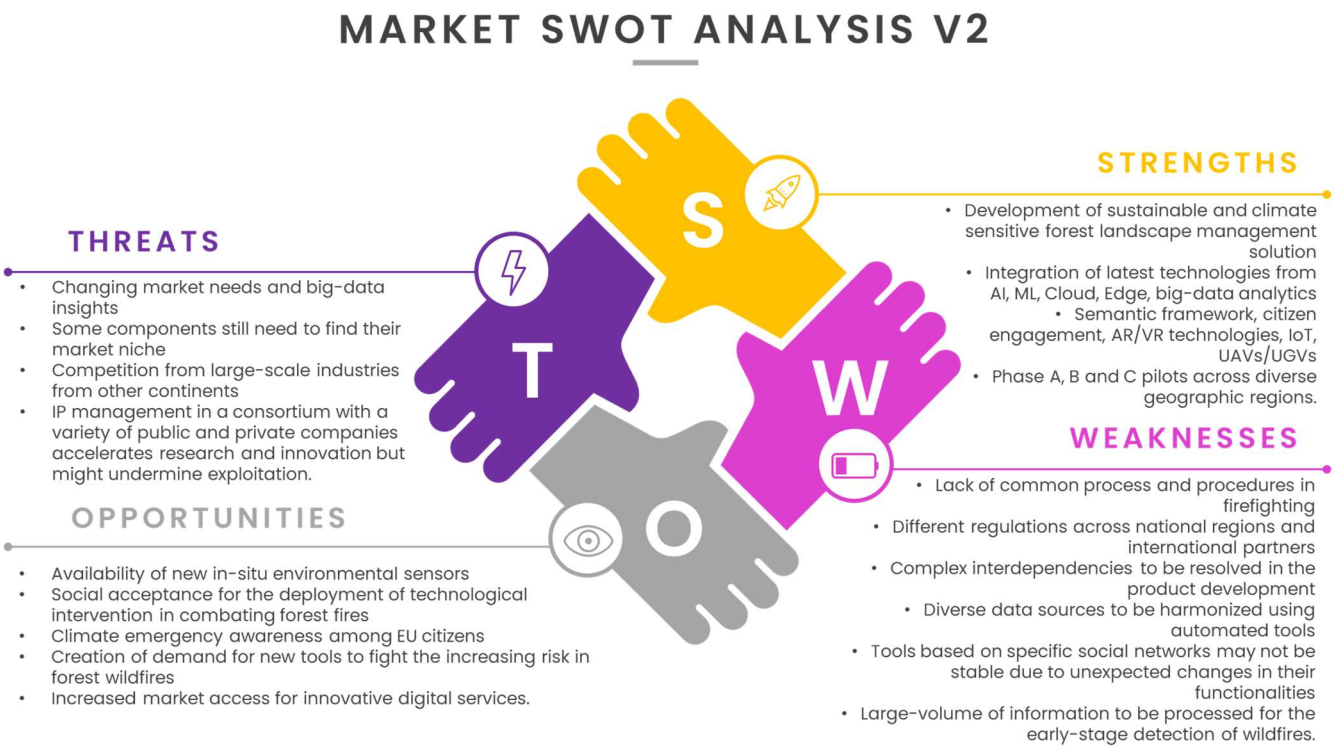


Figure 104 Revised SILVANUS market SWOT analysis

6.7 Next steps

In the next iterations of the annual report, the consortium will pay special attention to the following topics:

- **Updated information on exploitable items**. Providing updated and more complete information on identified exploitable items, namely the MVPs already defined, and the additional individual products promoted by consortium partners.
- **Updated information on Individual exploitation plans**. Providing any updates on the already provided plans or even additional exploitation plans provided by partners who didn't `provide them so far.

- **Joint exploitation**. Validation of IPR agreement by the corresponding partners, including the IPR percentage distribution. Collect pending IPR distributions and start the process for the signature of the agreement. Check the feasibility of providing some legal structure to support a join project exploitation after the project concludes. Complete a draft document and validation of an exploitation agreement as an alternative to a legal structure for a join exploitation.
- **Business model**. Complete the Business model Canvas methodology and revenue streams for the exploitable assets. This will rely on the Market analysis already provided, and upcoming updates, to conform the canvas' building blocks for each MVP.
- **Market analysis**. Complete the market analysis with more details from the exploitable items and further market information to be collected.
- **Letter of Intention**. Draft the LoI to be later distributed among project partners interested to show their commitment to the future exploitation of SILVANUS project results.

7 Standards and Compliance for Interoperability of SILVANUS Platform – Current Status

The operational standards are to be understood as management elements that can be applied during the crisis management using the SILVANUS platform. In the context of international standards, these standards are to be seen as useful tools for finding solutions for managing emergencies related to the reality of forest fires. This is made possible due to the constant execution of pilot exercises within SILVANUS, exchange of documentation with technical partners, direct engagement with end-users with the consortium partners, those directly involved in forest fire scenarios (citizens, civil protection operators, fire brigades, etc.) and rescue teams.

This is part of a broader path concerning Task 10.5, which includes specific steps within the development of the SILVANUS project. Chapter 7 of D10.2 focused on drawing a general picture of standardisation in the three phases of the SILVANUS project, providing an overview of the current operational procedures used in the three phases of a forest fire. The current Deliverable deals with standardisation in the sense of voluntary standards potentially applicable to the various technical phases of SILVANUS, and D10.4 (due in September 2024) will identify through the existing standards on the market (or any new ones present) what are the strengths and weaknesses, as well as the lessons learnt from the demonstrations that took place through the pilot activities and actions that can be taken for the future.

The second part of activities was the identification of technical standards to which SILVANUS platform will comply with to support the data formats. This work, which took shape over the course of the year thanks to constant research work and data sharing with partners, made it possible to achieve the result of obtaining a clear picture of the data formats to be used in order to achieve IT standardisation and ensure the interoperability of the various applications to be developed within SILVANUS.

7.1 Operational Standards

Many old systems usually fail to communicate with new ones and vice versa. At the same time, event response procedures, response plans, training tactics and guidelines, as well as the typical symbols of first aid organisations, are not the same between different organisations and countries. A very simple example is the now universally recognised symbolism or alphabet used for the identification of dispatch codes in the 'start of emergency' communication to rescue teams. A strong standardisation process and commitment to the implementation of an interoperability system, however, brings with it some questions, to which finding an answer becomes a priority: how can one be sure that the correct alphabet is used? How can one be sure that all rescuers (both professionals and volunteers) know the alphabet and the relevant dispatch codes? Is it common to all organisations or in all countries?

This simple example reveals the generic problem of interoperability not only between systems but especially between organisations and procedures.

Achieving a good level of standardisation means creating a rapid response system that can achieve the ultimate goal of saving lives, preserving the environment and protecting property and the economy in the shortest possible time.

While in Y2 of the project duration, a detailed survey of different operational standards was analysed in collaboration with the project organised pilot activities (such as those to be reported in D9.2). At the time of submitting this deliverable, two pilot activities have been conducted (in Croatia and Slovakia). However, as many of the additional pilots (France, Italy, Greece, Czechia, Indonesia, and Australia) are to be carried out in autumn of 2023, the evaluation of the operational standards to be adopted among different

firefighting teams will be carried out following the conclusion of the first round of pilot activities. The results from the operational standards integration, will be reported in D10.4 (September 2024).

7.2 Technical Standards

During the year, after a careful and thorough analysis of the several technical methods to achieve standardisation for the interoperability of the SILVANUS system, the technical development team has been consulted on the data formats which are being supported in SILVANUS, to which the platform will be able to comply with. To this end, the SILVANUS platform, will use the following types of software at the primary level

- Cartographic processing, spatio-temporal data analysis
- Generic data/metadata sharing: Allocation of forest fire resource management using mathematical modelling to support decision making and visualisation in GIS;
- Generic data/metadata sharing: forest fire warning system based on the number of data posted on social media;
- Generic data/metadata sharing: API for classifying or not classifying text data in forest fires
- Generic data/metadata sharing: API to identify the location of forest fires from text data;
- Geographical Data (GIS): Geographical Information System (GIS)
- Navigation and localisation software: Navstack Navigation and localisation software
- Generic data/metadata sharing: Citizen Engagement app
- Spatial/geographical data: Aloha (CAMEO)
- 2D/3D CAD modelling: CAD software for preparing layers (with areas and objects) for the needs of hazard and evacuation computer simulations, Marplot (CAMEO)
- Spatial/geographical data: QGIS
- Array-oriented scientific data: NetCDF, software libraries and machine-independent data formats that support the creation, access and sharing of array-oriented scientific data
- Documentation: generic documents, videos, compressed images, spreadsheets (with formulas)

These software types identified by the consortium partners represent the starting standard with which to define the interoperability guidelines for the system and its interconnections. As the platform is a tool under development, standardisation will be such that it can also be implemented with other types of software that may be identified during the course of the project.

The standardisation path defined in Task 10.5 is such that all consortium members using a certain type of software will be able to standardise, e.g. if it is identified that the dispersion models of gases or vapour phase pollutants present in a smoke pinnacles generated by a forest fire are developed using ALOHA, then all dispersion models will use this software or at most software that generates files interchangeable with ALOHA.

In order to ensure that the various data packages are compatible with the various software and applications, a table has been created in which the optimal data format is shown for each type of software in order to get the best reading of the data and, if applicable, any other accepted format.

Table 9 File Types Supported within SILVANUS Platform

Software applied	Preferred File	Accepted File
Cartographics processing, spatio temporal data analysis	tiff	---
Geographical Data (GIS) Vector	shapefile	geojson
Geographical Data (GIS) Raster	geotiff	---

Generic Data/Metadata sharing	json	csv
Spatial/Geographical Data	kml	gpx
CAD 2D/3D modeling	dwg	---
Array-oriented scientific data	Netcdf	---
Navigation and localisation	bag	---
Documentation	pdf	---
Video	mp4	---
Compressed Images	jpeg	png
Spreadsheets (w/formulas, no raw data)	xlsx	---

An equally important role in ensuring technical interoperability is played by the protocols applied. A protocol is defined as the set of computing resources, equipment, communication networks and IT procedures used for the proper management of data flows. Again, by grouping data sources into two categories, namely general data transfer and communication with IoT devices, accepted (optimal) and supported data protocols have been defined.

Table 10 Interchange Protocols Used by SILVANUS Platform

Protocol applied	Preferred	Accepted
Generic Data Transfer	REST API (over http(s))	http(s)
Communication with IoT devices	Rabbit MQ	MQTT

7.3 Next Steps

The next steps will therefore be:

- Understand from the activities of the pilot sites and training sessions what are the strengths and weaknesses. Analysing possible criticalities with the fundamental contribution of technical and operational partners in order to define standard procedures that can be adopted in the fire prevention, fire response and post-fire intervention phases;
- Update the standardisation and interoperability of IT systems (seeking greater cooperation from partners). Since this is a tool under development, standardisation will be such as to allow its implementation also with other types of files, provided that they are technically usable in an interoperable way, which will be eventually identified during the project.

8 Future Communication and Dissemination Activities and Outputs

8.1 Events

8.1.1 Cloud-Edge Continuum Workshop (CEC 23) in Reykjavik, Iceland

SILVANUS will feature as one of the co-organisers of the Cloud-edge Continuum Workshop (consortium member DELL is one of the principal parties), which will take place in Reykjavik, Iceland on October 9th, 2023. Main aim of the workshop is to bring together researchers and practitioners from academia and industry to discuss the latest research, trends, and challenges in ecosystems and environments based on Cloud-Edge Continuum paradigm. The primary goal of this workshop is to foster collaboration and exchange of ideas among researchers and stakeholders.

8.1.2 The 6th International Conference on Information and Communications Technology 2023 (ICOIACT) in Yogyakarta, Indonesia

SILVANUS will participate with a project presentation at the 6th ICOIACT 2023 in Yogyakarta, Indonesia, on November 10th, 2023, co-organised by consortium member AMIKOM. The goal of the conference is to promote discussion and interaction among academics, researchers and professionals in the field of Technologies and Information Engineering. This conference provides an international forum for the presentation and showcase of recent advances on various aspects of ubiquitous technology. ICOIACT will take place the same week as the SILVANUS pilot exercise in Indonesia in November 2023, which will focus on biodiversity restoration and adaptation after a wildfire incident. As one of the more important events on the non-EU / international sphere, it will provide a great opportunity for SILVANUS to disseminate the project results.

8.1.3 2nd Wildfire Project Management Clustering Event in Brussels, Belgium

The 2nd WFRM Clustering Event will take place in Brussels, Belgium, on November 22nd, 2023, and it will focus on Integrated Wildfire Management. Questions of synergies of WFRM project results will be debated, along with an agreement on a potential common terminology use and glossary. Assessment of the work on joint impact assessment and on the governance framework will also be one of the most important topics of the event. This will be an important milestone in the EUFIreProjectsUnited initiative and will bring together WFRM projects closer to achieving optimal project synergies.

8.2 Dissemination Material (Newsletter, Video)

SILVANUS will continue with the regular issuing of newsletters (September and December 2023), with an update of pilot exercises which will take place in the final quarter of 2023. A video will be made on all of the implemented pilot exercises, once the 1st trial period comes to an end. Public deliverables written in this period will be available on the SILVANUS website. Social media posts will continue to showcase engaging material on SILVANUS project outputs, as the project reaches the ending of the 1st trial period of pilots and approaches the phase of full-scale platform testing.

9 Conclusion

SILVANUS has continued its communication, dissemination and stakeholder engagement strategy in the second year of the project with a robust international campaign, which was highly active both through live events and in the virtual sphere. While the first year was focused more on the awareness-raising aspect of the project, introducing its mission and objectives to an audience of stakeholder target groups and citizens, the second year emphasised knowledge-sharing. This means that the presentations and dissemination material were focused on describing the newest developments of SILVANUS platform and the user products. More than 9,300 people attended SILVANUS events in its second year. The testing of user products through the execution of pilot exercises in Croatia and Slovakia was emphasised to stakeholders as an important milestone in the development of the SILVANUS platform.

The established communication and dissemination tools, such as website, social media, and promotional material, were upgraded in line with the advancement of project results. Along with the thorough, visually engaging, and accessible description of user products and summaries of pilot exercises, dissemination activities focused on the interactivity of the SILVANUS platform. These interactive components, such as the citizen engagement app or the Woode biodiversity indexing app, were highlighted for the purpose of letting stakeholders know that their input will be essential for the overall success of the platform.

The number of website visitors, newsletter subscribers, video viewers, and social media followers has notably increased. Stakeholder engagement activities, both through close contacts with external stakeholders, the External Advisory Board, and event networking, have brought forward candidates for the formation of Sustainable and Forest Resilient Working Groups, which will provide vital feedback to platform development. The relationship with EAB members has brought forward essential frontline perspective to improve the platform.

Regular communication has continued with the CSA, IA and other WFRM projects. Fruitful collaboration on joint workshops and social media campaigns has achieved important outcomes, particularly through the increase of stakeholders and interested parties in the project. Individual results of WFRM projects may help to advance the effectiveness of the SILVANUS platform. This will be a salient topic in the months to come, in order to make sure that the wildfire management projects are working together in achieving the Green Deal targets. Cooperation with the Green Deal Projects Support Office, through the organisation of success story webinars and videos, has likewise brought an increase in SILVANUS exposure to a number of experts in the area of climate change and biodiversity, extending the stakeholder pool far beyond the area of wildfire management. Citizen engagement programmes and educational campaigns, such as exhibitions in Croatia or television presentations in Slovakia, have brought the project closer to citizens, especially local communities affected by wildfire. Tens of thousands of viewers and citizens were exposed to SILVANUS through television and online coverage.

The interoperability of SILVANUS platform will be verified through a detailed analysis and adoption of international standards. This analysis is ongoing and will provide a framework for the exploitation of SILVANUS outputs after the project comes to an end. A detailed exploitation business plan is developing after the collection of the partners' joint exploitation plans and user product exploitation fiches. The basis for the business plan is the creation of a comprehensive business model, supported by market analysis, to secure a viable position for exploitable components of the SILVANUS platform.

The knowledge-sharing of SILVANUS will be established beyond the project with the Centre for Adaptation Strategies and Development (CASD). The development of CASD has achieved the milestone of establishing a management board. A Task Force has been established to work on a white paper to outline the objectives and ambitions of CASD. The final stages of SILVANUS will focus on delivering a viable and self-sustainable business plan to secure a Centre that will be a crucial consulting entity in the area of wildfire management beyond the duration of the project, sharing expertise and emphasising project results.

The next phase of communication, dissemination and stakeholder engagement activities will focus on finalising the trial period of pilot implementation, on the full-scale testing of the platform, and on the common mission to make the technical results of SILVANUS as clear and accessible to stakeholders and

citizens. SILVANUS platform will be successful only if the interaction with the project's stakeholders and citizens is based on trust and effective knowledge-sharing. The project is taking this into account while approach its third year of activities, which will be thoroughly described in Deliverable 10.4.

10 References

[1] Marić, L. et. Al. (MD) (2022): D10.2 SILVANUS - Annual Report on SILVANUS Dissemination Activities v1.

[2] Anastasopoulos, D. et. al. (2022): D8.1 Report on SILVANUS reference architecture.

[3] Osterwalder, A., Pigneur, Y., Smith, A. (2010): Business Model Generation.

[4] Institute for Defense and Government Advancement (2023): Wildfire Technology Management Market Report Australia, Canada, & US. https://www.idga.org/land/articles/wildfire-technology-management-market-report-australia-canada-us. Access: August 2023.

[5] SILVANUS Grant Agreement. 2021.

[6] DataIntelo (2022): Forest Wildfire Detection System Market Research Report.. https://dataintelo.com/report/forest-wildfire-detection-system-market-report/. Access: August 2023.

[7] Infinity Business Insights (2023): Global Forest Wildfire Detection System Market 2023 by Company, Regions, Type and Application, Forecast to 2030, 2023. https://www.infinitybusinessinsights.com/reports/global-forest-wildfire-detection-system-market-2023-by-company-regions-type-and-application-forecast-to-2030-1595185?mode=Infiani. Access: August 2023.

[8] EU Regulation 1025/2012 https://eur-lex.europa.eu/legal-[content/EN/TXT/?uri=CELEX%3A32012R1025

[9] ISO/IEC Guide 59:2019, https://www.iso.org/standard/71917.html

[10] ISO Standard www.iso.org

[11] [12] Lundqvist, B., Standardization under EU competition rules and US antitrust laws: the rise and limits of self-regulation.

[13] Park, H., Patents and Industry Standards, and Blind, K., The Economics of Standards: Theory, Evidence, Policy.

[14] These are forms of collaboration promoted at European level by the Council Resolution on the role of standardisation in Europe, 28 October 1999.

[15] Guidelines for implementation of Agreement on technical co-operation between ISO e CEN.

[16] IEC-CENELEC Agreement on Common planning of new work and parallel voting.

[17] Farrell, J., Hayes, J. Shapiro, C., Sullivan, T. Standard Setting, Patents, and Hold-up, in Antitrust L. J., 2007, vol. 74, 624. Si veda anche D. SEO, Analysis of Various Structures of Standards Setting Organizations (SSOs) that Impact Tension among Members

[18] Colangelo, G., Aspettando Huawei Technologies: standards, essential patents and commitments.

[19] Maskus K. and Merrill S.A., Patent Challenges for Standard-Setting in the Global Economy: Lessons from Information and Communication Technology.

[20] https://aful.org/gdt/interop

11 ANNEXES

11.1 Annex I – Exploitation fiches

11.1.1 UP1 - AR/VR training toolkit for trainers

Component name	AR/VR solution
Functionality	The training programs developed within the AR/VR solution will be delivered to the first responders (fire fighters).
Key features	AR/VR solution allows first responders to experience training exercises but also complex simulations, based on the operational scenarios.
Expected TRL	TRL 7
Licence	• Licensing
Owner	SIMAVI
Component manager	Bogdan Gornea bogdan.gornea@siveco.ro

Commercial Assessment of the extension

Value proposition

Problem statement	• Need of training the first responders in a modern environment (AR/VR) and use innovative tools for creating and managing complex operational scenarios for firefighting and learn about safety procedures in critical / emergency situations. • Need for rapid, secure and reliable data exchange, providing the first responders to easily access services to speed up decision-making due to efficient data analysis and processing.
Benefits	• AR/VR solution allows first responders to experience both training exercises and complex simulations, based on the operational scenarios. • AR/VR solution is cost effective and can be used simultaneous by multiple users. • AR/VR solution provides the first responders in real-time relevant information about the event (wildfire), status and environment, to speed up decision-making in case of major incidents and critical situations. • AR/VR solution is based on innovative technologies and open architecture capable to integrate various types of realistic data. • AR/VR solution has a dedicated intuitive User Interface for end-users.
Unfair advantage	AR/VR solution acts both as a player and as an authoring tool, enabling the users to experience training programs and create also training scenarios based on their specific needs. The solution allows the implementation of training programs in a virtual environment (VR/simulations), based on scenarios specific to operational modes.

Target users

Target user 1	• Firefighters' organizations, emergency organizations / departments (local, regional, national)

Target user 2	• Critical infrastructure (utilities), organizations for the protection of forests and the environment
Target user 3	• Academia

Competition

A preliminary benchmarking analysis was performed in order to identify similar AR/VR products / solutions existing on the market and compare their features with the ones of SILVANUS in order to determine its distinctive and innovative particularities and capabilities. As mentioned before, this analysis will be extended in the next period, in accordance with the specificity of the market sector to which we are addressing in the project.

#	Name of competitor solution	Company	Strenghts	Weaknesses	Solution unfair advantage
1	Glue (https://www.glue.work)	Glue Collaboration	…		
2	Scotty (https://www.scotty.expert/en/)				
3	ENGAGE (https://www.engagevr.io/)	ENGAGE			
4	InnoChain ETN (http://www.innochain.net)	InnoChain			
5	YORD STUDIO (https://www.yordstudio.com)	YORD			
6	Crystal Apps (https://www.crystalapps.eu)	Crystal Apps			
7	4Experience (https://4experience.co/)	4Experience			
8	WE / AR Studio (https://www.wear-studio.com)	WE/AR Studio			
9	Delta Reality (https://www.deltareality.com)	Delta Reality			
10	Zappar (https://www.zapar.com)	Zappar			
11	Khora Virtual Reality (https://www.khora.com)	Khora			

Distribution model

Distribution model	• Direct sale
Customer contact	• Project website, organization website, networking / clustering
Promotion means	• Events, workshops

Delivery model

Delivery model	On-premise

Customer relationships

Customer relationship	- Technical support / assistance - Training, consultancy - Customizations

Financial Model

Cost structure	CAPEX: - Equipment, upgrade to equipment, software upgrade, software licenses OPEX: - Development costs for improving / customize the solution. - Maintenance costs - Marketing and sales costs - Other costs (administrative costs, travel costs) Costs estimation per year: - Sofware licenses (Unity, VR glasses, Adobe Suite) aprox. 16.500 EUR - Development services: aprox. 12 PM (5000 EUR / PM) – 60.000 EUR - Marketing, sales and PR: aprox. 6 PM (5000 EUR / PM) – 30.000 EUR - Other services: 1 PM (5000 EUR / PM) – 5000 EUR
Revenue structure	- Revenues from licensing (TBD) - Revenues from selling services

11.1.2 UP2 - Fire danger tool

Component name	Fire Danger Tool
Functionality	The Fire Danger Tool provides estimation of the fire danger based on data-driven approaches that will exploit heterogeneous data sources (Earth Observation, Weather/Climate High-Resolution Models, Fire History). The tool provides an indication of the fire danger for an area of interest on a certain forecasting period (for the next hours, days, months/seasons). The main aim is to provide information about the conditions that reflect the potential, over an area, for a fire to ignite and spread but it can be used also as input for improving early detection of wildfires (e.g., increasing the monitor frequency by the sensors, planning drone missions to monitor areas with high fire risk). It is completely automated, and it provides an API that facilitate the integration with downstream applications (e.g., visualization tools, GIS, …)
Key features	The tool has several features including: 1. It provides fire danger information across different temporal horizons (from hours to summer seasons). 2. It provides fire danger information at high-resolution integrating high-resolution weather and satellite information. 3. It provides information about the predictor features for further analysis by the end-users (e.g., weather information, vegetation indices, …). 4. It will be made available as an API to easily access information and to integrate in downstream custom services/applications.
Expected TRL	TRL 8
Licence	Not decided yet. *Note: Regarding the component we have still to decide if it will be released as open source or kept as closed source. The service will be available through a public/open API.*
Owner	CMCC F
Component manager	Marco Mancini – marco.mancini@cmcc.it

Commercial Assessment of the extension

Value proposition

Problem statement	The existing fire danger tools are not available at high-resolution, information is not easy to access (usually it is provided through images), and they do not consider some data sources that can contribute to the fire danger lowering the accuracy of fire danger predictions.

Benefits	Due to the non-profit nature of CMCC F, the benefits of the tool that will be produced will have academic characteristics where different researchers will be able to access the data and further exploit it. It will contribute to producing knowledge and know-hows. Additionally, the data that the tool will provide will also be used to write scientific publication and attend scientific conferences and events. It is also worth mentioning that CMCC F is aware of the commercial exploitation of some of the outputs of SILVANUS and the organisation is committed to further increase the commercial attractiveness of the project's results and ready to collaborate further with other members of the consortium to make that a reality.
Unfair advantage	N/A

Target users

Target user	• Researchers • Forest protection authorities. • Environment and climate change experts. • Wildfires protection institutions. • Civil society organization and other non-profit organizations.

Competition

#	Name of competitor solution	Company	Strenghts	Weaknesses	Solution unfair advantage
1	Forest Fire Information System EFFIS	JRC	Provided as component of the Copernicus Emergency Management Service. Weather Information from ECMWF. Supported by a network of Experts from Europe.	Information are provided trough a web interface (difficult to integrate in downstream applications), weather resolution at 8km, daily resolution, fire danger is based only on weather information (e.g., Fire Weather Index)	Component of the Copernicus Emergency Management Service.

Distribution model

Distribution model	N/A
Customer contact	N/A
Promotion means	N/A

Delivery model

Delivery model	N/A

Customer relationships

Customer relationship	N/A

Financial Model

Cost structure	N/A
Revenue structure	N/A

11.1.3 UP3 - Fire detection based on social sensing

Component name	Fire detection based on social sensing
Functionality	The main functionalities of this component include: (i) the real-time collection of tweets based on user-defined search criteria, e.g., keywords, (ii) the extraction of locations in order to geotag the posts, (iii) the extraction of visual concepts from Twitter images, (iv) the detection of fire events according to tweets, and (v) visualization of posts and events on a map-based Web application.
Key features	The key feature of this component is that it offers a full stack solution for detecting fire incidents with social sensing, from retrieving real-time social media data to analysing and visualizing them. Another feature that distinguishes this component from other competitive solutions is the incorporation of a social media analysis toolkit that extracts further knowledge from the posts' textual and visual content and does not stay limited to the original information that Twitter provides. Finally, it is dedicated to fire events, while most market products concern the monitoring of a brand.
Expected TRL	TRL 7
License	Open source – Apache Software License 2.0
Owner	Multimedia Knowledge and Social Media Analytics Laboratory (MKLab), Information Technologies Institute (ITI), Center for Research & Technology, Hellas (CERTH)
Component manager	Stefanos Vrochidis <stefanos@iti.gr>

Commercial Assessment of the extension

Value proposition

Problem statement	Wildfires, especially now with climate change, cause immense damages in human properties and result in many casualties. Thus, the detection of wildfires in an early stage is becoming a necessity and any source of information can be valuable. The component exploits crowdsourced data from social media platforms, in particular Twitter, and offers an early-stage fire-

	event detection module that collects, analyses and clusters tweets about fire incidents.
Benefits	• Alternative source of information • Automatic way to monitor social media. • Highly focused on the topic of fires • Rich knowledge extraction (e.g., textual and visual concepts) • Timely notification of fires that are reported on social media. • Improved situational awareness with the spatiotemporal distribution of active fires as reported on social media. • Identification of most affected areas based on online activity
Unfair advantage	• Dedicated to fire-related posts. • AI is involved to extract further knowledge from the original social media data. • Does not rely on the limited geoinformation provided by Twitter, but involves automatic geotagging

Target users

Target user 1	**Firefighters, fire agencies** The component can significantly assist in the early-stage detection of fires (in case an incident or an indication for reckless burning or arson is reported first on social media) as well as in the improvement of situational awareness (spatiotemporal distribution of active fires as reported on social media).
Target user 2	**Local municipalities, prefectures, regions, local/regional civil protection authorities** The component can timely inform about most affected areas and citizens in danger, raising the situational awareness and contributing in better emergency response.
Target user 3	**Journalists** The component can serve as an additional source of information when reporting fire-related news. Journalists already search for social media data, but manually; thus they would benefit from an automated way.
Comment	Most parts of the component are language-independent (except textual analysis, which can still be trained to a new language though), so it is able to support the above users anywhere around the world.

Competition

#	Name of competitor solution	Company	Strengths	Weaknesses	Solution unfair advantage
1	Mediatoolkit https://www.mediatoolkit.com/	Mediatoolkit (Zagreb)	Large selection of crowdsourced information (Twitter, Facebook, YouTube, websites, blogs, forums) Data analysis dashboard	Focused on brand mentions tracking	Spatial distribution of collected and analysed information that can assist more in situational awareness

			displaying summary reports Ability to create custom alerts		
2	PromptCloud https://www.promptcloud.com/	PromptCloud (USA/India)	Highly customized Web scraping services	Geoinformation provided solely by social media APIs (very limited) No spatial visualization of posts	Automatic extraction of locations mentioned inside the post text and geotagging. Fire events (based on social sensing) visualized on a map
3	Tweetmap https://www.heavy.ai/demos/tweetmap	HEAVY.AI (USA)	Rich analytics and map-based view	Too generic; requires manual search in order to view fire-related tweets	High-level knowledge extracted with textual and visual analysis of social media content Dedicated on tracking fire incidents

Distribution model

Distribution model	Direct sales The component will not be sold through intermediary channels but will become available directly from CERTH.
Customer contact	Target users will be reached with dedicated emails and through the institute's communication channels, such as websites, social media accounts, newsletters, etc.
Promotion means	Apart from the aforementioned communication channels, the component will also be advertised in conferences, tech events and trade shows. Promotional coupons and discounts could also be offered to existing contacts, e.g. partners (especially end users) from ongoing or completed research projects.

Delivery model

Delivery model	There is high flexibility on how the solution can be served to the customer, always considering their needs and preferences. It can be hosted on our premises, or it can be set up on the customer's premises, or it can be hosted on a cloud infrastructure.

Customer relationships

Customer relationship	Since the solution is highly customizable, the customer will be significantly involved in its development, taking into strong consideration their requirements. Furthermore, training sessions will be offered after the component is launched. Customer service and maintenance will be offered initially for free (duration to be agreed from both sides) and later on additional charge.

Financial Model

Cost structure	Capex/Opex structure: N/A (CERTH is a public non-profit organization) Cost estimation: 25-50K € for production (depending on customer's selection of features) and 10K €/year for maintenance
Revenue structure	Pricing model: value-based Indicative market price: 30-120K € (depending on customer's selection of features) Revenue estimation: 15K €/year

11.1.4 UP4 - Fire detection from IoT devices

Component name	**UP4 – Fire detection from IoT devices**
Functionality	UP4 is responsible to detect fires on remote areas and provide the appropriate warning to firefighters, public authorities and relevant stakeholders. UP4 will include the development of a portable kit, easily adjustable and setup on forest areas, where there is a strong indication that fire might be ignited and need daily monitoring. The kit will include a gateway (Raspberry PI), RGB camera, weather sensors and SIM adaptor. The kit will be used to monitor the area 24/7 and raise alarm whenever a fire event is spotted. Outcome will be pushed on the cloud and SILVANUS platform for further analysis. The kit is also expected to be connected with external devices and sensors that are placed in pilot cases in Portugal and Italy, as well as to collaborate with the Forward Command Centers (FCCs) that will have the capability to run further analysis on the edge.
Key features	The **main functionality** of UP4 that will be included in the MVP will be the detection of the fire ignition in designated forest areas. More specifically, UP4 will act as a frontline component that will monitor and analyse visual and weather data in order to abruptly detect the presence of smoke and fire in remote areas and SILVANUS pilots. Other key features that will be included in the MVP, entails the development of a component for the secure transmission of data through the available Cellular network. UP4 will also develop a component that will be responsible for the subscription of this product in SILVANUS topics so as to be able to receive and broadcast messages to the other components of the system. Dockerization of the components will be performed on the edge, as well as the storage and removal of meaningful and useless data. System update will also run on UP4 so that the end-users and technicians will be able to update the deployed edge models remotely.
Expected TRL	The Technology Readiness Level (TRL) of UP4 is expected to start from 3 (Experimental proof of concept in M12) and reach up to 7 (System model or prototype demonstration in operational environment) by the end of the project
Licence	• **Licensing:** The Catalink company will license its software directly to other companies.
Owner	Catalink Limited (CTL)
Component manager	Konstantinos Avgerinakis; koafgeri@catalink.eu

Commercial Assessment of the extension

Value proposition

Problem statement	Describe the problem statement that your solution is addressing and
Benefits	**Benefits** for the target users of adopting UP4 solution. - Abrupt fire detection alarm - Highly accurate events - Low false alarm detections - Adjustable and seamlessly installed in any remote use case. **Added value** for the target users:

	- Good documentation provides all the necessary information to setup the system wherever the user wants. - No need to check the system all the time as UP4 has a low false alarm rate combined with high accuracy (True Positives)
Competitive advantage	UP4 is seamlessly adjusted and installed anywhere within an hour and can start sending alarms just after the initiation of the module

Target users

Target user 1	At the first stage of commercialization UP4 will be targeted to Cypriot and Greek first responders, such as firefighters, civil defence, police departments and ambulances that would like to be alarmed when a fire event has been ignited nearby.
Target user 2	At the first stage of commercialization UP4 will be targeted to Cypriot and Greek public authorities, policy makers and other governmental institutes that would like to be notified about fire ignition events and start notifying the citizens about it.
Target user 3	ICT companies that develop AI and machine learning tools and would like to take leverage of an individual UP4 component. Potential B2B collaborations are more than welcome, especially when activities are complementary (e.g., install a fire detection algorithm inside a UAV/UGV)

Competition

#	Name of competitor solution	Company	Strenghts	Weaknesses	Solution competitive advantage
1	AVIOTEC 7.81	AVIOTEC + Bosch	Detect outdoors fire events in highly variable weather conditions	Too complicated; Not easy to be installed	High accuracy detection, even in difficult weather conditions
2	Early Fire Detection	FLIR	FLIR thermal imaging cameras and software can pinpoint hot spots and then initiate an automated fire-fighting response	Highly customable; expensive; not easy to be installed by the end-user	High accuracy both indoors and outdoors, can be connected to other fire-fighting systems
3	OPGAL fire detection	OPGAL	Thermal cameras with embedded fire protection capabilities can detect a fire from a few feet away and up to 4 miles/6 km away.	Highly customable; expensive; not easy to be installed by the end-user	High accuracy both indoors and outdoors
4	-	Novo technologies	Detect fire event in recycling industries	Not standardized; Highly customable and	High accuracy fire detection in a controlled environment

				costly to be implemented	
5	-	Piperaris	Abrupt detection of fire events in controllable environment	Not standardized; Expensive; tested only on constrained environment	Highly accurate and abrupt fire detection
6	-	AA alarm	Highly accurate detection of fire event	Highly customable; Not standardized	Highly accurate and abrupt fire detection

Distribution model

Distribution model	CTL plans to merchandize UP4 through direct sales by meeting its target stakeholders face to face, get their requirements in-situ and preparing the product appropriately. Inside (phone, email) and online (internet) sales are also going to be taken into consideration in the future in order to reach further customers or businesses to collaborate with.
Customer contact	The channels to reach UP4 target users is initially by approaching acquaintances in the domain and organize face to face meetings. Then email template will be sent to identified stakeholders with appropriate communication material. Project website will be continuously updated with appropriate material to raise awareness and alure the attention of potential customers. Social media channels will also be utilized so as to showcase the UP4 competitive advantages and application in different use case scenarios.
Promotion means	CTL will raise awareness through its website, social media and email campaigns. CTL could also use Google search to promote the UP4 online.

Delivery model

Delivery model	UP4 will be designed and tested in CTL premises and will afterwards be dispatched to the end-user so that they can install it on the desired site. There will be also provided a maintenance and installing option in case the customer wants to have our engineers to set up the kit on their premises.

Customer relationships

Customer relationship	CTL plans to create trustworthy relationships with its customers by providing its services from the start to the end of the product selling. UP4 is a product that could be easily installed by the end-user if he follows the well-designed documentation but there will be also given the possibility to hire our highly skilled engineers to install the UP4 on their premises. Maintenance and continuous will be constantly provided to the customers from the beginning to the end of our collaboration. CTL also plans to create a community on the future, where target stakeholders could come together and provide their feedback about UP4 and its usage. That way CTL will be able to continuously improve UP4 and make it even better.

Financial Model

Cost structure	UP4 entails a low-cost structure as it only consists of personnel (salaries) and indirect (administrative) expenses. Capex structure is almost zero as the company doesn't need to upgrade its equipment or infrastructure to develop UP4. Furthermore, the company already operates from a building where all functions may be fulfilled satisfactory. Opex structure is quite higher, as UP4 will require highly skilled personnel to design and install the product wherever needed, leading to higher salaries. Furthermore, administrative costs are expected to raise as CTL will need to setup a front office that will address the issues that might be incurred on the customer size. Travel costs will also raise as our engineers might need to travel to the end-users' premises to setup the UP4. Utilities, insurance and taxes are also expected to raise accordingly to the raise of demand.
Revenue structure	Revenues will be generated by the sales of UP4 product batches in different plans according to the end user needs. An initial pricing strategy is going to be implemented through the envisaged maintenance licenses, namely: i) Ad hoc – Install up to 5 kits in designated area for 5000 Euros and provide no maintenance and updates; ii) Basic – Install up to 10 kits in designated area for 7000 Euros and keep monthly maintenance and updates for 500 Euros; iii) Advanced – Install up to 30 Kits in designated area for 10000 Euros and keep monthly maintenance and updates for 3000 Euros; iv) Custom – Setup a meeting with CTL team to prepare an offer for more kits and respective software updates and maintenance. UP4 offerings are considered reasonable, while a trial period of 1 month will be provided across all licenses. It is expected that the revenue will exceed the cost by securing the first 5 customers and afterwards will provide significant profits, exceeding significantly the break-even point.

11.1.5 UP5 - Fire inspection using UAVs and UGVs

Component name	Colossus Robot
Functionality	Support electric robot for firefighters to be deployed for reconnaissance, firefighting, or logistic support.
Key features	The size/weight is in right balance with the robot power. Electric drive makes it suitable for indoor and outdoor deployment. The robot is universal support tool with lots of various additional equipment.
Expected TRL	The robot is TRL 9, it is successfully used by several fire departments in the world.
Licence	• **Patent**
Owner	Shark Robotics
Component manager	Richard Rehák rehak@3mon.sk

Commercial Assessment of the extension

Value proposition

Problem statement	The robot was never deployed to forest fire. Experiences from the deployment to a forest fire are expecting to be beneficial.
Benefits	Indicate: • Preserving the energy of firefighters • Protecting health and lives of firefighters • Quicker reconnaissance • Quicker suppression of the fire • Better logistic capabilities of firefighters • Deployment to indoor and outdoor space • Water and dust protection • Long endurance with maximum payload • Very large various possible equipment for different missions
Unfair advantage	Nothing unfair

Target users

Target user 1	Fire departments (civil, military, industrial…)

Competition

#	Name of competitor solution	Company	Strenghts	Weaknesses	Solution unfair advantage
1	RTE Robot	Rosenbauer	Small	Not so powerful	
2	Wolf R1	Magirus	Powerful	Too big, too heavy	

Distribution model

Distribution model	• Direct sale or by a partner company • Prefer face-to-face meetings with live robot demonstration capabilities
Customer contact	Contacts are at the webpage: www.3mon.sk
Promotion means	Mainly by good references of the robot from fire departments that are using the robot. Also, by attending exhibitions and projects.

Delivery model

Delivery model	on-premise, hosted

Customer relationships

Customer relationship	Depend on the agreement, mostly self-serviced to some level, then personal assistance.

Financial Model

Cost structure	• Not for public
Revenue structure	• Not for public

11.1.6 UP6 - Fire spread forecast

Component name	UP6 – Fire Spread Model
Functionality	The fire spread forecast predicts the probability of the fire spreading to given area at a given time in the future. The forecast helps the fire commanders visualise how the fire might spread and assist in deploying firefighting resources to combat the fire and plan civilian evacuations routes. For example, planning possible evacuation routes is dependent on which routes are likely to remain open in the near future, or whether there is a probability that the fire will have spread to those routes. The fire spread forecast may also be used for firefighter training and preparedness. The fire spread model is part of the MVP
Key features	The component will use Machine Learning (ML) to predict the fire spread, as opposed to following an equation/physics-based approach. The solution will be dockerized and able to easily communicate with other components of the SILVANUS platform, enabling automated deployment and straightforward operation.
Expected TRL	The component is expected to reach TRL6-7 by the end of the project
Licence	• **Licensing:** EXUS will license its software directly to other companies.
Owner	EXUS Software Monoprosopi Etairia Periorismenis Evthinis
Component manager	Aris Bonanos, a.bonanos@exus.co.uk; Giorgos Diles, g.diles@exus.co.uk

Commercial Assessment of the extension

Value proposition

Problem statement	UP6 can provide an estimation of where the fire will spread over the next few hours. This information can yield invaluable insight to firefighters, so they can plan where to focus their firefighting efforts, organize citizen evacuation through safe routes and can also be used in simulated scenarios for firefighter training.

Benefits	• This future location of the fire front can yield invaluable insight to firefighters, so they can
	  ○ plan where to focus their firefighting efforts,
	  ○ organize citizen evacuation through safe routes, and
	  ○ use tool in simulated scenarios for firefighter training.
	• Fully automated system as part of the MVP, can get most necessary inputs from the Silvanus platform. User only needs to input the current fire front.
	• Fully documented solution that is straightforward to deploy.

Unfair advantage	• Possibility for marketing together with SILVANUS platform giving a holistic view of the situation on the ground during fires

Target users

Target user 1	Firefighters • Operational information to support decision on how to best address a dynamically evolving situation.

Target user 2	• Tool to be deployed in Italy, Slovakia, Portugal (Greece) pilots First responders, emergency services, police

Competition

#	Name of competitor solution	Company	Strenghts	Weaknesses	Solution unfair advantage
1	FlamMap	U.S. Department of Agriculture	Based on mathematical model of fire behaviour; multiple fuel models	Complicated to fully define input data needed	Combination with UP2 and high spatial resolution
2	BehavePlus	U.S. Forest Service	Based on mathematical model of fire behaviour;	Old programming language/ structure, needs redesign	Modern language, novel AI algorithms used

Distribution model

Distribution model	As part of Silvanus solution, as fire spread model depends on other user products for input.
Customer contact	EXUS commercial contact channels
Promotion means	EXUS presales workforce

Delivery model

Delivery model	Initial plan SaaS, but can customize according to client needs.

Customer relationships

Customer relationship	--

Financial Model

Cost structure	• --
Revenue structure	• --

11.1.7 UP7 - Biodiversity profile mobile application

Component name	FIPAS - fire prevention and awareness support Mobile application
Functionality	The application supports citizen engagement through the gathering of biodiversity and location data for fire prevention and ecological awareness.
Key features	To the best of our knowledge and our current market research, there is no mobile application on the market to support the fire prevention based on biodiversity data from forests, supporting the vast collection of biodiversity data by its users.
Expected TRL	TRL 7
Licence	- Android SDK licence - BSD 2-Clause License (Mapbox) - Apache License, Version 2.0
Owner	Venaka Treleaf Limited
Component manager	Tomas Piatrik (t.piatrik@venaka.eu)

Commercial Assessment of the extension

Value proposition

Problem statement	Lack of large-scale data for biodiversity of forests which plays an important role in prevention of fires.
Benefits	Awareness regarding forests protection and active approach to help in preventing fires.
Unfair advantage	The protection of forests is at the heart of the application. This has not been found in other applications in the market.

Target users

Target user 1	- Civilians
Target user 2	- Researchers and analysts
Target user 3	- Firefighters

Competition

#	Name of competitor solution	Company	Strenghts	Weaknesses	Solution unfair advantage
1	LeafSnap	Appixi	Real-time recognition of leaves, forest scope, biodiversity data	Missing following aspects: • forest protection focus, • mapping feature,	Large training database

				• social element, • AI and AR features	
2	iNaturalist	iNaturalist	Real-time recognition of leaves	Missing following aspects: • forest/tree scope, • forest protection focus, • mapping features, • social element, • AI and AR features	Limited but large training database
3	Google Lens	Google	Real-time recognition of leaves, forest scope, biodiversity data	Missing following aspects: • forest protection focus, • mapping feature, • social element, • AI and AR features	Robust training database
4	TreeID	Woodland Trust	Real-time recognition of leaves, forest scope, mapping feature, biodiversity data	Missing following aspects: • forest protection focus, • social element, • AI and AR features	Large tree database
5	Forest Diversity	Česká zemědělská univerzita v Praze	Focus on forest diversity, mapping feature, forest protection focus	Missing following aspects: • tree recognition, • social element, • AI and AR features	Forest diversity data

Distribution model

Distribution model	• Direct sale through VTG's partnerships and contacts • Indirect channels such as App store, website, social platforms.
Customer contact	Project website, company's website, social platforms
Promotion means	Social platforms, SEO, workshops and conferences

Delivery model

Delivery model	AAS

Customer relationships

Customer relationship	Automated services, personal assistance, community

Financial Model

Cost structure	Administrative costs, advertising costs, travel costs, salaries, utilities
Revenue structure	Freemium

11.1.8 UP8 - Citizen's engagement programme using mobile app

Component name	Citizen Engagement App
Functionality	A novel mobile application targeted at citizens and professionals that provides localized guidelines, notification and other educational materials to prevent and detect forest fires.
Key features	Multiple areas of localization, notification system that provides information from various modules of the SILVANUS ecosystem, user friendly interface
Expected TRL	TRL 8

Licence	• **Closed source:** Source code is closely guarded, often because it's considered a trade secret that creates scarcity and keeps the organization competitive. Such programs come with restrictions against modifying the software or using it in ways untended by the original creators:
	  ○ Freeware
	  ○ Shareware

Owner	Massive Dynamic Sweden (MDS)
Component manager	Eleni Kotali (eleni@massivedynamic.se)

Commercial Assessment of the extension

Value proposition

Problem statement	Every country has different guidelines and fire prevention information regarding forest fires that is often difficult to find, outdated and not distributed properly to the citizens. Also, there are not many holistic notification systems in place to help detect forest fires.
Benefits	The Citizen Engagement App will provide a solution to the above problems by gathering the existing guidelines and providing new content created by national authorities of each collaborating Pilot country along with the rest of the Citizen Engagement Program team of experts of the SILVANUS Project. That way, the end users will be able to find the information that they need in an easy and organized way. They will also be notified in the events of increased fire risk in their area and whether there is an actual fire. The app will also provide the means to notify the users of other actions related to the prevention and detection of fires as well as reforestation initiatives.
Unfair advantage	Currently there are not any holistic, multi-localized applications providing both information on fire prevention and fire detection on the market. Our novel approach could create a state-of-the-art, globally relevant, multi-purposed, educational and informative platform for citizens and professionals.

Target users

Target user 1	• Citizens of all age seeking to learn about forest fire prevention, detection, and reforestation
Target user 2	• Professionals seeking to further their training and education

Competition

#	Name of competitor solution	Company	Strenghts	Weaknesses	Solution unfair advantage
1	FireFringe	FireFringe First Resource Management Group Inc.	Uses multiple satellites and layers to track and show raging fires.	Only fire detection, not reporting. No educational modules included.	
2	Fire Prevention, Education and Mitigation	National Interagency Fire Center	An educational program about the science of wildland fire, designed for students.	There is no application, so not an actual competitor. And there are no applications for educating citizens about forest fires on a multinational level at all.	

Distribution model

Distribution model	• The app will be distributed for free at the Playstore and/or Apple Store • Some indirect channels will be used as well, such as distribution through affiliated partners at Community and dissemination events
Customer contact	Promotions through the rest of the Citizen Engagement Program's channels, community and dissemination events, online promotions
Promotion means	We will raise awareness through the rest of the Citizen Engagement Program's actions

Delivery model

Delivery model	The solution will be served as an independent, cross platform mobile application provided for free at the Playstore and Apple Store

Customer relationships

Customer relationship	Self service

Financial Model

Cost structure	Indicate:
	• What is your Capex structure:
	  ○ Development License in Dev Console
	  ○ Server costs
	  ○ Mobile devices for testing
	• Opex structure:

	○ Admin costs ○ 1 Technical Leader ○ 1 Programmer ○ Travel costs for visiting pilot sides for testing • Cost estimation: ○ 50.000 euros
Revenue structure	• Pricing model ○ Open Core Model • Revenue estimation ○ It hasn't been calculated at this stage

11.2 Annex II – Individual exploitation plans

The individual exploitation plans provided by the partners can be found here. In Table 11 below the list of the 38 partners that provided their plans during this last period.

Table 11 Partners that provided their Individual Exploitation Plans

Partner #	Partner Name	Short name
2	ZANASI ALESSANDRO SRL	Z&P
3	INTRASOFT INTERNATIONAL SA	INTRA
6	ATOS IT SOLUTIONS AND SERVICES IBERIA SL	ATOS IT
7	EMC INFORMATION SYSTEMS INTERNATIONAL	DELL
8	SOFTWARE IMAGINATION & VISION SRL	SIMAVI
9	CNET CENTRE FOR NEW ENERGY TECHNOLOGIES SA	EDP
10	ADP VALOR - SERVIÇOS AMBIENTAIS, S.A.	ADP
11	TERRAPRIMA - SERVICOS AMBIENTAIS SOCIEDADE UNIPESSOAL LDA	TP
12	3MON, S.R.O.	3MON
13	CATALINK LIMITED	CTL
15	EXPERT.AI S.P.A.	EAI
16	ITTI SP ZOO	ITTI
17	IZQUIERDO/PIATRIK GBR	VMG
18	MASSIVE DYNAMIC SWEDEN AB	MDS
19	FONDAZIONE CENTRO EURO-MEDITERRANEOSUI CAMBIAMENTI CLIMATICI	CMCC F
20	EXUS SOFTWARE MONOPROSOPI ETAIRIA PERIORISMENIS EVTHINIS	EXUS
21	RINIGARD DOO ZA USLUGE	RINI
22	MICRO DIGITAL DOO ZA INFORMACIJSKE TEHNOLOGIJE	MD
23	POLITECHNIKA WARSZAWSKA	WUT
24	HOEGSKOLAN I BORAS	HB
25	GEOPONIKO PANEPISTIMION ATHINON	AUA
26	ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS	CERTH
27	PANEPISTIMIO THESSALIAS	UTH
28	ASSOCIACAO DO INSTITUTO SUPERIOR TECNICO PARA A INVESTIGACAO E DESENVOLVIMENTO	IST
29	VELEUCILISTE VELIKA GORICA	UASVG
31	POMPIERS DE L'URGENCE INTERNATIONALE	PUI
32	THE MAIN SCHOOL OF FIRE SERVICE	SGSP
34	LETS ITALIA SRLS	LETS
37	ASOCIATIA FORESTIERILOR DIN ROMANIA ASFOR	ASFOR
38	KENTRO MELETON ASFALEIAS	KEMEA
39	ELLINIKI OMADA DIASOSIS SOMATEIO	HRT
42	PERIFEREIA STEREAS ELLADAS	PSTE
43	HASICSKY ZACHRANNY SBOR MORAVSKOSLEZSKEHO KRAJE	FRS MB
45	TECHNICKA UNIVERZITA VO ZVOLENE	TUZVO
46	OBCIANSKE ZDRUZENIE PLAMEN BADIN	Plamen
47	YAYASAN AMIKOM YOGYAKARTA	AMIKOM
48	COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION	CSIRO
49	UNIVERSIDADE FEDERAL DO RIO DE JANEIRO	UFRJ

11.2.1 Partner No 2 - ZANASI ALESSANDRO SRL (Z&P)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** Founded in 2006, limited liability company under the Italian law since 2007, Zanasi & Partners (registered brand of "Zanasi Alessandro Srl") is a security research and advisory company active in EU and MENA areas. Z&P serves its customers by focusing on technology solutions. Its main clients include national and international public institutions - including LEAs and intelligence agencies - and leading technology companies. Its professionals and partners (former LEA officers, academic and industrial researchers) can rely on a two-fold background: security/intelligence and advanced technology skills. The company was appointed full member of ESRIF (European Security Research and Innovation Forum) in 2007, following the appointment of its founder to ESRAB (European Security Research Advisory Board) in 2005.
	2. Your motivation to participate in the project and commitment: Zanasi & Partners joined the SILVANUS consortium in order to be able to improve its offer, enlarging its market share and its customer base. Z&P aimed to enhance it position as a reliable partner for future research initiatives (e.g., Horizon Europe projects), increasing the company knowledge and know-how in crisis management (wildfires) as well as its network.
	3. Means to achieve your objectives: The company has participated in over 30 research projects under the European Framework Programme (FP7, H2020, HEU, EDF, EDIDP, PADR, ISF, CIPS, ISAC) and is composed by a variegated team of experts with technical (engineers, physicist, etc.) and social-political background.
	4. Opportunity which appeared/appears: The involvement of the company in task 2.6 "Assessment framework" will generate knowledge that can be re-used in other projects that the company may be involved in. At this stage the company has received funding in another Horizon project and is involved in activities similar to the ones carried out within task 2.6.
WHAT AND WHY	**5. Exploitable assets and results:** Based on the role of Z&P in the Consortium the main exploitable assets are: the knowledge that is generated during the project that can be used in future research initiatives or in advisory contracts, like the development of policies that consider regional requirements for efficient forest management; and the methodology that is developed and used in the task where Z&P is involved, namely the creation of an impact assessment framework, used to evaluate the performance of an integrated platform.
	6. Rationale: The knowledge and methodologies acquired within the project will allow Z&P to transfer the state-of-the-art know-how to its customer base and enhancing co-operation between the company and the European security industry as a whole.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: As Z&P's involvement in SILVANUS do not foresee the development of components, the main interest of the company is to fruitfully co-operate with the partners during the project and extend the co-operation in future research projects (HEU), thus increasing its network.

ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** Z&P will use the knowledge developed within task 2.6 in another HEU project (NESTLER, GA ID: 101060762), where it is involved in a similar activity. Additionally, the company has already contacted partners of the Consortium for preparing proposals in other HEU calls for proposal and will keep considering them for future calls.
	9. Measurement: The impact of planned actions will be measured comparing the organization's turnover and headcount before and after the project SILVANUS.
	10. Positioning: N.A.

11.2.2 Partner No 3 - INTRASOFT INTERNATIONAL SA (INTRA)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** Netcompany-Intrasoft is a leading European IT Solutions and Services Group with strong international presence and expertise, offering innovative and added-value solutions of the highest quality to a wide range of international and national public and private organizations. The Company's Head Offices are located in Luxembourg (2b rue Nicolas Bové, L-1253 Luxembourg). Netcompany-Intrasoft (previously known as INTRASOFT International) was founded in 1996 by Intracom Holdings and remained a member of it until October 2021. As of November 2021, Netcompany-Intrasoft became a member of the Netcompany Group, a Denmark located IT company founded in 2000. Netcompany is the fastest growing and most successful IT services company in the Nordics, owning vast technology experience and deep industry-specific knowledge, creating innovative solutions tailored to meet business goals. Netcompany-Intrasoft employs more than 2,800 highly skilled professionals, representing over 50 different nationalities and mastering more than 30 languages. With headquarters in Luxembourg, Netcompany-Intrasoft operates through its operational branches, subsidiaries and offices in 13 countries: Belgium, Bulgaria, Cyprus, Denmark, Greece, Jordan, Kenya, Luxembourg, Romania, RSA, UK, UAE and USA. More than 500 organizations in over 70 countries worldwide (Institutions and Agencies of the European Union, National Government Organizations, Public Agencies, Financial Institutions, Telecommunication Organizations, and Private Enterprises) have chosen the company's services and solutions to fulfill their business needs. Netcompany-Intrasoft's expertise and strength lie in its proven capacity and successful track record in undertaking and delivering, complex, mission - critical projects. Netcompany-Intrasoft's professionals have developed the ability to combine their technical expertise with thorough understanding of each customer's individual business needs. The company consists of a highly skilled, efficient and flexible human resources base, with an international culture. For more than 20 years, Netcompany-Intrasoft actively contributes to the development of innovative pre-industrial products and services through its participation in EU Research Programmes. We possess a successful track record in managing large and complex collaborative research projects, implementing innovative research prototypes, and effectively communicating research results in Europe and beyond. Serving this mission, the Research and Innovation Development (RID) Department contributes to the

strategic policy objective of enabling Europe to master and shape future developments in ICT, while sustaining the company's leadership in ICT.

Research is conducted by in-house and associate consultants, in conjunction with prestigious universities and research institutions, and acclaimed industrial partners that ensure the articulation of emerging ICT trends into innovative and exploitable research outcomes. As a result, Netcompany-Intrasoft offers an interdisciplinary centre of competence on the effects, use and applications of ICT in our targeted markets with a medium to long-term agenda.

The RID Department works in close collaboration with other Netcompany-Intrasoft teams, to bring technological and business innovation within the Group. The company continuously monitors new technological trends where RID is dealing with the development and assessment of innovative pre-industrial products and services. Starting in 2015, INTRASOFT International has taken a step further by investing even more in innovation and R&D both internally, but also through participation in venture capital funds and start-ups.

Netcompany-Intrasoft has extensive R&I activities related to Big Data, Data Analytics and AI.

Indicatively, Netcompany-Intrasoft participates with key roles in Big Data H2020 lighthouse projects in the areas of bioeconomy, manufacturing and transport. Netcompany-Intrasoft is heavily investing in Big Data. Currently, a Big Data virtual team has been created with representatives from business units across the company. The virtual team is responsible for exploring and developing opportunities related to Big Data pertinent to all company activities. This approach aims to transform corporate culture in such a way that all decisions, both business and technical will ultimately become data driven. Recently Netcompany-Intrasoft has founded the Data Analytics Competence Center providing data science and data engineering professional services to all market segments that the company covers in cooperation with its BU sales teams and delivery groups, which is enforced by the recent strategic collaboration with the startup Incelligent. Netcompany-Intrasoft is further a member of BDVA.

2. Your motivation to participate in the project and commitment:

INTRA through its participation in this project seeks to further extend and augment its assets in diverse application domains:

- Data toolkit for decision support – as INTRA is strategically active in big data and AI technologies, continuously seeking to apply such technologies in new markets/domains and identify new stakeholders such as SILVANUS partners
- MAGNET integration toolset to support the activities in WP8 will be further developed and tested in this domain.

3. Means to achieve your objectives:

INTRA is the leader of T5.4: Data toolkit for decision support system that aims to develop an analytic algorithm, which can process high-speed, high-volume signals captured by SILVANUS sensors deployed across the forest and Leader of WP8: Platform design specification, interfaces and integration, within which the architecture specification of the platform will be defined, and the integrated SILVANUS interdisciplinary forest landscape management platform will be developed. This is based on the company's capacity as a SW house to develop complicate software systems. Netcompany-Intrasoft has extensive R&I activities related to Big Data, Data Analytics and AI.

4. Opportunity which appeared/appears:

One of the mandate that INTRA aims to fulfil through the participation in this project is to scan this new domain for an opportunity to further exploit the PoC to be developed under SILVANUS. In addition, SILVANUS can be used for INTRA as a new entry point to explore a new market, as the one that SILVANUS tackles.

WHAT	**5. Exploitable assets and results:** Data toolkit for decision support and the overall SILVANUS platform.
	6. Rationale: Why has been addressed above. Seeking to release any SW under a license.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: We are part of the MVP1 fire and smoke detector and the 2 segmenter. (related to the fire index and the fire advance prediction algorithm)
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** M22- M30 are still development phases.
	9. Measurement: Number of commercial actions.
	10. Positioning: TBD

11.2.3 Partner No 6 - ATOS IT SOLUTIONS AND SERVICES IBERIA SL (ATOS IT)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** Atos is a global leader in digital transformation with 112.000 employees in 72 countries. European number one in Cloud, Cybersecurity and High-Performance Computing, the Group provides end-to-end Orchestrated Hybrid Cloud, Big Data, Business Applications and Digital Workplace solutions through its Digital Transformation Factory, as well as transactional services through Worldline, the European leader in the payment industry. Within Atos Research & Innovation (ARI), node of R&D at Atos in Spain, there is technology transfer and business development team that works on transition from research results to Atos global portfolio and service lines.
	2. Your motivation to participate in the project and commitment: One of the motivations for ATOS is to enhance our in Artificial Intelligence product portfolio in Smart visión as part of the company's commercial offer included in the CODEX business line **(**Atos Codex, Connected Intelligence - Atos**)**
	3. Means to achieve your objectives: ATOS has background knowledge in the asset is bringing to SILVANUS • Fire and smoke detector on edge devices • Terrain segmentation using drones or satellites images During the project these assets will additionally developed

	4. Opportunity which appeared/appears: Fire and smoke detector on edge devices and the terrain segmentation using drones or satellites images will extend and enhance the commercial offer of the BDS (Big Data, mission-critical systems and Cybersecurity) business line in ATOS.
WHAT AND WHY	**5. Exploitable assets and results:** • **Fire and smoke detector on edge devices**: Detects fire and smoke using drones, satelites or camera based images. The algorithms can be executed in Edge AI devices with GPU capabilities, in the edge (powerful laptop) or in the cloud. • **Terrain segmentation using drones or satellites images**: Segments the terrain, separating forest, different kinds of trees (by color), paths, burn terrain and other features • **Tool to detect fire mentions and images e in the social networks**
	6. Rationale: With the development of these assets, ATOS will be in a position to provide a wider commercial offer on his Artificial Intelligence product portfolio in Smart vision as part of the company's commercial offer included in the CODEX business line **(**Atos Codex, Connected Intelligence - Atos)
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: ATOS components are part of the MVP1 fire detector and smoke and MVP 2 segmentation (related to fire index and the algorithm of prediction of fire progress).
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** The target TRL by the end of the project will be 6/7 with the intention to additional develop during the following 6 month after the project end to TRL 8/9.
	9. Measurement: Number of commercial opportunities schedule with the company portfolio customers.
	10. Positioning: TBD

11.2.4 Partner No 7 - EMC INFORMATION SYSTEMS INTERNATIONAL (DELL)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** EMC Information Systems International is a member of the Dell Technologies family of businesses, which provides essential IT infrastructure for organizations to build their digital solutions. We enable enterprise and SME customers to transform their digital technologies through trusted hybrid cloud and big-data solutions, built upon a modern data center infrastructure that incorporates industry-leading converged infrastructure, servers, storage, networking, IoT and cybersecurity technologies.
	2. Your motivation to participate in the project and commitment: Dell understands that providing hardware and software solutions alone will not address our customer's needs. Rather than trying to build a complete solution ourselves, Dell believes in collaborating with other skilled partners to build best in breed solutions for its customers. Therefore, Dell engages with standards organizations, industry bodies, and projects like SILVANUS: firstly to develop solutions based on

	consortium of skilled partners and secondly to develop longer term relationships for continuing our collaboration into the future.
	3. Means to achieve your objectives: The EMC Information Systems International research group based in Cork, Ireland, is one of ten research groups round the World and its part of the Office of the CTO. Our function is to evaluate emerging technologies and solutions, looking for disruptive technologies that can be fed into our business units to develop new products and services. Our group of research scientist in Cork have many years of experience in developing research projects to PoC level and passing that work on to be incorporated into new or existing solutions. We can also draw on expertise of other researchers from around the globe, as well as the development and manufacturing site in Cork, Ireland, where we are co-resident.
	4. Opportunity which appeared/appears: Our initial exploitation centered around the Big-data framework, as Intelligent Data Management is one of Dell's research strategies. In particular the development of an intelligent metadata index (object catalogue), which understands the content of unstructured data objects and facilitates expressive search facilities, as well as managing object life cycles. Dell was involved in developing Edge solutions for SILVANUS, primarily around the IoT Gateways, and to a lesser extent the Edge Micro Data Centres for use in the forward command centre during Phase B of the wildfire. Originally Dell was only involved in a limited way and was not providing any equipment for the pilots. However, it became clear in the first year that the provision of an integrated Edge solution was important for the success of SILVANUS. So, the Dell research team applied for internal funding (within Dell) to purchase 5 Dell XR12 servers, which are designed to operate outside of the data centre (i.e. the EMDCs), and 16 of Dell's latest 5200 IoT gateways. This will allow us to develop the SILVANUS solution at the Edge, and how Dell's hardware can be deployed in challenging Edge environments, e.g. the SILVANUS pilot sites.
WHAT AND WHY	**5. Exploitable assets and results:** It is intended that the results and knowhow from developing the intelligent metadata index will feed into the broader Dell IDM work to build the next generation of distributed data storage solutions, which will focus heavily on unstructured data stores. Additionally, and unexpectedly, the opportunity presented itself to demonstrate Dell's Edge hardware equipment in actual field conditions in the Pilot sites, which shows how the full SILVANUS software stack can be deployed and remotely managed on Dell's equipment.
	6. Rationale: It is estimated that today 80% of the worlds data is unstructured and is likely to rise to 90% over the next few years. Managing this amount of unstructured data is challenging as it can't be searched and retrieved in the conventional way, but often requires bespoke applications. Additionally, the concept of pulling all an organizations data into a single data lake is fading. Future organizations will require flexible data storage, management and retrieval solutions that may be distributed across multiple internal departments, third-parties and cloud storage providers. Dell has started on the road of abstracting all an organization's distributed data assets behind a single common interface as part of project APEX (https://www.delltechnologies.com/asset/en-gb/solutions/apex/briefs-summaries/apex-brochure.pdf), but more sophisticated file systems will be required to meet the challenges of extreme amounts of unstructured data. The Intelligent Metadata Index is a key part of demonstrating and implementing that solution. The next generation of Dell's IoT Gateways, the 5200 range, have just been released onto the market. So, it is a serendipitous opportunity to demonstrate them in potentially hazardous environments, as part of the SILVANUS pilots.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: Dell has a long history of close collaborative partnerships to implement complete solutions that they could not build alone. In addition to its hardware projects and AI technical knowhow. The Dell research group in Cork have a long history in FP7 and H2020 projects of building and integrating Cloud and Edge platforms.

	So, we can help de-risk the integration of the SILVANUS project by applying experience from past projects to the benefit of other partners, and ourselves. For example, we have worked with Intrasoft on other projects to implement scalable cloud platforms. The confluence of the two branches of AI, Machine Learning and Knowledge Representation, is an emerging but challenging area of research and development. Dell has worked in both areas for many years, but experts in Semantic Graph technologies are few, an academic training almost non-existent. So, the chance to work with likeminded companies across Europe, such as Catalink, Fincons and Expert AI, on the combination of ML and KR, may lead to future ventures.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** By months M22-M30 we aim to have published several white papers on the use and application of Dell's Edge platforms, IoT Gateways and XR12 servers, ideally in partnership with other SILVANUS partners. The plan is to demonstrate to our customers, using actual pilots, how the platforms can be practically deployed at the Edge. The 5200 gateway is particularly well suited to hazardous environment as it is passively cooled, i.e. does not use ducked air to internally cool the processors and other electronics. There is a reluctance among customers to move servers out of the data centers and closer to the source of data and where it is best processed; the white papers will provide concrete examples of how and where this can be done. We intend to present the initial SILVANUS solution at our internal technical conference in October around M14, and then every six months. The internal technical conference is a closed bi-annual event, where research and advanced development groups, like ourselves, present there work to the business units and the global technical community in Dell.
	9. Measurement: By working with the Edge business unit, we aim to evaluate the impact of the Dell publications on the sales of Edge platforms, particularly the new 5200 IoT Gateways, as this is a brand-new product, which we are launching onto the market. By the final year we aim to have started engagements with the storage business unit to transition our results into the development teams, although this can be challenging as development roadmaps often stretch out for many years.
	10. Positioning: Sorry I am not permitted to discuss competitor's products outside of Dell Technologies.

11.2.5 Partner No 8 - SOFTWARE IMAGINATION & VISION SRL (SIMAVI)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** Software Imagination & Vision (SIMAVI) is a Romanian large software company that provides IT services to the European Commission. SIMAVI is specialized in developing innovative IT solutions and implementing complex IT projects for education, health, customs organizations (eCustoms), European institutions, private companies and public sector. The major areas of expertise are the following: eLearning, eHealth, eCustoms, R&D, EAS, Security. As technical partner, with strong expertise in business development / commercial area, SIMAVI intends to ensure the project sustainability and provide resources in the post-project period. The main capabilities of SIMAVI are the following: - Software development - Software integration - AR/VR and digital content development for training - Develop business plans and exploitation strategies - Support in pilot implementation.

	2. Your motivation to participate in the project and commitment: As technical partner, SIMAVI is involved in all stages of the project implementation, namely: analysis and design, development, testing, end-users training and technical support. SIMAVI staff consists of IT specialists with complementary technological capabilities: IoT, Analytics, Big Data, Data mining, Cloud computing, Decision Support Systems, Graphical User Interfaces, UX design, Virtual Reality (VR), Augmented Reality (AR), Serious Games and Training. Within the project, the major involvement of SIMAVI is in stage ***A. Prevention & Preparedness***, where we coordinate the activities of WP3 - Culture of deterrence and prevention against wildfires based on sustainable forest management services. The training programmes developed using the AR/VR solution will be delivered to the first responders (fire fighters).
	3. Means to achieve your objectives: SIMAVI will support the marketable products and services by its own specialized resources (departments / staff, infrastructure). SIMAVI is capable to contribute and sustain and sustain the joint efforts of exploitation and sustainability plans of SILVANUS after the end of project with specific resources - IT specialised personnel (project management, continuous development, customization and testing, technical support, training) and sales & marketing specialized personnel.
	4. Opportunity which appeared/appears: The exploitation strategy of SIMAVI considers the business relationships already developed with the clients of the company and will be oriented at the same time toward the potential clients identified on different occasions for emergencies/ critical situations and critical infrastructure domains (seminars, conferences, workshops, demos, etc.). Both external and internal opportunities will be addressed as presented in Section 5.
WHAT AND WHY	**5. Exploitable assets and results:** Five choices were analyzed for the exploitation of SILVANUS project results, namely: - Further R&D&I projects (e.g. knowledge transfer, know-how, technological approach, components, parts of developed software applications, algorithms...) - Customizations (Tailor-made extensions for customers) - Sales and marketing - Licensing (AR/VR solution) - Partnerships.
	6. Rationale: SIMAVI intends to exploit the results of SILVANUS project both industrially and academically, as follows: - Internal use in SIMAVI (for testing purposes, further research and future products / services) - Reuse of know how - Sales of marketable products (AR/VR solution) and services (training, technical support, consultancy) - Licensing (AR/VR solution) - Partnerships-collaborations in future relevant projects (commercial or research/innovation).
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: Our Value Proposition towards Joint Exploitation of SILVANUS is closely related to the implementation stage A. Prevention & Preparedness and is defined by: - Strong collaboration with partners for implementing the activities from WP3 and WP5 - Relevant expertise in developing AR/VR solutions and training through AR/VR

	- Modeling and implementing smart algorithms (Task 3.2) - Relevant experience in implementing Big data solutions (Task 5.1) - Support in pilot implementation.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** - Drafting an appropriate Plan for communication and dissemination - Benchmarking analysis for AR/VR platforms / solutions - Define the business model - Define the Value Proposition - Define marketing strategy (segmentation, target groups, positioning) - Identify the specific key partners and the most suitable delivery channels for reaching the targeted customer segments
	9. Measurement: Too early to define.
	10. Positioning: A preliminary benchmarking analysis was performed in order to identify similar AR/VR products / solutions existing on the market and compare their features with the ones of SILVANUS in order to determine its distinctive and innovative particularities and capabilities. This analysis will be extended in the next period, in accordance with the specificity of the market sector to which we are addressing in the project. 1. Glue (https://www.glue.work) Helsinki-based Glue Collaboration is a company founded in 2018 which is developing remote collaboration tools for AR / VR. 2. Scotty (https://www.scotty.expert/en/) Scotty is a innovative solution designed to help industrial maintenance keep its business running and perform efficient maintenance and remote support operations thanks to Augmented Reality. It is based in Puglia and allows to guide, train and monitor front-line workers with divers devices like smartphone, tablet, Microsoft Hololens and other smart glasses. 3. ENGAGE (https://www.engagevr.io/) ENGAGE is a company founded in 2015, based in Ireland, which developed a VR-based corporate education and training platform, offering educators and companies to host meetings, presentations and events with people around the world. 4. InnoChain ETN (http://www.innochain.net) InnoChain ETN is a research training environment created to explore how the progress of digital design tools results in building a culture that provides sustainable, informed and materially smart design solutions. The community network aims to train a new generation of interdisciplinary researchers, with a strong focus on industry, who can produce real changes in the thinking, design and construction of the physical environment. 5. YORD STUDIO (https://www.yordstudio.com) YORD is a global creative company founded in 2019 in Czech Republic specialized in offering virtual and augmented reality services, 3D projects, visualization, virtual showrooms and metaverse. 6. Crystal Apps (https://www.crystalapps.eu) Crystal Apps is a company founded in Poland in 2018, which is focused on developing virtual, augmented reality and high-end games, offering exclusive solutions for marketing, PR, education and entertainment. 7. 4Experience (https://4experience.co/) 4Experience is an innovative company founded in 2015 in Poland which develops virtual and augmented reality and offers complete solutions and software development services at the highest quality on a diversity of platforms and devices. The company skills are in developing applications with Unity 3D (C #), virtual reality with Oculus Quest, HTC Vive, HTC Vive Pro, Oculus Go, Oculus Rift, Samsung Gear VR, Daydream, PicoNeo, Cardboard, augmented reality with ARKit,

ARCore , Vuforia, mixed reality with Microsoft Hololens, Magic Leap, Mira Prism, Dreamworld Glass, Vuzix Blade, but also 3D design with 3Ds Max, Maya, Blender, ZBrush, Photoshop, Snap Studio3D.

8. WE / AR Studio (https://www.wear-studio.com)
   WE/AR Studio is an Estonian company founded in 2015, which is a full-cycle XR development agency specializing in building customized AR, VR and MR experiences to meet the needs of businesses in various industries. The company offers AR and VR developments, rapid prototyping, ideation services, AR / VR data analysis and XR strategy.
9. Delta Reality (https://www.deltareality.com)
   Delta Reality is a company founded in 2013 in Croatia which develops creative solutions using virtual reality, augmented reality and mixed reality. One of their representative solutions is VR Firefighting Training designed for the Virtual Academy of Linde (industrial gas and engineering company).
10. Zappar (https://www.zapar.com)
    Zappar, founded in 2011 in United Kingdom, is a creative studio platform that creates innovative AR/VR experiences for some of the largest brands in the world. The company has a large portfolio of solutions dedicated to various business domains like: retail, packaging, marketing, events, tours and atractions, and learning & development.
11. Khora Virtual Reality (https://www.khora.com)
    Khora, founded in 2016 in Denmark, is the leading Scandinavian studio of real virtual reality and augmented reality, which creates state-of-the-art content in a multiple application areas. The company has a large portfolio of solutions dedicated to various business domains like: marketing, training, simulation & construction, healthcare, museums & tourism, education and art.

11.2.6 Partner No 9 - CNET CENTRE FOR NEW ENERGY TECHNOLOGIES SA (EDP)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** EDP NEW R&D - Centre for New Energy Technologies is EDP's Research and Development Center. EDP – Energias de Portugal is an integrated energy utility, with a global presence that includes operations in Europe (especially focused on Portugal and Spain but with relevant positions in France, Belgium, Italy, Romania, Poland and UK), in the United States and in Brazil. EDP NEW R&D is a subsidiary of the EDP Group with the mission to create value through collaborative R&D in the energy sector. EDP NEW R&D is entirely committed to research and development with a strong focus in technology demonstration projects. The result of an internal reorganization process in 2014, EDP NEW R&D centralizes the Group's R&D activities and is established inside EDP LABELEC – EDP's laboratorial facilities and technical excellence centre. EDP NEW R&D has carried out work in several EU H2020 in all the Energy value chain, adopting an integrated and sustainable approach towards disruptive solutions that empower its partners and bring value to the shareholders.
	2. Your motivation to participate in the project and commitment: EDP's main activity involves all the energy vertical from generation to commercialization in exception of the High Voltage transport, which is managed by other company. EDP has many assets – lines, generation plants, transformers, buildings – which by being dispersed in the territory are exposed to fire risk and extreme weather natural disasters. In the Portuguese SILVANUS pilot region, EDP has many assets which perform critical services, such as electrical energy supply to isolated villages or isolated houses, but most important provide electrical energy to firefighting activities such as communications and water supply. EDP's motivation to join SILVANUS was to develop and access innovative IT tools to prevent fire that might affect critical infrastructures. EDP identifies in SILVANUS a golden opportunity to develop tools that integrate the IT in data processing and artificial intelligence with the OT in physical infrastructures.

WHAT AND WHY

3. Means to achieve your objectives:

NEWR&D has a team of circa 50 professionals, ages spanning from early twenties till sixties, with a wide variety of technical skills, most of them are McS with distinction, about 12 have PhD, and about 3 are PhD candidates. A considerable number has top class MBA's or Management Masters.

NEWR&D works closely with LABELEC, the company that that owns and operates EDP's laboratorial facilities and technical excellence centre, considered among the best in the EU.

EDP NEW R&D has proved competencies in cross-cutting topics, such as Digital tools and projects development, IT architecture design, new use cases development, new business models' development and implementation, validation of technologies in laboratorial environment or demonstration in real conditions.

EDP group a global utility owning widespread generation - hydro, wind and PV - and distribution assets worldwide thus has a large knowledge on electrical critical infrastructures.

4. Opportunity which appeared/appears:

NEW R&D works with all EDP business units leveraging the knowledge acquired in each research project. In SILVANUS the knowledge generated is expected to

- Enhance the fire protection of: lines, electrical substations, generation units: wind, PV and hydro.
- Enable the design and maintenance of safety corridors around EDP's assets.
- improvement efficiency of both Energy application and Safety prevention (E.g. recognition of vegetation growth avoiding decrease of wind turbines' efficiency due to shear effect, besides placing danger to both machine and organic body).
- Improve vegetation management in the overhead line's vicinity through AI detection of vegetation species, prediction of their growth - reducing more than 15% maintenance costs related with the observation activity. Allied to proper and coordinated forestry maintenance strategy in the region, e.g. involving grazing activity, Utility cost may decrease by 25%.

Improve the use of drones to perform aerial inspections, replacing namely helicopters, and with higher degree of autonomy (less human intervention needed and less risk) and of digitization (enabling more automatization of the analysis with better results) will allow EDP to explore and develop new services to improve the management of utilities' physical assets.

5. Exploitable assets and results:

The SILVANUS outputs (assets) that have the potential to be exploited by EDP are:

- Wireless sensor for early-stage wildfire detection(T4.3)
- Surveillance deployment using UAVs(T4.6)
- Forest landscape management model and the vegetation growth model (T2.3)
- The fire danger index computational framework(T3.2)

These can be operationalised in two products/services:

- Forest Fire Prevention IT Tool – FF Tool
- Forest Fire Prevention and Fighting data service – FF Service

	Product description	Inputs	Outputs
FF Tool (Forest Fire Prevention IT Tool)	· User friendly interfaces · Modular design – allows adding new features · More suitable for continuous surveillance of critical assets	· Meteo data · Geophysical data · Biophysical data (vegetation, biodiversity, orography, etc.) · On-line site data (can be through tele continuous monitoring, e.g. via local cameras) · Fire models	· Fire ignition information: location, intensity, progress, etc. · Vegetation status Information - alert when critical threshold is passed.
FF Service	· Consulting Service – one off or regular base (depends on the specific system dynamics)	· Site data · Image processing toolkit	· Information assets current and future exposure to Fire risk

(Forest Fire Prevention and Fighting data service)	· More suitable for one time or intermittent surveillance of spread scattered non-critical assets		

	Key users beyond EDP	Pre-conditions	Legacy potential
FF Tool	· Utilities · Municipalities · ONG · Farmers	· Access to input data (meteo, vegetation, orography, etc.) · Processing machine (for massive data)	· Access to tool upgrades and maintenance
FF Service	· Utilities	· Image processing toolkit · Access to drones	· Access to tool upgrades and maintenance

6. Rationale:

EDP has the potential to exploit several SILVANUS outputs, by using them in their current activity or by the design of products that can be commercially exploited:

- Wireless sensor for early-stage wildfire detection(T4.3) – Applied in electrical assets (electrical lines and substations, wind, PV and hydro generation units:) –enables a more effective fire management (early detection) – exploited by integration in the current operations
- Surveillance deployment using UAVs(T4.6) – Applied in electrical lines – enables prediction of vegetation growth and consequent vegetation management improvement (fire prevention) – exploited by integration in the current operations
- Forest landscape management model and the vegetation growth model (T2.3) – Applied in electrical assets (electrical lines and substations, wind, PV and hydro generation units:) – enables a more efficient vegetation management-) – exploited by integration in the current operations
- The fire danger index computational framework(T3.2) – Gives insights that can improve Fire risk management through a more efficient vegetation management, enables a more effective fire management (early detection)

7. Your Value Proposition towards Joint Exploitation of SILVANUS:

NEWR&D can:

- Perform testing of products/services in real demos.
- Drones fleet available
- Share the vegetation models

ROADMAP WITH TIMELINE

8. Roadmap: the timeline plan you have for using those assets:

Product	1st sem 2022 (June)	2nd sem 2022 (Dec)	1st sem 2023 (June)	2nd sem 2023 (Dec)	1st sem 2024 (June)	2nd sem 2024 (Dec)	1st sem 2025 (June)	Beyond SILVANUS end
The SILVANUS platform (WP8)								
VR training platform for firefighters (T3.4)								
Citizen engagement toolkit(T3.5)								
Wireless sensor for early-stage wildfire detection(T4.3)								
- Value proposition evaluation								
- Client's identification								
- Product definition								
- Business model ideation								
- Product commercialization								
Surveillance deployment using UAVs(T4.6)								
- Value proposition evaluation								
- Client's identification								

- Product definition								
- Business model ideation								
- Product commercialization								
Forest landscape management model (T2.3)								
- Value proposition evaluation								
- Client's identification								
- Product definition								
- Business model ideation								
- Product commercialization								
Decision support system for rehabilitation strategy (T6.3?##)								
The vegetation growth model (T2.3)								
The fire danger index computational framework(T3.2)								
- Value proposition evaluation								
- Client's identification								
- Product definition								
- Business model ideation								
- Product commercialization								

9. Measurement:

The SILVANUS Exploitation Key performance indicators are presented in the following table:

	KPIs - description	KPI	Comments
FF Tool	· Deliver of a beta version of the tool · # BU using the tool	· Before M42 · > = 1	· The delivery of a beta version of the tool and its use on at least one BU fulfils the KPI
FF Service	· Technical specification of the service · # 1 BU supplying the service	· Done · Done	· The delivery of an initial version of the service and its availability in one BU fulfils the KPI

10. Positioning:

N/A

11.2.7 Partner No 10 - ADP VALOR - SERVIÇOS AMBIENTAIS, S.A. (ADP)

QUESTIONS

PROFILE AND MOTIVATION

1. Partner profile:

AdP VALOR is a Shared Services Company of Águas de Portugal Group, a leading group in the environmental sector in Portugal. The company's mission is to provide shared services to the Group water utilities, looking for synergies and size factors to effectively address the environmental related societal challenges.

The core AdP Group activity involves the integrated management of the urban water cycle and spanning all of its respective stages, ranging from water abstraction, treatment and distribution for public consumption to the collection, transport, treatment and disposal of urban and industrial wastewaters, including their recycling and reuse. The Group is responsible for the management of several thousand infrastructures including more than 150 WTP, 1 000 WWTP, and 2 500 water and wastewater pumping stations in Portugal. Through its different utilities, the Group has a nationwide presence, from the north to the south of Portugal, providing services to 80% of the Portuguese population through municipalities that simultaneously serve as shareholders in the companies managing multi-municipal systems (bulk systems), and directly serving the populations through municipal systems (retail systems) providing water and sanitation services.

	The Group has recently announced its plan to become energy neutral by 2030, which makes it the first group in the world in the water sector with a strategy to achieve energy neutrality in 2030 based on consumption reduction through energy efficiency measures and by producing the energy necessary for its activities through 100% renewable energy self-production. The experience of AdP Group in R&D and innovation activities include participation in several National and International projects, and international awards recognition (e.g., Water and Energy Exchange - WEX Global, Leading Utilities of the World - LUOW). AdP distinguishes itself as a support company to provide added value to the AdP utilities developing cutting edge innovative and smart solutions, with special focus on smart technologies.
	2. Your motivation to participate in the project and commitment: AdP Group Manages several thousands of assets in remote areas. These utilities are obliged to do forest fuel management and report it to relevant authorities on a weekly basis Having a tool to do this automatically will allow to save significant labor hours as well as increase the processes efficiency. By preventing tat AdP assets (water abstractions and intakes, treatment plants, pumping stations, water reservoirs, wastewater treatment plants. etc) get damaged by forest fires, millions of Euros and probably some lives will be saved. A relevant externality is that these fuel management activities will contribute to deliver water supply service without disruption.
	3. Means to achieve your objectives: AdP VALOR has a R&D department, with a wide variety of technical skills, most of them are McS with distinction. AdP VALOR R&D team has strong background experience in a wide range of water and wastewater assets management activities and projects, including implementation of IoT tools and Digitalization processes. Most recently, AdP VALOR have been developing projects aiming to better understand and mitigate the forest fire impacts in both raw water and water key infrastructures. AdVT as AdP VALOR linked third party, has a long track record of weekly fuel management inspection, management and reporting activities.
	4. Opportunity which appeared/appears: Enhance the fire protection of water infrastructures. Improve vegetation management in the water infrastructures´ vicinity through AI detection of vegetation species, prediction of their growth - reducing the maintenance costs related with the observation activity. Improve the fuel management activities planning and efforts, reducing unnecessary site visits and inspections
WHAT AND WHY	**5. Exploitable assets and results:** The SILVANUS outputs (assets) that have the potential to be exploited by ADP are: - Forest landscape management model and the vegetation growth model - The fire danger index computational framework - Climate sensitive forest models for impact on forest management - Formalization of sustainable and resilient forest management knowledge models
	6. Rationale: AdP has the potential to exploit several SILVANUS outputs, by using them in their current activity or by the design of products that can be commercially exploited:

Forest landscape management model and the vegetation growth model – Applied in water assets– enables a more efficient vegetation management and expedite the periodic status reports – exploited by integration in the current operations.

The fire danger index computational framework – Gives insights that can improve Fire risk management through a more efficient vegetation management, enables a more effective fire management (early detection)

7. Your Value Proposition towards Joint Exploitation of SILVANUS:

- AdP VALOR can:
- Perform testing of products/services in real demos.
- Contribute to the vegetation models and share the experience in fuel management methodologies and strategies in the vicinity of critical water infrastructures, some of them also important for firefighting activities.
- Dissemination of SILVANUS product outcomes through AdP´ network, and key players and authorities within the environmental sector

ROADMAP WITH TIMELINE

8. Roadmap: the timeline plan you have for using those assets:

Product (AdP)	1st sem 2022 (June)	2nd sem 2022 (Dec)	1st sem 2023 (June)	2nd sem 2023 (Dec)	1st sem 2024 (June)	2nd sem 2024 (Dec)	1st sem 2025 (June)	Beyond SILVANUS end
The SILVANUS platform								
Citizen engagement toolkit								
Forest landscape management model								
- Value proposition evaluation					x			
- Client's identification						x		
- Product definition							x	
- Business model ideation							x	
- Product commercialization								x
The vegetation growth model								
The fire danger index computational framework								
- Value proposition evaluation					x			
- Client's identification						x		
- Product definition							x	
- Business model ideation							x	
- Product commercialization								x

9. Measurement:

This impact will be measured using the following indicators:

- Obtaining a digital, autonomous and remote operated tool based in satellite images to support the fuel management planning activities surrounding the critical water infrastructures, by periodically and autonomously collecting and processing satellite images.
- A digital tool to gather, harmonize and processing data able to evaluate fire risk on a continuous basis by automated and independent risk evaluation solutions.

10. Positioning:

N/A

11.2.8 Partner No 11 - TERRAPRIMA - SERVICOS AMBIENTAIS SOCIEDADE UNIPESSOAL LDA (TP)

QUESTIONS

PROFILE AND MOTIVATION

1. Partner profile:

Terraprima - Serviços Ambientais (TP) is a SME that started as a spin-off from Instituto Superior Técnico (IST), University of Lisbon. It was created in 2008 by Tiago Domingos, its director, whose vision identified an opportunity for the provision of environmental services by agricultural activity. TP mission is to contribute to the sustainability of agriculture, through the promotion of environmental services by the farmers. TP designs and implements integrated systems to compensate for environmental impacts resulting from human activities. Also, TP is part of the group holding Terraprima – Serviços Agrícolas (TPAgr), that manages Quinta da França (QF), a 500 ha agroforestry farm in Covilhã, Portugal, where environmental and sustainability demonstration projects are implemented.

TP has large experience in R&D projects, working directly with the sector stakeholders, policy makers, farmers, universities, and agroforestry associations. The projects where TP operates use environmental services to promote the sustainability of agricultural farms, in its three pillars (environment, society and economy), and are related to: climate change; soils; agriculture and forests; life cycle assessment; modelling; precision agriculture with GIS and IoT support systems. TP also develops software to calculate the farm carbon footprints.

2. Your motivation to participate in the project and commitment:

TP activities are mostly related to agroforestry 4.0, with in its "Grazing for Sustainability" approach, which uses ruminant animal grazing and innovative technological solutions, that are supported by remote detection, earth observation, IoT sensors, data modelling, and data analysis, to promote ecosystem services and a sustainable agroforestry production.

Quinta da França (QF) is a productive 500 ha farm with multiple land uses (annual crops, sown and natural pastures, forest; beef cattle production and dairy sheep) and with scientific research and technological implementation strategies, toward a more environmentally sustainable production. In QF, a 280 ha mixed, predominantly oak forest (*Quercus pyrenaica*) and some maritime pine trees (*Pinus pinaster*), provides multiple ecosystem services (e.g. wild landscape, soil protection, water infiltration, carbon sequestration, etc), and is also an important food resource area with natural pastures. Grazing with cattle in the forest has there been shown to contribute to reduce biomass (creating horizontal and vertical biomass discontinuities), without disturbing the natural ecosystem's functionalities, and increasing protection and resilience to forest fires.

Thus, for TP it is important to participate in the SILVANUS project and contribute with an experimental pilot site in QF, for the research and development of tools that can help to reduce forest fire risk, help forest management, and improve forest adaptation/restoration.

TP joined the SILVANUS project as SME partner in the Portuguese Pilot consortium and the main role is to implement a demonstrative action plan at Quinta da França, as experimental and operational pilot farm site, mainly for testing the use of sustainable agroforestry technologies with 4.0 grazing strategies (together with the IST-ID research partner), for forest fire prevention and for critical infrastructure protection (electrical lines – EDP partner; and water facilities – AdP partner), in project Phase A, and for forest restoration/adaptation, in project Phase C.

Our commitment is to guarantee in QF the place and the resources for testing the Portuguese Pilot site activities, to contribute with data collection and data processing for the development of vegetation and fire models, that can be tested in the Portuguese Pilot region (Cova da Beira), to disseminate the SILVANUS project, and overall, to contribute to the development of the SILVANUS platform.

3. Means to achieve your objectives:

TP is an IST Spin-off and has a long experience in leading R&D agroforestry projects, which have provided it with a significant stakeholder network, moreover with a consistent list of partners, namely farmers, research institutes, and experience researchers and consultants.

TP's team has a background in agronomy, engineering, and natural sciences, comprising environmental and biophysical engineering, biology, software engineering and agroforestry management.

TP has three offices in Portugal, in Lisbon, in Porto Alto (Alentejo region), to be closer to the research partners and farmers, and in the Quinta da França (QF) pilot farm, where it holds has multiple agriculture infrastructure and equipment.

In QF there are agricultural and forest land uses, namely a 280 ha mixed, predominantly oak forest, where half is grazed by cattle, and the other half is not grazed, that can be used for testing the grazing effect. In this oak forest there are some artificial infrastructures (roads, firebreaks, unoccupied old houses, fences, railroad with electric and communications poles and lines), that can be an example for the infrastructure protection research.

The agricultural equipment in QF includes: agricultural tractors; commercial light vehicles; 10 ton trailer; centrifugal fertilizer spreader; Variable Rate Technology fertilizer spreader; plant protection product sprayer; chisel plough; disc harrow; watering pivots; winder-type watering machines; scrub shredder; backhoe loader; utility vehicle (UTV) with an automatic soil sampler; and rotor drones and fixed wing (UAV´s).

TP also has in QF several IT equipment and servers, a local weather station, cloud maintenance services and an online software as a service platform.

Most of the area in QF farm is covered by a LoraWan network and gateways, with IoT equipment and field sensors running and communicating on this network.

4. Opportunity which appeared/appears:

TP develop farm activities in QF as a land manager, also works in several R&D projects, with academic and research partners (namely IST-ID), and has consultancy services to assess the environmental footprint, including forest carbon sequestration.

Thus, the opportunity to participate in SILVANUS, with all the partners, and all the knowledge that will be generated in this project, is to contribute for TP to increase the expertise and the knowledge in forest management and sustainable forest grazing techniques for fire prevention and forest restoration.

Also, the use of the SILVANUS integrated platform as a decision support system, based on IoT real time data monitoring, earth observation data, modelling forecasts for fire danger index and vegetation growth, is another important resource that we consider that will be an important exploitable asset for farmers and for technical support.

WHAT AND WHY

5. Exploitable assets and results:

The assets and results (outputs) that have potential to be exploited by TP within the SILVANUS project, are in line with the two product categories that were delineated by the Portuguese Cluster: 1) Forest Fire Prevention IT Tool (FF Tool); and 2) Forest Fire Prevention and Fighting data service – FF Service (FF Service)

1) FF Tool:
    - SILVANUS platform as an integrated tool for decision support (in forest fire prevention, forest fire detection and response, and forest restoration/adaptation strategies).
    - IoT sensors in the field that run in a LoraWan Network (e.g. soil and plant moisture sensors, soil and air temperature sensors, soil electrical conductivity sensors, biomass growth sensors, and GPS animal collars).
    - Fire danger index model and resulting maps, based on remote sensing.

- Vegetation growth/cover models and resulting maps, based on remote sensing.
- Fire detection and early warning instruments.

2) FF Service:
   - Increase forest protection against wildfires.
   - Increase forest resilience/adaptation against wildfires.
   - Increase forest carbon sequestration.
   - Develop "Forest Grazing for Sustainability" models and recommendations.
   - Disseminate scientific "Forest Grazing for Sustainability" results.
   - Deploy "Forest Grazing for Sustainability" as a potential service to be upscaled to other farms/territory.

6. Rationale:

TP is interested in the possibility to use some of the FF Tools and the FF Services that will come out of the Portuguese Cluster exploitation plan, in a way that we expect it will help to implement actions to better protect the forest against wildfires and to prepare for forest restoration/adaptation in case of a wildfire event. By that, also to strengthen TP´s network confidence in forest carbon sequestration services and forest carbon credits trade.

The field data from IoT sensors and remote sensors (Earth observation and UAV's), and the modelling outcomes, will contribute to R&D projects in QF. This acquired expertise, will improve the potential to knowledge transfer for another farms (projects) and services.

The implementation of the forest fire danger index and the vegetation growth models, will contribute to develop TP "Forest Grazing for Sustainability" research (IST-ID), that will improve forest fire prevention and infrastructures protection, also for the Portuguese Cluster partners action (EDP, AdP).

In the future this knowledge could be integrated as a wider farmer consultancy service.

7. Your Value Proposition towards Joint Exploitation of SILVANUS:

TP expects from the project partners:

- to contribute with the scientific knowledge and expertise in fire danger index and forest growth models.
- to develop the SILVANUS integrated platform for prevention, early detection, and forest adaptation to fires.

TP can deliver:

- Earth observation Sentinel 2 data and products (vegetation indexes, cloud cover mask)
- Local weather data station.
- Historical weather data.
- Aerial images orthomosaic processing.
- LoraWan network cover in QF for IoT sensors deployment.
- QF farm as a pilot site for testing forest grazing biomass control, for forest fire prevention and infrastructure protection research.
- Dissemination of SILVANUS product outcomes through TP´s farmer network.

ROADMAP WITH

8. Roadmap: the timeline plan you have for using those assets:

Product	1st sem 2022 (June)	2nd sem 2022 (Dec)	1st sem 2023 (June)	2nd sem 2023 (Dec)	1st sem 2024 (June)	2nd sem 2024 (Dec)	1st sem 2025 (June)	Beyond SILVANUS end
The SILVANUS platform (WP8)								
Citizen engagement toolkit (T3.5)								
Forest landscape models for wildfire threat assessment (T2.3)								
Workshop to discuss forest models with stakeholders (if PT cluster is selected).			x					

Data collection, aggregation and pre-processing of EO (T4.1)								
Collect and process Sentinel2 imagery - vegetation index and clod cover mask.	x	x	x	x	x			
UAVs data processing.			x	x				
Data collection, aggregation and pre-processing of in-situ devices (T4.3)								
IoT sensors deployment and field data collection/processing.			x	x	x			
Fire danger index computational framework (T5.1)								
Data collection for validation (Pilot site) – historical fire events; Land Cover; Topography; Local and regional weather stations data; Weather historical data.		x	x	x				
Large-scale demonstration activities of project outcomes (WP9)								
First open project workshop at Cova da Beira (in the Portuguese demo), involving local and national stakeholders				x				
Second open project workshop at Cova da Beira (in the Portuguese demo), involving local and national stakeholders								x

9. Measurement:

The impact will be measured using the following indicators:

- Number and relevance of stakeholders (municipalities, NGOs, international organizations, farmers, etc.) asking for TP consultancy/advice on the implementation of forest resilience/recovery plans and/or monitoring variables.
- Number and relevance of participants in the workshops for the stakeholders.
- Number and relevance of scientific products (papers, etc.) resulting from research made during SILVANUS.
- Use of SILVANUS platform for QF appliance or research.
- Use of the fire danger index maps for QF appliance or research.
- Use of the forest growth maps for QF appliance or research.

10. Positioning:

N/A

11.2.9 Partner No 12 – 3MON, S.R.O. (3MON)

QUESTIONS

PROFILE AND MOTIVATION

1. Partner profile:

3MON is a Slovak SME focusing mainly on the Firefighting sector for forest fires and saving lives using IT technologies. 3MON is working with two kinds of customers: businesses (B2B) and governmental bodies (B2G). 3MON supplies ground and aerial firefighting equipment, fire ignition products, remote site fuel/water logistics, military fuel/water systems, and mobile shelters. 3MON focuses on coordinating the units on the mission by the firefighter, police, and rescue services department. One of its main products is the GINA System which is a map software technology for computers, tablets and mobile devices. GINA enables its users to navigate through difficult terrain, coordinate teams, and exchange information effectively.

2. Your motivation to participate in the project and commitment:

To enhance and support new technologies for dealing with forest fires in Slovakia and in the world.
• WP 1, Task 1.1 – 3MON will participate in general project coordination activities. • WP 2, Task 2.1,2.5 and 2.6 – 3MO N will contribute to the sustainable forest management services and assessment framework from the viewpoint of Command-and-Control systems and services. • WP 3, Task 4.1-4.4, 4.6 – 3MON will

	take part in data collection and pre-processing, UGVs monitoring of the wildfire, UAVs deployment for remote sensing and data aggregation via the GINA system. • WP 8, Task 8.1-8.5 – 3MON will contribute to the design of the overall architecture, information sharing protocols and interfaces as well as services and overall platform integration. • WP 9, Task 9.1-9.55 – 3MON will participate in all three phase trials (A/B/C) as well as in the cross-cutting trails. It will bring real deployable equipment including UAVs, UGVs (Colossus), tablets deployed in emergency vehicles and GINA installations - central, dispatch, mobile version, tablet version, real-time integration with devices and robots. 3MON will primarily participate in the Slovak trial in close cooperation with TUZVO, UISAV and PLAMEN but also with other SILVANUS project members. • WP10, Task 10.1, 10.2 and 10.5 – 3MON will enact dissemination activities and contribute to self-sustainable models for the CASD and standards and compliance for interoperability of the SILVANUS platform.
	3. Means to achieve your objectives: We are cooperating with FRS in Slovakia for many years, providing and and helping to develop the command support information system of Gina for better support of firefighters on emergency calls. Also we worked with TUZVO and UISAV before Silvanus to support the progress in managing the forest fires in Slovakia. We are offering UAV mapping system to customers, we are offering UGV support for land forces (firefighters, police, military).
	4. Opportunity which appeared/appears: Need of our customers (FRS) is better communication/information system that will enable the firefighters to save time during detection and deployment to forest fires. To integrate UGV and UAV to this system.
WHAT AND WHY	**5. Exploitable assets and results:** UAV, UGV, Gina support command system, portable meteo station, long range optical fire detection system.
	6. Rationale: They are lowering the time for the first responders to get to the forest fire and start the attack. They are providing better information about the scale of the fire from the beginning so there can be appropriate deployment of ground and air forces from the first detection. All these systems are already developed and certified. There could be need for small changes/adaptation when deployed to full operation all together.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: The platform Silvanus, that is the biggest benefits. Even the experience sharing and sharing information from different fields.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** At the moment we have no road map, because a lot is depending on the outcomes of Slovak pilot. After that there will be results that we can build on that.
	9. Measurement: By Slovak pilot and other tests that will be done in the project and outside the project as well.
	10. Positioning: Gina command support system that could be a competition. For the UGV we are offering the most universal and powerful electric robot that is on the marker right now and still can be use indoors and outdoors. For the UAV, we have a system that communicates with Gina command support system, so that is unique.

11.2.10 Partner No 13 - CATALINK LIMITED (CTL)

	QUESTIONS
PROFILE AND MOTIVATION	**11. Partner profile:** Catalink (CTL) Limited is a software development SME founded in 2017, in Nicosia, Cyprus. The company has established a multi-disciplinary team, offering expertise in data science, machine learning, semantic technologies, multimedia analysis, decision making, as well as project management. Catalink engineers deliver cutting-edge solutions for learning and reasoning from incomplete, large and heterogeneous sets of data, delivering solutions for trends prediction, anomaly detection, and situation awareness. Under this umbrella CTL has designed CASPAR, a domain agnostic framework for the automated retrieval & fusion of heterogeneous enterprise data into domain-specific semantic models, to enable the discovery of new knowledge & facilitate the extraction of actionable insights. The company has also cultivated broad expertise in computer vision, image processing and multimedia applications, such as human activity recognition, driver monitoring, fleet management and traffic management from wearable and surveillance cameras (CCTV), as well as semantic segmentation for crisis event detection in visual content based on content-based image retrieval and dynamic texture recognition. Under this concept, CTL has developed a smartphone application, named IRIS for the continuous monitoring of the state of a driver during the whole duration of a driving session. The application detects the face of the driver, extracts the facial landmarks and estimates the drowsiness of the driver based on how long the eyes are kept closed and the frequency of yawning, raising an alarm when necessary. Catalink places emphasis on its R&D activities, rendering them the foundation of its service and product portfolio. Its members have strong experience in successfully carrying out research in ICT at both national and international level. Catalink has established synergies with several stakeholders from industry and academia, which guarantees its ability to always deliver novel, cutting-edge and high-quality research activities.
	12. Your motivation to participate in the project and commitment: Catalink's motivation to participate in SILVANUS project is to design and develop highly customable software for stakeholders that want to fight forest fires with the use of Artificial Intelligence (AI) and semantic reasoning. For that purposes Catalink targets at contributing to SILVANUS with cutting edge AI tools, as well as IoT devices and semantic reasoning. AI tools will deal with the early detection of fire forest with the detection of fire and smoke particles within images and videos taken from CCTV cameras, social media and UAVs. A Raspberry PI will be used as a gateway to enable the communication between the edge devices and cloud. Last but not least, a semantic reasoning framework will be provided to the partners so that the platform may connect all pieces together and make sophisticated decisions by leveraging semantic reasoning.
	13. Means to achieve your objectives: Catalink Ltd possess all the necessary resources in order to achieve the aforementioned activities. More specifically, the company is located in a modern building in Nicosia, fully renovated so that it can satisfy CTL activities; namely 2 servers for storage and communications purposes; 1 cluster of GPUs to deploy the aforementioned services and products; several laptops and personal computers. The company has also secured several governmental and private capitalist schemes that facilitate the functioning of the company, followed by a carefully designed well-balanced cost structure. As far as the personnel is concerned, CTL employees highly experienced management leaders, experienced software engineers, and boasts that is sustains a satisfactory communication channel with target customers.

	14. Opportunity which appeared/appears: Our participation **is SILVANUS** is the result of the real need of Cypriot and Greek customers (for industrial partners), such as policy makers, firefighters, public authorities and companies that develop AI and ICT tools to help them deal with the raising problem of detecting and extinguishing fires in these areas. **Market growth** in the development of AI tools that detect new fire events and notify the respective people to extinguish them is significantly increasing, creating favorable prospects for profit. Furthermore, the competition in fire detection market is quite low, as the problem has recently raised so much attention and there are not so many companies that develop this kind of technologies so intensively. Contrary to previous decades, the legal and political environment is quite healthier in both local and international markets, allowing data acquisition and manipulation in remoted forest areas. Last but not least, there are a lot of indications that the positive trend that raised the last year in the market will continue next years and promises a prosperous future for companies that want to delve more into fire detection AI tools, that leverage IoT technologies and semantic reasoning frameworks.
WHAT AND WHY	**15. Exploitable assets and results:** Catalink Ltd aspires to develop a great dealt of AI tools and IoT devices that will be used to detect and spot the ignition of fires in wild forests. The company will be able not only to leverage the AI tools as a set of services for detecting and spotting fire forest but will also be able to exploit them individually by selling it in ICT companies to merge them as an ad-hoc asset. Catalink also aspires to leverage the semantic reasoning framework that will be used to fuse all information together and extract semantic knowledge out of multiple sources. Last but not least, an IoT device will be encapsulated in a portable kit that could seamlessly deployed in desired areas.
	16. Rationale: We are interested on developing AI, IoT and semantic reasoning assets, with specific attention on the development of the portable kit that will contain a lightweight version of the AI tools, not only in order to get profit from them but also to help modern societies and puclic authorities to deal with the alarming raising of fire events worldwide. Most of the aforementioned assets will be exploited industrially by selling them individually in companies that also work on this domain or by merchandizing the IoT kit.
	17. Your Value Proposition towards Joint Exploitation of SILVANUS: **CTL** expects to collaborate with several industrial partners from SILVANUS project, such as DELL and INTRA, in order to encapsulate the edge fire detection component in lightweight and portable kit and merchandize it with its customers in Cyprus and Greece. There is also the possibility to form a joint spinoff with other SILVANUS partners after the end of the project and leverage a potential asset that might have been developed by more than one partners. Potential collaboration with universities might also be considered so that the company may exchange knowledge with domain experts and further advance the aforementioned assets.
ROADMAP WITH TIMELINE	**18. Roadmap: the timeline plan you have for using those assets:** The roadmap will include the final development of the exploitable assets, validation testing, updates to the prototype based on the outcomes from the validation test, and finally marketing and sales within the initially targeted markets. **CTL** plans to release the aforementioned exploitable assets mainly in Greek and Cypriot public authorities, first responders and ICT companies that develop similar technology. We plan to meet with the target stakeholders as soon as we have a Minimum Value Product (MVP), possibly due on M30 of Silvanus project. Demonstration and update cycles are expected to follow before proceeding with the first agreement with any of the target stakeholders. Further investigation of international target stakeholders will follow in order to upscale clientele.

	19. Measurement: The impact of the planned actions will be measured the last year of the project by setting up appropriate Impact indicators including: i) The size of the stakeholders that we have approached and demonstrated our exploitable assets (at least 10 users); ii) The number of Products, Processes and Methods that will follow the introduction of our exploitable assets; iii) The start-ups and/or spin-offs that have been jointly created with other SILVANUS partners and are expected to be commercialized after the end of the project; iv) the consultations that have followed the release of CTL's exploitable technologies, modules and platforms and provided to interested parties.
	20. Positioning: Currently, there is no competition in Greece and Cyprus that provides ready-to-install solutions to detect fire incidents in forests.

11.2.11 Partner No 15 - EXPERT.AI S.P.A. (EAI)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** Expert.ai is a market leader in artificial intelligence (or 'AI') technologies applied to the understanding and language understanding and processing (Natural Language Understanding, Natural Language Processing - NLU/NLP). The company, founded in Modena in 1989 (under the name Expert System), has around 360 professionals with solid technical and business skills, dedicated research laboratories and a significant international presence. The Group, in fact, operates in two continents, with branches and offices in Italy (Modena, Rovereto, Milan, Siena, Rome and Naples), the United Kingdom (London), Switzerland (Geneva), Germany (Frankfurt), Spain (Barcelona, Madrid), France (Paris), the USA (Boston, Rockville, Alexandria) and Canada (Montréal).
	2. Your motivation to participate in the project and commitment: Expert.ai has developed cutting-edge natural language understanding technology that uses semantic analysis to help machines understand texts by resolving ambiguities in language. With this technology, we support organisations in creating artificial intelligence solutions that provide immediate results, ensuring the highest accuracy in linguistic analysis and allowing experts to spend more time on strategic activities that require human intervention. Thanks to Silvanus, we have the opportunity to develop a new domain of knowledge to improve the performance of NLP and, potentially, to propose ourselves in new markets, which to date have not been covered.
	3. Means to achieve your objectives: The Expert.ai Platform is a simple and integrated artificial intelligence platform for natural language, which is characterised by its hybrid approach, i.e. its unique ability to combine the advantages of machine learning and human-like symbolic knowledge to understand the meaning of texts, with great speed and at large scale. Designed specifically to transform language into valuable data, our hybrid natural language platform makes it easier, faster and cheaper to design, implement and deploy effective and powerful AI solutions for text analysis. The reasons behind the acceleration of AI applied to language are mainly threefold: the steady and exponential increase of unstructured data (according to IDC projections, 80 per cent of the world's data

	will be unstructured by 2025); organisations' perception of automatic understanding of business documents as a strategic asset for accelerating digital transformation, process automation and for all more complex decision-making activities; and increasingly powerful, scalable and accessible computational capabilities.
	4. Opportunity which appeared/appears: On the technological front, a greater awareness is beginning to emerge on the part of companies of the limitations of AI systems based exclusively on statistical approaches and, conversely, of the advantages offered by hybrid AI or composite AI, i.e. an approach geared towards combining different artificial intelligence technologies (knowledge graph, semantics, machine learning and/or deep learning). According to Gartner, companies often equate artificial intelligence and machine learning, limiting the implementation of business use cases to cases where this approach works well. Composite AI (or Hybrid AI), on the other hand, goes beyond machine learning, combining different techniques to improve the versatility and efficiency of artificial intelligence and successfully tackle more business problems. The opportunity that appears for EAI in the SILVANUS project is the close communication with end-user partners who can also be potential customers.
WHAT AND WHY	**5. Exploitable assets and results:** ● Domain knowledge and customization of NLU solutions are determined to make these solutions applicable in the real world. Especially in domains as critical as those faced by Silvanus. Thanks to the development of the software and the in-house knowledge of the EXPAI team, it will be possible to tackle new projects in this area, both nationally and internationally. In particular, in the case of the social sensing component, the possibility of analysing plan text in order to indentify events, causes and information related to the event itself.
	6. Rationale: The market for homeland security, risk prevention, etc., is a niche where AI can bring added value and EXPAI intends to tackle it with more determination in the future
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: EXPAI's NLP technology is a tool that can be useful in various contexts and various stages of the work processes that the partners manage on a daily basis, so we hope to activate opportunities in various areas, thanks also to the mutual knowledge gained during the project. Regarding the social sensing component, other SILVANUS partners are going to contribute with the integration of the solution into the SILVANUS system as well as with the visualization of the collected and analyzed social media data.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** ● **Fire detection based on social sensing asset:** The first phase of the development will be until M18, when the demo presentation of the Social Sensing user product (UP3) will take place. The second phase of the development, which will be significantly based on the feedback of the end users, will last till the end of the task (M36). After the end of the project, a presentation of the final product will be available on M4D's website. Furthermore, there will be general promotional activities through the lab's communication channels, such as blogspots and Twitter, and participation in events like tech expos. EXPAI will promote the project at every possible opportunity, starting with meetings and conferences with themes close to those of Silvanus. It also participates in the promotion of social accoutrements by relaunching posts through its web and social network channels

	9. Measurement: To measure the impact of the social sensing component, we will employ analytics, such as website clicks and post views, as well as tracking the number of interested customers.
	10. Positioning: The Social Sensing component, in contrast to its competitors, is dedicated to fire-related posts only, involves AI techniques to extract further knowledge from the original social media data, and finally does not rely on the limited geoniformation provided by Twitter, but employs automatic geotagging. In addition, the hybrid AI solution proposed by EXPAI is unique in that it is based on a logic-symbolic approach, with linguistic rules, instead of the more popular contemporary approach to Deep Learning AI, which many are proposing on the market.

11.2.12 Partner No 16 - ITTI SP ZOO (ITTI)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** ITTI is a SME from IT sector providing innovative applications and dedicated software solutions. ITTI operates since 1996 and is located in Poznan, Poland. The company offers its services to space sector (mainly to European Space Agency), as well as to private and public entities in Poland. Since 2001 ITTI has been actively involved in the R&D projects performed in the EC programmes (recently Horizon Europe programme). The company contributed also European Defence Agency R&D programmes (e.g. Joint Investment Programme on Force Protection, Joint Investment Programme on CBRN) and national research programmes. In R&D activities the company cooperates closely with numerous universities and research institutes based in Poland as well as around Europe. ITTI is an institutional member of the Public Safety Communication Europe Forum and Integrated Mission Group for Security (IMG-S). ITTI is also one of the co-founders of Polish Space Industry Association. In the recent years ITTI was several times awarded with the prestigious “Cristal Brussels Prize” for being the most active and successful Polish company participating in EC FP programmes.
	2. Your motivation to participate in the project and commitment: The main motivation is to get the necessary experience and know-how, as well as first-hand knowledge of specific FR / PPDR operations regarding wildfires handling, and thus get the ‘foot’ in the door in providing tailored software solutions for firefighters, possibly with the cooperation with other SILVANUS entities.
	3. Means to achieve your objectives: The team working on SILVANUS project has experience working on both commercial and R&D projects. The team engaged has appropriate skill set (programming, UI / UX design, user needs analysis, etc.) to carry out the necessary tasks to complete the SILVANUS common UI.
	4. Opportunity which appeared/appears: The main motivation is to get the necessary experience and know-how, as well as first-hand knowledge of specific FR / PPDR operations regarding wildfires handling, and thus get the ‘foot’ in the door in providing tailored software solutions for firefighters, possibly with the cooperation with other SILVANUS entities.

WHAT AND WHY	**5. Exploitable assets and results:** Knowledge on UX / UI design for crisis management, building team skills to develop software tailored to handling wildfire crisis situations; potential opportunity to exploit in-house tools for gathering user feedback during pilot phase.
	6. Rationale: As mentioned in point 2, the main motivation is to get the necessary experience and know-how, as well as first-hand knowledge of specific FR / PPDR operations regarding wildfires handling, and thus get the 'foot' in the door in providing tailored software solutions for firefighters, possibly with the cooperation with other SILVANUS entities.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: ITTI can support other partners in designing UI / UX to leverage and exploit their tools by end-users.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** Highly depends on the pilots' feedback, to be defined at a later stage.
	9. Measurement: Measuring KPIs agreed with WP9 and WP10 related to the UI / UX.
	10. Positioning: The value of the common SILVANUS dashboard / UI depends highly on the value provided by specific SILVANUS tools.

11.2.13 Partner No 17 - IZQUIERDO/PIATRIK GBR (VMG)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** Venaka Treleaf Limited (VTG) is a SME specializing in the development and provision of software and hardware for ecological applications. In particular, the objective of the company is to develop computer vision-based services for the promotion of social and ecological awareness, forest protection and reforestation support. By exploiting modern software and hardware technologies together with open middleware platforms, VTG engineers have successfully delivered several commercial applications and platforms that fulfil projects and customers' requirements. VTG technology is a result of extensive R&D activities performed in cooperation with well-known academic research teams. The product-oriented core competencies of VTG include expertise in developing applications across several platforms including desktop solutions, mobile applications along with complementary technologies that support front-end system design.
	2. Your motivation to participate in the project and commitment: In Silvanus project, VTG's main activities focus on technical coordination and development of the FIPAS mobile application for fire prevention and awareness support.
	3. Means to achieve your objectives:

	The team members of VTG have collectively more than 30 years of experience in identifying problems and engineering optimal solutions. VTG personnel brings extensive research background and track record acquired through participation in EU funded project, as well as, long standing co-operations with renowned industrial players.
	4. Opportunity which appeared/appears: The VTG market is represented by a large number of corporate partnerships established with leading organisations in environment sector. The target market for VTG is represented by a large-number of public and private service providers aimed at offering ecological applications. The technological support extended by VTG to its corporate partners brings value added technology support for shifting through large volume of data archives.
WHAT AND WHY	**5. Exploitable assets and results:** FIPAS - fire prevention and awareness support Mobile application. The application supports citizen engagement through the gathering of biodiversity and location data for fire prevention and ecological awareness.
	6. Rationale: A socio-economic activity related to the protection of the environment is at the heart of the company. Specifically, the company is run as a social enterprise for the production of technical means to support environmental protection.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: VTG greatly benefits from cooperation with Silvanus partners through exchange of the knowledge and expertise in fire prevention and biodiversity evaluation. FIPA application will deliver an effective solution for Silvanus project to gather and analyse the large amount of biodiversity data derived from the type of trees in the forest and its relation to fire spread and fire prevention.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** M22 Meeting with the board to finalise the plan for the commercial execution of the FIPAS application M23 Updated exploitation plan for FIPAS application M24-M28 Meetings with stakeholders and potential business partners M26-M30 Development of final features of the FIPAS application to support its commercial release M32 Release of the FIPAS commercial version
	9. Measurement: - The amount of the data collected through the application. - The accuracy of the tree recognition
	10. Positioning: To the best of our knowledge and our current market research, there is no mobile application on the market to support the fire prevention based on biodiversity data from forests, supporting the vast collection of biodiversity data by its users.

11.2.14 Partner No 18 - MASSIVE DYNAMIC SWEDEN AB (MDS)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** Massive Dynamic Sweden AB is a Swedish creative SME that innovates in research and development of technology solutions in different sectors. MDS has been operating in Sweden the last years and has been focusing on the following areas: the development of educational and e-learning software with special emphasis on: a. scenario-based learning, storyboarding and chatbots. b. data collection and analysis using sensors for chronic medical conditions. c. vr training solution for first responders.
	2. Your motivation to participate in the project and commitment: MDS is leading the development of a mobile application for citizen engagement in forest education as well fire management. The team of MDS is responsible to gather information regarding citizen awareness for forest and fire management analyze it and develop a mobile application for raising the awareness level of citizens.
	3. Means to achieve your objectives: MDS engineers have the expertise in information gathering as well as mobile development. They have also research experience in measuring awareness levels of users in several domains and create awareness models for better understanding and management of different conditions.
	4. Opportunity which appeared/appears: Through SILVANUS project we aim to expand our development capacity and network in awareness-based applications. Our goal is to understand the needs for raising the awareness level of citizens as well as to include, integrate and analyze data from different sources in order to inform and educate the users through mobile applications.
WHAT AND WHY	**5. Exploitable assets and results:** A: Mobile Application B: Data Integration C: Awareness program D: Location Based Information
	6. Rationale: MDS is interested to exploit the results of this project in different domains where the awareness level of the users is a critical aspect in decision making. MDS has already established collaborations in the field of cybersecurity and privacy, aiming to explore the awareness level of the users in different organizations and provide a method to increase it. Through SIVLANUS project, MDS aims to explore collaborations with large scale organizations, municipalities and communities and test the developed mobile application in different locations around the world.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: One of the main goals of MDS team is to understand the needs of the pilot partners in forest and fire management. Moreover, the team is responsible to collaborate with the data/information provider

	partners and create a holistic mobile backbone for citizen engagement in forest and fire management as well to integrate and transform this data to mobile friendly and location-based concept.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** The first iteration of the Citizen Engagement Mobile Application will be delivered at M18 as per the DoA with an MVP presented at the General Assembly on M15. The first iteration will include three functional modules (content visualization module, notification system, user management module) and will be open for beta testing by the validation partners and the involved pilots. By the end of the project, we plan to release a fully functional mobile app with an independent backend system, localized content and microservices that will connect the app with the rest of the relevant modules of the SILVANUS Project. After the project, by having a robust backend infrastructure and a model frontend we plan to approach more pilot scenarios and enrich the application further with extra modules relevant to those scenarios.
	9. Measurement: As with most mobile applications, we plan to measure specific KPIs such as: • The number of active users • User retention • User satisfaction (reviews and surveys in regards with the UI/UX, the relevancy of the content provided, the responsiveness etc) Also, as the app is a part of the Citizen Engagement Program, we will use its resources and developed methodologies to measure the impact at the end of the project.
	10. Positioning: Currently there are not any holistic, multi-localized applications providing both information on fire prevention and fire detection on the market. Our novel approach could create a state-of-the-art, globally relevant, multi-purposed, educational and informative platform for citizens and professionals.

11.2.15 Partner No 19 - FONDAZIONE CENTRO EURO-MEDITERRANEOSUI CAMBIAMENTI CLIMATICI (CMCC F)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** The Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (Fondazione CMCC) is a non-profit research institution. CMCC's mission is to investigate and model our climate system and its interactions with society to provide reliable, rigorous, and timely scientific results, which will in turn stimulate sustainable growth, protect the environment, and develop science driven adaptation and mitigation policies in a changing climate. CMCC collaborates with experienced scientists, economists, and technicians, which work together in order to provide full analyses of climate impacts on various systems such as agriculture, ecosystems, coasts, water resources, health, and economics. CMCC also supports policymakers in setting and assessing costs, mitigation, and adaptation policies. CMCC benefits from the extensive applied research experience of its members and institutional partners: Istituto Nazionale di Geofisica e Vulcanologia (INGV); Università del Salento; Centro Italiano di Ricerche Aerospaziali (CIRA S.c.p.a.) Università Ca' Foscari Venezia; Università di Sassari; Università della Tuscia; Università di Bologna; Politecnico di Milano; Resources for the Future.

CMCC research activities are distributed among nine research divisions that share different knowledge and skills in the field of climate science: Advanced Scientific Computing (ASC) Division; Climate Simulation and Prediction (CSP) Division; Economic analysis of Climate Impacts and Policy (ECIP) Division; Impacts on Agriculture, Forests, and Ecosystem Services (IAFES) Division; Ocean modelling and Data Assimilation (ODA) Division; Ocean Predictions and Applications (OPA) Division; Risk Assessment and Adaptation Strategies (RAAS) Division; Regional Models and geo-Hydrological Impacts (REHMI) Division; Sustainable Earth Modeling and Economics (SEME) Division; Information Systems for Climate science and Decision-Making (ISCD); Innovative Platforms for Science Outreach (IPSO).
CMCC acquired portfolio of research projects includes more than 428 primary internationally composed and funded projects: 37 funded projects in FP6 and FP7 (6th and 7th Framework Program of the EU), 81 funded projects in H2020 (Horizon 2020 Programme of the EU) and 310 funded projects under other EU and international research grants. The 2020 annual turnover is equal to 16,4 mil. Euro and 123 permanent staff have been working at CMCC.

2. Your motivation to participate in the project and commitment:

Motivation to join:
The SILVANUS project represents a chance for Fondazione CMCC to improve its competencies and offer services in the field of weather and climate data for environmental emergencies, especially wildfires. The participation in an EC project, with large number of participants, will allow to the Fondazione CMCC employees to enlarge its cooperation at European level positioning itself as a reliable partner for future R&D projects in the area of weather and climate services applied to several sectors that are crucial for the well-being of people and the environment such as energy, food, agriculture, tourism, blue economy, health, education, real-estate, and many others.

Role in the project:

• WP1: CMCC will contribute to the overall project management and will participate in the general assembly meetings organised by administrator and scientific coordinator (PEG/Z&P).
• WP2: CMCC will lead the activity on climate sensitive forest models
• WP4: CMCC will coordinate the work package activities and will lead the development of predictive climate conditions and process weather data obtained from EO repository
• WP5: CMCC will contribute to the big-data framework, semantic information fusion and real time response coordination.
• WP8: CMCC will actively participate in the integration activities of the project resulting from WP2, WP4 and WP5.
• WP9: CMCC will collaborate with Italian pilots organised by ASSET and PNRT in demonstrating Phase A, B and C scenarios.
• WP10: CMCC will actively exploit the project outcomes in strengthening their internal knowledge competencies.

3. Means to achieve your objectives:

Fondazione CMCC will utilise a number of its resources to implement this project. These means can be detailed as following:

1. CMCC Divisions involved in the project:

- Advanced Scientific Computing ASC:
  Division carries out R&D activities on Computational Science applied to the Climate Change domain. In particular, it focuses on the development of advanced computing techniques and innovative algorithms for an optimal exploitation of numerical models on HPC architectures (High End Computing – HEC) and other relevant activities.

- Climate Simulation and Prediction CSP:
  The CSP Division contributes to the development of the CMCC climate and earth system models, and uses them to explore and improve our understanding of the mechanisms underpinning climate variability, climate predictability and climate change, by means of numerical simulations.

- Impact on Agricultural, Forests, Forests, and Ecosystem Services IAFES:

The IAFES Division is organised around two poles located in Sassari and Viterbo with integrated and complementary competencies. The main goal of the research, consultancy and service activities of the IAFES Division is analysing the interactions between climate change and terrestrial – natural and semi-natural – ecosystems and anthropic sectors.

- Regional Models and geo-Hydrological Impacts REMHI:
  The main activities of REMHI Division include studies about: regionalization of the climatic signal through the development and use of statistical and dynamical downscaling approaches, and qualitative evaluation of the effects of climate changes and anthropogenic pressure on the geo hydrological hazards (such as landslides, floods, and droughts).

2. Scientific Background:

CMCC team involved in SILVANUS project has the proper relevant scientific background consisting of the participation in a number of publications and scientific papers as following:

- M. Mirto, A. Mariello, A. Nuzzo, M. Mancini, A. Raolil, O. Marra, S. Fiore, C. Sirca, M. Salis, V. Bacciu,^, D. Spano, G. Aloisio, (2015) "The OFIDIA Fire Danger Rating System" Proceedings of 10th International Conference on P2P, PARALLEL, GRID, CLOUD and INTERNET COMPUTING, November 4-6, 2015, Krakow, Poland.
- M. Mirto, M. Mancini, A. Mariello, A. Raolil, O. Marra, C. Sirca, M. Salis, D. Spano, A. Bartzokas, S. Anastasiadis, S. Fiore, G. Aloisio (2015). "The OFIDIA Project: an operational fire 142101037247 – SILVANUS – Part B danger prevention platform". Second International Conference on Fire Behaviour and Risk, Alghero, Sardinia, May 26-29, 2015.
- Manzi M.P., Zollo A.L., Mercogliano P. and Galdi C. (2015) "Aviation weather awareness: development of algorithms for the detection of weather hazard through the use of EUMETSAT products" - Proceedings of 2nd IEEE International Workshop on Metrology for Aerospace, Benevento, Italy, June 3-5 2015, pp 466-471, IEEE Catalogue Number: CFP1532W-ART , ISBN: 978-1-4799-7569-3 DOI: 10.1109/MetroAeroSpace.2015.7180702.
- Zollo A.L., Manzi M.P., Mercogliano P. and Galdi C. (2015) "Precipitation nowcasting using the satellite product Multi-Sensor Precipitation Estimate"- Proceedings of 2nd IEEE International Workshop on Metrology for Aerospace, Benevento, Italy, June 3-5 2015, pp 460-465, IEEE Catalogue Number: CFP1532W-ART , ISBN: 978-1-4799-7569-3 DOI: 10.1109/MetroAeroSpace.2015.7180701.
- Collalti, A., Trotta, C., Keenan, T. F., Ibrom, A., Bond-Lamberty, B., Grote, R., et al. (2018). "Thinning can reduce losses in carbon use efficiency and carbon stocks in managed forests under warmer climate". Journal of Advances in Modeling Earth Systems, 10.https://doi.org/10.1002/2018MS001275.

3. CMCC Service Assets:

The following are two main service assets that will be used during the implementation of Silvanus project:

- CMCC Data Delivery System (DDS) (https://dds.cmcc.it) provides a unique access point for data produced and used by CMCC. The DDS consists of two main components: 1) a web portal that allows users to browse the Catalog and to build dataset queries 2) a Python client that provides a simple API to programmatically query, access and analyse data (https://pypi.org/project/ddsapi, https://anaconda.org/Fondazione-CMCC/ddsapi).
- DATACLIME value-driven climate service developed in a GIS environment, with the main goal to manage climate data, link climate and impact studies and assist a wide users' range. www.dataclime.com.

4. CMCC Relevant Previous Projects and Activities:

CMCC implemented many relevant projects and these projects contribute directly and indirectly to the implementation of the SILVANUS project.

- OFIDIA2 Interreg Italy-Greece https://www.interregofidia.eu
- OFIDIA's main objective is to build across-border operational fire danger prevention infrastructure that advances the ability of regional stakeholders across Apulia and Ioannina Regions to detect and

fight forest wildfires through more effective patrolling, environmental monitoring, weather modelling, fire danger forecasting and automated access to related historical data.

- CRESCENDO – Coordinated Research in Earth Systems and Climate: Experiments, kNowledge, Dissemination and Outreach https://www.crescendopro-ject.eu/
- CRESCENDO project brings together 7 European Earth System Modelling (ESM) teams and 3 European Integrated Assessment Modelling groups to improve the process realism and future climate projection reliability of ESMs, to investigate the changes in the fully coupled system considering both past and future development pathways of anthropo-genic greenhouse gas emissions and Forest model validation con- ducted under CRESCENDO will allow starting from robust parameterization for model application to different ecosystems (e.g. deciduous, evergreen). 143101037247 – SILVANUS – Part B land use change. A significant effort has been put also in the improvement of physical and biochemical processes (including forests) to develop the next generation ESMs and the necessary tools to evaluate their performance quality and projections reliability.
- CLIMATE KIC-Wat-ener-cast https://www.climate-kic.org/projects/wat-ener-cast/)
- Wat-Ener-Cast (WEC), develops activities to avoid penalties and leverage opportunity to water and energy actors through the use of high-quality weather forecasts tailored to their operational needs. What-Ener-Cast could represent a real concrete value in terms of optimization of their operation and reduction of risks. Wat-Ener Cast will fill this gap by providing these actors with easy access to high quality forecasts (predictions and scenarios) suited in risk assessment dashboards for operational decisions..
- Copernicus C3S_430 - Copernicus Sectoral Information System for Disaster Risk Reduction Pluvial Flood Risk Assessment in Urban Areas https://climate.copernicus.eu/pluvial-flood-risk-assessment-ur-ban-areas
- CMCC has been contracted by ECMWF to develop a climate change service to support Disaster Risk Reduction (DRR) in Europe. The service exploits Copernicus C3S data and generates knowledge required for assessing risks from extreme weather and climate related events.
- ARTACLIM 2 (Funded by Politecnico Torino)
- The aim of the project was to provide to local authorities the appropriate tools to introduce adaptation measures and actions in the planning processes in order to increase the resilience of their territories.

5. Infrastructure Assets:

- CMCC Supercomputing centre:
- Since 2008, CMCC has operated its own Supercomputing Centre (SCC) located within the University of Salento Campus in Lecce. The CMCC Supercomputing Center is the only computational facility in Italy specialising in Climate Change research (https://www.cmcc.it/super-computing-center-scc). Zeus, the supercomputer currently in operation, is based on 348 Lenovo SD530 bi processor nodes (for a total of 12.528 cores) all interconnected by means of an Infiniband EDR network. The HPC system has a computing power (theoretical peak performance) of 1.202 TFlops.
- CMCC Supercomputing Centre in Lecce HQ:
- During 2021, CMCC will build its new supercomputing centre at the new CMCC headquarters in Lecce. This new project also includes the upgrading of the computing and storage facilities. In particular, CMCC plans to have its new HPC facility (named Juno) in production starting from the end of the first quarter of 2022. The new supercomputer Juno will have a computing power (theoretical peak performance) of about 1.134 TFlops and will be based on the new Intel processors generation just announced this month (3rd Generation Intel Xeon Scalable codenamed “IceLake”) and also on the latest generation of NVIDIA GPU (NVIDIA Ampere architecture). In order to manage and preserve for medium/long term the huge quantity of climate data produced by the research and operational activities at CMCC, in 2019 a new archiving system has been deployed. The hardware components of this new system are: IBM TS4500 tape library with nr 6 LTO8 drives and 2 accessors, 5PBytes of capacity; Nr 2 servers Lenovo ThinkSystem SR630; Nr 1 IBM DS2200 FC storage system; 16Gbps FC SAN implemented with nr 2 Lenovo FC switches B6505. IBM Spectrum

	Archive Enterprise Edition is the software that manages the tape library operations and stores the data on the tape tier in the Linear Tape File System (LTFS) format.
	4. Opportunity which appeared/appears: The SILVANUS project is in line with other projects of CMCC like OFIDIA Interreg Italy-Greece https://www.interregofidia.eu for wildfire prevention and management.
WHAT AND WHY	**5. Exploitable assets and results:** **1. Tools/Service: Fire Danger Risk Assessment Tool** CMCC will build in SILVANUS a service (The "Fire Danger Risk Assessment Tool'') for estimating the fire risk based on data-driven approaches that will exploit heterogeneous data sources (Earth Observation, Weather/Climate Data). The tool will provide an indication of the fire danger risk for an area of interest on a certain forecasting period (for the next hours, days, months/seasons). Fire danger is a broad scale assessment of the conditions that reflect the potential, over an area, for a fire to ignite, spread and require suppression action. It is the sum of the factors affecting the initiation, spread, and resistance to control the fire in a given area. It is typically expressed as a semi-quantitative index (e.g., from very high to very low). This tool mainly contributes to SILVANUS Phase A providing information about the conditions that reflect the potential over an area for a fire to ignite and spread. It contributes also to Phase B since it provides information where the fire is most probable to ignite and spread so it can be used as input for improving early detection of wildfire (e.g., increasing the monitor frequency by the sensors, planning drone missions to monitor areas with high fire risk). **2. Tools/Methodology: Climate-Driven Forest Model** CMCC will conduct multi-model experiments under ensemble of climate forcing and forest ecosystem models, also including management options, so to derive information on those conditions that, combined with probability of fire occurrence, will allow estimating not only likely impact of climate on forests through fires, but also effects of forest fires on climate due to GHG emissions from burned vegetation.
	6. Rationale: The Fire Danger Risk Assessment Tool will be based on automated data analysis and processing of heterogeneous data sources coming from European Copernicus Service and CMCC weather/climate modes. New data-driven approaches (ML/DL) will be implemented to provide better performance/skills in providing risk maps for different temporal horizons, going from nowcasting (next few hours) to seasonal (summer risk map). Exploitation would follow the academic channel to produce research papers and participation in conferences, but also provide a new service for fire danger risk integrated within CMCC facilities. Climate Driven Forest Model, CMCC exploitation will be related to research publications and participation in scientific conferences.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: Fondazione CMCC believes in collaboration in the scientific field and the SILVANUS project is no different in a sense that CMCC expects the utmost levels of integration, cooperation, and sharing of knowledge, expertise, and assets. Each partner in this project represents a valuable added value that is needed to deliver the project deliverables and achieve the impact needed. Similarly, CMCC will contribute with its team of experienced scientists, assets, and wide knowledge in the field of climate driven forest model, weather data, and data analytics in fire danger prevention. CMCC shall put forward its tangible and

	intangible resources and make it available to all SILVANUS partners to help in achieving the project impact. CMCC is certain that all the partners in the project share the same vision and culture of endless cooperation which is one of the main pillars that will make the SILVANUS project a value-added one.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** N/A
	9. Measurement: Using the project's KPIs and the tools mentioned in the D2.3 – Report on SILVANUS formal assessment methodology, in particular table 15 and 23 within the document.
	10. Positioning: N/A

11.2.16 Partner No 20 - EXUS SOFTWARE MONOPROSOPI ETAIRIA PERIORISMENIS EVTHINIS (EXUS)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** EXUS was founded with the vision to transform the costly and complex enterprise software industry – making it simple, accessible and exciting. EXUS AI Labs is the applied research arm of EXUS Software, a global leader in the design, creation and marketing of enterprise software solutions and services, managing a portfolio of initiatives that aim to pave the way for the introduction and uptake of emerging technologies. Leveraging the results of strategic research activities allows us to harness untapped niches in our market sectors of interest. EXUS AI Labs brings together professionals of diverse research backgrounds, including algorithms, architecture, data management, machine learning & AI, privacy and security, user interfaces, and visualization. Our vision is to transform research to successful market products enhanced with intelligent services that are built upon novel data analytics algorithms, mechanisms and tools that are reusable and scalable across multiple application domains.
	2. Your motivation to participate in the project and commitment: EXUS' AI Labs is a key partner that can actively contribute to the definition of new research and innovation opportunities harnessing the potential of Data. Within SILVANUS, EXUS contributes to the curation of content for firefighter training purposes, supports in developing the big data framework and data driven services for real-time monitoring of response coordination, and leads the development of a model predicting fire spread.
	3. Means to achieve your objectives: EXUS' AI Labs is the research & development department of EXUS, supporting the implementation of numerous R&D projects. The team leading the work on the implementation of SILVANUS consists of a project manager, an operations manager, an AI solutions architect, and a team of software and data engineers.
	4. Opportunity which appeared/appears: EXUS participation in SILANUS project aligns with its mid-term strategy for the creation of solutions based on AI/ML/DF solutions. This involvement will support EXUS on gaining valuable knowledge and developing

	a strong background in such solutions, which will in turn be incorporated in its commercial activities "EXUS Financial Suite" (EFS).
WHAT AND WHY	**5. Exploitable assets and results:** EXUS' software components are separated in the following subcomponents • A scenario building tool, designed to formulate structured scenarios to be used for the training of firefighters • A fire spread model, capable of predicting the future location of the fire front given several input parameters, such as predominant wind and weather conditions, terrain, specific forest vegetation parameters, etc.
	6. Rationale: We develop components based on artificial intelligence/ machine learning/ data fusion solutions, which contribute to building in-house expertise in these fields. This, in turn, will be exploited in EXUS' commercial product, to offer a complete data analytics solution to the broader banking sector.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: Through SILVANUS, EXUS expects to solidify our position as a key technology provider, particularly relating to topics aligned with the European Green Deal and focusing on the areas of prevention/preparation, crisis management and forest restoration as applied to forest fires. We deliver high-quality components enhancing the situational awareness of firefighting services.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** EXUS is already deploying the first prototypes including Artificial Intelligence and Machine Learning aspects in our flagship product: EFS. Therefore, as components are developed within SILVANUS, the knowledge gained is transferred into appropriate solutions for our commercial product.
	9. Measurement: The number of AI features released within EFS.
	10. Positioning: EXUS is targeting financial institutions with different TIERs and energy providers, providing a debt-collection solution. Our offering is a full deployment of our suite with some customization to fit any "special" need and we are approaching them with the "self-service" feature, which is a new trend that most competitors do not provide. Furthermore, Artificial Intelligence is a strategic sector of high importance for our company, thus any outcomes from the solutions that can be generalized (via a set of adaptations) can be offered as a marketable product enlarging our bouquet of offered AI services contributing to the financial sustainability of the company. We face competition from different sources, such as: [Large international vendors] who provide collection systems among their other product offerings, [Local vendors] who provide customized collections solutions to our target customers, [In-house solutions] usually developed and supported by the IT of the organizations.

11.2.17 Partner No 21 - RINIGARD DOO ZA USLUGE (RINI)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** **RiniGARD (RINI)** is a Zagreb based SME, established in 2019, specialized in providing communications security and ICT solutions for smart health, critical infrastructure, and security applications.
	2. Your motivation to participate in the project and commitment: There are several reasons why RINI joined SILVANUS project: - The project allows us to optimize our solution for new market segment of Forest Fires - The project exposes RINI and its product to all Partners in the project and through them to a Global market. - Participation in numerous pilots provide unique marketing opportunity for our products. - Engagement with SILVANUS partners will open new opportunities for both the new product development and research.
	3. Means to achieve your objectives: Although RINI is only 3 years old and its incorporation coincided with COVID-19 pandemic, company grows strongly and currently employs 8 staff, most of whom are engineers. In addition to IPR and product range provided by its parent company from the UK, in the short time RINI developed its own product range which will be used in SILVANUS.
	4. Opportunity which appeared/appears: Deliverables that RINI will be providing (MESH-in-the-SKY) will be in demand by other customers in Croatia and abroad. Furthermore, the developed system will provide a strong foundation for future R&D introduction of new innovative products.
WHAT AND WHY	**5. Exploitable assets and results:** IPR on MESH-in-the-SKY wireless communication system, which will be developed as a result of RINI's participation in SILVANUS, will become one of the main new products and we expect it will generate significant revenues from the existing and new customers.
	6. Rationale: This new IPR will increase company value and will contribute to credibility of RINI in the highly competitive wireless communications market.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: We would like to establish strong partnership and collaborative links with SILVANUS partners as these will create a foundation for joint commercial exploitation of our and theirs product as well as set up research collaboration in future R&D Projects.
ROADMAP WITH	**8. Roadmap: the timeline plan you have for using those assets:** Our internal Product Roadmap assumes using the developed assets within 6-12 months from the completion of SILVANUS.
	9. Measurement: Generated revenues. We expect at least €1m in revenues in the first 3 years of exploitation.

	10. Positioning: The developed MESH-in-the-Sky system will be unique in the wireless communications market as it will enable long range broadband communications between numerous UAVs and Forest Fire stakeholders on the ground. However, as a start and late entry to the market, RINI is currently at the very beginning of the path to become a noticeable player in this market and this is where SILVANUS could be of huge benefit for RINI.

11.2.18 Partner No 22 - MICRO DIGITAL DOO ZA INFORMACIJSKE TEHNOLOGIJE (MD)

	QUESTIONS
	1. Partner profile: Micro Digital is an ICT-oriented small Croatian enterprise, focused on making the existing critical infrastructures and processes go digital and sustainable. The company strongly focuses on lifecycle impacts, shifting toward sustainable operation and is particularly well-versed in retrofitting the digital technologies and novel digital practices in the established industries, increasing their environmental sustainability, as well as reducing their carbon footprints. MD experts helped in ensuring one of the key industry players in Croatia unlock their innovative research potential through participation in H2020 projects. Areas of expertise include detailed financial and administrative management for H2020 projects, assessment of socio-economic impacts in high-profile industry and energy projects, stakeholder engagement, communication and dissemination of H2020 project results.
	2. Your motivation to participate in the project and commitment: Micro Digital is the dissemination coordinator, leading Work Package 10. The reason for joining the consortium is due to the expertise of Micro Digital in managing H2020 projects, the experience of its experts in various energy and environmental infrastructure projects, and a further interest in the topics of wildfire prevention.
	3. Means to achieve your objectives: Micro Digital has a small but diverse group of experts from various backgrounds (social sciences, electrical engineering, economics, event organization and management) to fulfill the assignments of the dissemination coordinator, to expand the network of stakeholders from diverse target groups such as energy and infrastructure industry, firefighting associations, the financial sector, etc. The successful implementation of SILVANUS project is a top priority.
	4. Opportunity which appeared/appears: This project is in line with the H2020 and other EU environmental and energy projects MD is already working on, where MD can use their know-how in advancing the targets set both by those projects and by SILVANUS. Therefore, Micro Digital hopes that there will be other opportunities in the pipeline after finalizing SILVANUS.
WHAT AND WHY	**5. Exploitable assets and results:** MD hopes that the skills of individual experts, their knowledge on stakeholder engagement, assessment of socio-economic impacts, and the development of dissemination tools, will be exploitable in the future.
	6. Rationale: Further consultancy for R&D projects and positioning as a reliable partner in stakeholder engagement activities, assessment of socio-economic impacts, development of dissemination tools for international environmental projects on an EU and international level.

	7. Your Value Proposition towards Joint Exploitation of SILVANUS: MD, along with its WP10 Task Leaders (ATOS, TUZVO, LETS, PUI), will prepare a stakeholder engagement plan, managing the Sustainable and Resilient Working Groups, and consolidate the external stakeholder network. MD is also coordinating the WP10 Task Leaders responsible for the SILVANUS platform exploitation plan led by ATOS, and the establishment of the Centre for Adaptation Strategies and Development led by TUZVO. All SILVANUS partners are expected to give MD as much stakeholder input as possible to increase and improve the stakeholder network on all levels. MD will assemble the final stakeholder network which will be an important step in the joint exploitation.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** Stakeholder analysis in the second half of the project, after establishing the Minimum Viable Product, will help to establish target audiences for joint exploitation.
	9. Measurement: Impacts will be measured for SILVANUS within the KPIs established in the SILVANUS communication strategy, which are verified on a yearly basis within the annual dissemination reports.
	10. Positioning: The key positioning aspect is to establish further MD as the consulting partner in stakeholder engagement, determination of socio-economic impacts, dissemination and exploitation, beyond the duration of SILVANUS, through joint exploitation and through projects that will further advance the fulfillment of energy and environmental objectives in accordance with the European Green Deal targets.

11.2.19 Partner No 23 - POLITECHNIKA WARSZAWSKA (WUT)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** Warsaw University of Technology (WUT) is one of the leading institutes of technology in Poland, and one of the largest in Central Europe. It employs 2,453 teaching faculty, with 357 professors (including 145 titular professors). The student body numbers 36,156 (as of 2011), mostly full-time. There are 19 faculties covering almost all fields of science and technology. The Institute of Computer Science is one of a few academic institutions in Poland with the longest tradition in computer research & development and education. The teaching in the field of computing and computers was started early, so that the first few MSc degrees in Computer Science were granted in 1962. From then on, the regular curricula in the field have been proposed with up to 80 students graduating each year. So, over last sever-al decades more then 2500 computer professionals have been graduated from the Institute. Currently, there are 75 people employed in the Institute of Computer Science, including 61 members of academic staff (9 professors, 1 associate professors, 28 assistant professors with a PhD degree, 8 assistants, 15 senior lecturers). The remaining employees are the engineering, laboratory and administrative staff.
	2. Your motivation to participate in the project and commitment: WUT is responsible for ensuring cybersecurity within the SILVANUS project. WUT supports companies and institutions by doing research in relevant fields and enriching solutions, products, policies, etc. Computer Systems Security Group at Institute of Computer Science at WUT has had over 15 years of experience in working collaboratively on developing research proposals and successfully deliver and demonstrate research projects. The proposals are mostly related to the communications technologies and their security.

	3. Means to achieve your objectives: The Institute of Computer Science is one of the six Institutes within the Faculty of Electronics and Information Technology, Warsaw University of Technology. The Institute's main research areas include cybersecurity, computer graphics, computer systems' architectures, software engineering, artificial intelligence and information systems. These research and teaching areas have influenced the organisation of the Institute: its staff is subdivided into four Divisions. To each of divisions belongs a specialised laboratory unit for carrying out the research and also for students preparing their major projects and diploma theses. Besides these three specialised laboratories, the Institute runs a large Computing Laboratory (more then 100 PCs and workstations) where students do most of their practical work.
	4. Opportunity which appeared/appears: SILVANUS is in line with other projects that WUT participated in as the WUT team develops novel security architecture and mechanisms for communication networks and computer systems.
WHAT AND WHY	**5. Exploitable assets and results:** Exploitable assets and results include specific components (e.g., STM or RPI boards), various software tools, expertise in developing security mechanisms and secure architectures as well as methodologies to conduct research and systematic evaluation of the created solutions.
	6. Rationale: WUT plans to exploit the assets through the creation of academic publications as well as utilize gained knowledge during the student courses conducted at WUT.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: From project partners, we expect the ability to formulate the requirements for the security solutions that would need to be developed in the course of the SILVANUS project. Apart from that, we also hope to collaborate with partners while creating and developing appropriate security solutions.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** We do not have specific deadlines but as an academic partner, we are expected to provide a number of scientific publications as this is important for evaluating process of universities in Poland.
	9. Measurement: We measure it in the number of developed security solutions, their performance and effectiveness that will be documented in the scientific publications that we would create.
	10. Positioning: N/A

11.2.20 Partner No 24 - HOEGSKOLAN I BORAS (HB)

	QUESTIONS
PROFIL	**1. Partner profile:**

The University of Borås / Högskolan i Borås (HB) (www.hb.se), has approximately 13 000 students and 750 employees. In collaboration with the public and private sectors, the university conducts education and research of high international quality with societal relevance. HB's strategy is to carry out research and teaching at a high scientific level and in close relationship with industry and the public and cultural sectors. HB has a well-developed department for administrative and economical routines for EU projects through its Grants and Innovation Office that serves researchers during participation in Horizon 2020 projects in the pre-project phase as well as during and after an EU project. The support structure includes research, finance, specialised IP, and legal advice. So far, HB has won 11 Horizon 2020 grants of which 2 as coordinator (e.g.,SUITCEYES). This is in addition to multiple other EU-funded projects in earlier programmes (e.g., FP7) such as SHAMAN and PERICLES. HB also coordinates two large ERDF projects: CircularHub and Ways2Taste. Both of them are focusing on realization of circular economy, within the textile & furniture industries and the food industries respectively. Part of HB is also a Science Park focusing on developing and implementing circular business models. As part of HB, SSLIS is one of the leading institutes of its type in terms of size and contribution to its field, both nationally and internationally. Although evaluation and ranking measures are not common in the area, in an evaluation by the government agency for higher education in Sweden the School was ranked as No. 1 in Sweden and No. 25 in QS World University Rankings by subject Library and Information Management 2022. SSLIS is a member of the iSchools group and has organized many conferences (e.g., iConference 2020) and hosts The Centre for Cultural Policy Research (KPC) and Centre for Welfare Studies (CVS). It is also the publisher of a number of national, Nordic and international journals including Information Research (IR), which is indexed in many core databases including Web of Science, Scopus, ACM Digital Library, Google Scholar, INSPEC, LIS&T Abstracts, and LISA.

2. Your motivation to participate in the project and commitment:

The HB team members come from information science. They have strong competencies in several different areas, such as users' communication and information behaviour, information management, knowledge organisation, semantic relations and machine learning as well as in information systems. Team members have worked with developers of digital preservation systems, assistive technologies and different applications to evaluate users' needs and transform those to system requirements, used participative design technologies and conducted analytical reviews of previous research in various related areas. Thus, the HB team will provide expertise in the area of citizen engagement and information use by citizens during the stage of fire prevention and monitoring of the environment, including the development of the methodology for the participatory process. In addition, they will be involved in developing the mobile application and its adoption by citizens and reviewing sustainable forest management services and their relevance to the local population. HB's support extends to various tasks spread over Phases A-C, from the efforts towards conducting initial studies, building the knowledge base, engagement activities, and developing methodologies and models.

3. Means to achieve your objectives:

HB has assigned SILVANUS to several researchers with different research areas and expertise, for example, Systematic methodology for participatory process, Assessment framework, information system development. Citizen engagement in the public sector, Information and communication behaviour, Social media sensing and concept extraction, Semantic framework for information fusion, Platform integration, Dissemination and communication across global communities. These competencies are relevant to several WPs in SILVANUS that HB is involved in.

4. Opportunity which appeared/appears:

One of the leading research areas at HB is "information science", in which communication, information management, information design, information systems, dissemination and analysis are relevant to this research field. HB has already participated and participates in several EU projects. SILVANUS is another

	opportunity to strengthen this research tradition at HB and re-use the results and the knowledge in the other project.
WHAT AND WHY	**5. Exploitable assets and results:** • **The Overall framework for CEP (CEP modalities):** HB is developing a framework for citizen engagement (CE) in wildfire prevention and management. The framework shows different modalities and examples of CE. The framework can be used as a guide to develop CE in the future in different countries and other areas requiring high risk management effort. • **The knowledge and content for CEP(HB):** the knowledge and content of CEP is the result of different studies, and it is categorized to be used in developing CEP. • **CEP plan and design tools:** several tools used in developing different modalities in citizen engagement. • Further, from previous Framework Programs and Horizon 2020 projects, HB has accumulated knowledge, methodologies and skills in advanced machine learning, natural language processing, and semantics. Its role in the organization of evolving knowledge has become useful for SILVANUS, is enhanced within this project and can serve other similar international, EU and national projects.
	6. Rationale: HB is interested in using the gained knowledge in this project for research purposes in future projects. As an academic partner, HB may also share the acquired knowledge (reports, results, etc.) with relevant stakeholders, authorities, and citizens to create a societal impact in Sweden. HB is also interested in exploiting the above assets/intellectual properties through publications in journals, conferences, seminars and webinars. Both practical and academic contributions are not only useful for society and academia, but also raise profile of HB and its LIS researchers within risk information and communication management areas. On the other hand, our machine learning related R&D activities integrate findings in a new research area called evolving semantics, which combines the time-dependent topical diversity of communication with like concept shifts relevant for ontology maintenance in the long run. As we share these results with dedicated company partners in SILVANUS, our plan is to focus on their academic exploitation.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: HB supports different partners from a theoretical and methodological point of view and shares with other partners state of the art in citizen engagement and scientific methods to understand and explain citizens' communication and information needs and analysis of their participative behaviour to develop CEP and its content. HB provides a vital methodology and tools for linking professional firefighting activities with the grassroot contributions to forest fire prevention, response and environment restauration increasing success of all. For example, HB has designed the overall framework for CEP. HB has prepared and shared several tools to collect information from partners/stakeholders to develop CEP. HB has also created a study protocol helping partners to conduct studies of involved institutions and citizens to develop CEP. HB also has a joint effort with T3.6 to contribute to user needs and requirements for CE mobile apps and design relevant content and features. HB expect other partners to provide suitable content for the CEP. On the computational side, we are working on closer cooperation with CERTH and CTL with whom we have complementary portfolios of R&D interests, and depend on them as WP and task leaders to relay our contributions to other WP partners. We expect that our methodology to group relevant semantic content e.g. in social media, plus a dynamic view of semantic content agglomerations, will help the Command Centre to monitor both crisis communication to society, and professional crisis solution. Also, we believe that the SILVANUS platform as a highly advanced and integrated proof-of-concept can be expanded to other domains of disaster management.

ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** The results will be delivered in D3.3 in month 18 and D3.5 in month 36. CEP will be presented to the board. The result from HB's work will influence the CE mobile app regarding the user needs and requirements and also the content. HB will also hold different CE activities with other partners' help and disseminate CE information in terms of posters, campaigns, online courses(material), etc. After the project period, HB will use its intellectual properties, achievements and assets in the project for research purposes to strengthen the research profile at HB and also to create societal impact, as stated in the previous sections.
	9. Measurement: There are different KPIs: • Number of engaged citizens in CE activities. • Number of users using the CE mobile app • Number of views for disseminated information, for example posters on social media • Number of participants in webinars and seminars, and training sessions. • Number of stakeholders and authorities involved in the design and dissemination of the CE toolkit • (WP4&5) The evaluation of machine learning results has strict scientific rules which must be adhered to. Beyond them we have no new evaluation criteria in mind. Whether there will be developed success criteria for the operational quality of the Command Centre is beyond our capacities to assess.
	10. Positioning: Citizen engagement programmes and platforms cannot be regarded as competitors, rather as examples of best practice and collaborators. Here are several examples of the platforms with similar aims offered by various organizations: Open Social in Netherlands (https://www.getopensocial.com/about-us/) offers community engagement platform both public open source and subscription-based for NGOs. Includes several interesting services, but lacks risk management features. The Citizen Engagement and Reform Communication Program (CERC) offered by IREX in the US (https://www.irex.org/project/citizen-engagement-and-reform-communication) for building understanding and trust between citizens and police by establishing platforms for communication, engagement, and collaboration through libraries and other civic platforms. International Rescue Committee has developed a Risk Communication and Community Engagement resource package (https://rcce.rescue.org/) and offers access to them in various languages. Being an academic partner with no market connections, all we can suggest is that the study of dynamic/evolving semantic content is an expanding research domain with many interacting branches and exponentially increasing application opportunities

11.2.21 Partner No 25 - GEOPONIKO PANEPISTIMION ATHINON (AUA)

	QUESTIONS
PROFILE AND	**1. Partner profile:** The Agricultural University of Athens - AUA is the third oldest university in Greece, after the University of Athens and the National Technical University of Athens (Metsovio). It was established by law in 1920 (Law 1844/1920) as an Independent Higher Education Institute with university status under the name of the Highest Agricultural School of Athens (H.A.S.A.). In 1989, the H.A.S.A. was renamed the Agricultural University of Athens and organized into seven independent academic departments (Presidential Decree 377/1989) and although its Greek title was modified in 1995 (Presidential Decree 226/1995), the English one (AUA) remained unchanged. AUA is a public university. According to Article 1 of its Internal

Regulations, AUA provides education at both undergraduate and postgraduate levels covering all sectors of agricultural activity. Its educational programmes, combining theoretical teaching with laboratory exercises and practical training, are based on empirical experience and are closely related to the problems and perspectives of Greek agriculture. The AUA programmes aim at equipping its graduates for their role as competent agriculturalists/agronomists, who may provide instruction and support to the farmer, participate in the planning of the agricultural development of the country, and through their research contribute to the solution of problems within the agricultural sector and to the management of natural resources for the production of agricultural products. AUA serves as a centre of basic and applied research, aiming at the development of agricultural science and the self-reliance of Greek agriculture for the benefit of the agricultural population and the Greek people. AUA has 6 Schools, 14 Departments, 19 Master's Degree Programs, 8 Doctoral Studies Programs, 28 Building Complexes, 44 Equipped Laboratories, 55 Auditoriums and Lecture Halls, as well as 13 Greenhouses. AUA has over 7,000 undergraduate students and more than 1,200 post-graduate students and PhD candidates. AUA has a long track record, having produced over 7,800 Publications in peer-reviewed international journals, with over 150,004 citations, 76 Patents and completing over 4,500 Funded research projects.

2. Your motivation to participate in the project and commitment:

We perceive this collaboration as a significant opportunity to apply our wide-ranging expertise in a meaningful and impactful manner, aiming to address challenges related to forest management, wildfire prevention, and overall preservation of the Mediterranean ecosystems.

Our role in the SILVANUS consortium is multifaceted. Given our longstanding experience in agricultural development and natural resource management, we contribute our theoretical knowledge and practical skills to facilitate the creation and implementation of sustainable forest management strategies. Furthermore, we apply our scientific research capabilities to generate solutions to persistent problems in the sector, particularly concerning wildfire prevention and ecosystem restoration. This contribution aligns seamlessly with our institution's mission of leveraging research to address Greek and international agricultural and environmental issues.

Our dedicated faculty and researchers, coupled with our extensive laboratory infrastructure, support several important tasks of the project. We engage in field studies, data analysis, and predictive modelling, thereby contributing to the development of innovative tools and practices in forest management. Our wide network within the agricultural sector in Greece will also be invaluable in the project's efforts to engage relevant stakeholders and disseminate the project's findings and tools effectively.

This partnership with the SILVANUS consortium aligns perfectly with AUA's strategic focus on contributing to local and global agricultural and ecological advancements through meaningful collaborations. Additionally, AUA is involved in drafting the policy recommendation documents that can help steer policy makers based on best practices across all SILVANUS pilots.

Lastly, being an academic institution, we are committed to fostering a learning environment that stays abreast of cutting-edge developments. Participation in SILVANUS offers our faculty and students a unique opportunity to engage with state-of-the-art technologies and methodologies. The hands-on experience gained by our personnel during the project will not only enrich their academic journey but will also prepare them to become future leaders capable of tackling global environmental challenges.

3. Means to achieve your objectives:

The Agricultural University of Athens (AUA) has a robust infrastructure and a breadth of resources to achieve its objectives in the SILVANUS project. Our capabilities stem from a mix of specialized departments, experienced faculty, and state-of-the-art facilities that reinforce our commitment to agricultural development and natural resource management.

Expertise and Departments: With 6 Schools, 14 Departments, and a team of dedicated faculty, we have a wealth of knowledge across a broad range of agricultural and environmental disciplines. This expertise spans sectors such as forestry, ecology, agronomy, environmental biology, geoinformatics, and more, all

	of which are valuable to the project. Our academic and research staff are experienced in both theoretical and applied research, equipping them to contribute to various aspects of the SILVANUS project. **Laboratories and Facilities**: We have 44 equipped laboratories and 13 greenhouses that serve as hubs for scientific exploration and innovation. These facilities enable us to conduct comprehensive experiments and field studies, perform advanced data analysis, as well as develop and test innovative solutions for agricultural and environmental challenges. **Research Output**: AUA has a strong track record in producing high-quality research, with over 7,800 publications in peer-reviewed international journals, more than 150,000 citations, and 76 patents. Our researchers are experienced in collaborating on funded research projects, completing over 4,500 to date. This research output evidences our capacity to contribute to the knowledge generation required for the SILVANUS project. **Student Body**: With over 7,000 undergraduate students and more than 1,200 post-graduate students and PhD candidates, our university has a vibrant academic community that can contribute to the project. These students, guided by our faculty, can assist in research, fieldwork, and data analysis. **Networks and Partnerships**: We have established relationships within the agricultural sector in Greece and beyond, giving us access to a network of relevant stakeholders. These connections will be crucial for stakeholder engagement and dissemination activities within the SILVANUS project.
	4. Opportunity which appeared/appears: Participation in the SILVANUS project aligns seamlessly with AUA's ongoing efforts and strategic priorities in agriculture and natural resource management. As a longstanding institution in Greek agricultural education and research, AUA sees its involvement in SILVANUS as an opportunity to expand its contributions to the sector, particularly in the context of wildfire prevention and environmental monitoring. SILVANUS allows AUA to build upon previous projects (e.g., projects Organic Edunet, ADVICE, TrustFood), leveraging acquired know-how and insights in agriculture and natural resource management. For example, research findings, methodologies, and technologies from past projects can be applied, refined, or further developed for SILVANUS' objectives. Further, SILVANUS presents the opportunity to strengthen relationships with existing partners and forge new collaborations, both locally and internationally. These connections will be invaluable for future projects and initiatives. Once SILVANUS is complete, AUA anticipates additional opportunities arising from the project's outcomes. These include: **Research Opportunities**: Findings from SILVANUS will identify new research questions and challenges, opening up avenues for future studies and projects. AUA's faculty and students could pursue these opportunities for academic advancement and societal impact. **Educational Enhancements**: The lessons learnt from SILVANUS can be integrated into AUA's academic programs, enriching the educational offerings for students. This will manifest in the form of new course content, practical training opportunities, or case studies for courses. **Community Impact**: The work done in SILVANUS will directly contribute to the welfare of local communities by enhancing wildfire prevention and environmental monitoring. AUA can continue to engage with these communities post-SILVANUS, applying the developed methodologies and technologies to address other environmental and agricultural challenges.
WHAT AND	**5. Exploitable assets and results:** Given the Agricultural University of Athens' (AUA) breadth of knowledge, expertise, and resources in agricultural and environmental sciences, it's positioned to contribute significantly to the SILVANUS project. AUA's faculty comprises experts in agricultural and environmental sciences, including climate change, biodiversity, forestry, and resource management. This knowledge could help shape the development and

application of the SILVANUS platform. The university's extensive research facilities, including laboratories and field stations, could serve as important resources for testing and implementing aspects of the project. Its greenhouses and land could provide real-world environments for testing the platform's predictive models and training methodologies. AUA has a strong foundation in data science as applied to agricultural and environmental contexts. The university could contribute valuable insights from large data sets, including earth observation resources, climate models, and weather data. AUA's existing relationships with local and regional agricultural communities, policy makers, and industry partners could facilitate stakeholder engagement and the dissemination of the SILVANUS platform. The university's academic programs and training could be leveraged to support the development and implementation of the SILVANUS training methodology for firefighters. Given the university's track record of securing research funding and producing high-quality research outputs, its administrative and research personnel are well-versed in project management, ensuring that project milestones and deliverables for SILVANUS are met on time and within budget. The students at AUA represent a diverse array of skills and interests. These assets make AUA a potentially invaluable partner in the SILVANUS project, contributing towards the platform's development, validation, and successful implementation.

6. Rationale:

AUA's assets hold significant value for a variety of reasons and can be leveraged in numerous ways to achieve academic, research, and commercial goals. These assets not only elevate AUA's reputation in the academic community, but they also offer avenues for further research and discovery. Collaborating on a project like SILVANUS allows the faculty to apply their knowledge in real-world contexts, create new research opportunities, and contribute to innovative solutions. The research infrastructure enables practical, hands-on learning experiences for students and faculty, which can improve the quality and applicability of their education and research. Harnessing data analysis in environmental and agricultural contexts has enormous potential for both academic and industrial advancements. In academia, these capabilities can lead to groundbreaking research and publications. Industrially, AUA could potentially provide data analysis as a service, offer consulting, or even develop proprietary algorithms and software that could be commercialized. A robust network offers numerous benefits. It provides a direct link to the end-users of the research, providing valuable feedback and fostering collaborations. In an industrial context, these connections can lead to partnerships, commercial opportunities, or even the creation of start-up companies. Expanding and improving educational programs using experience from the SILVANUS project can attract more students, enhance the university's reputation, and better prepare graduates for their careers. In addition, the development of specialized training programs can lead to certification services, which could be offered commercially. Experience with managing and successfully delivering funded research projects positions AUA well for securing future grants. It also builds credibility with potential industrial partners. In summary, these assets allow AUA to advance its academic mission, contribute to meaningful research, forge strong industry connections, and potentially generate revenue through commercialization of its research and services. Participating in projects like SILVANUS helps AUA maintain its position as a leading agricultural university, driving innovation in agriculture and environmental management.

7. Your Value Proposition towards Joint Exploitation of SILVANUS:

In a collaborative project like SILVANUS, mutual expectations among partners are crucial for ensuring a successful outcome. Partners should be willing to share their specific expertise and skills. This could involve technical capabilities, knowledge in relevant fields, or understanding of specific geographies or communities. A successful partnership requires open and respectful communication, along with a willingness to compromise and problem-solve as a team. Partners should meet agreed-upon timelines, deliverables, and commitments to ensure the project progresses as planned. Depending on the nature of the project, partners may be expected to share their resources, whether that's data, research facilities, or personnel. Partners can facilitate introductions to relevant stakeholders in their networks, potentially leading to additional collaborations, funding opportunities, or avenues for dissemination.

AUA can provide substantial academic and practical knowledge in agricultural sciences and environmental management. With its extensive infrastructure and expert faculty, AUA can contribute significantly to the research and development aspects of the project. AUA's capabilities in data analysis can contribute to building robust models and insights in forest fire management. AUA's existing relationships with local and regional communities, policy makers, and industry partners can assist with stakeholder engagement, validation, and dissemination of project outcomes. AUA's educational expertise can support the development of training programs, particularly for firefighters and forest management personnel.

All partners in the SILVANUS project will likely share a common interest in developing effective solutions for forest fire management. There would be mutual benefit in regularly sharing research findings, insights, and best practices amongst partners. AUA and its partners may share interests in leveraging and developing technology for environmental management, such as the integration of advanced semantic technologies, big-data processing frameworks, and innovative wireless communication infrastructure. Partners may have a shared interest in influencing policy related to forest fire management and climate resilience. All partners should be interested in the long-term sustainability and success of the project, as well as potential follow-up projects or collaborations. This includes aspects like securing ongoing funding, ensuring the platform is maintained and updated, and continually engaging stakeholders.

By setting clear expectations and understanding the shared interests and benefits of the partnership, AUA can contribute meaningfully to the SILVANUS project and forge strong, productive relationships with its project partners.

ROADMAP WITH TIMELINE

8. Roadmap: the timeline plan you have for using those assets:

The Agricultural University of Athens (AUA) has a comprehensive roadmap for leveraging the assets generated from the SILVANUS project for months 22-30:

- Month 22: AUA will be synthesizing findings from the research conducted thus far and beginning the development of educational materials based on these findings.
- Month 26: AUA will start integrating SILVANUS project outcomes into its academic curriculum, focusing on graduate and doctoral programs initially. Training sessions will be conducted for faculty members to acquaint them with the new content.
- Month 28: AUA will host a workshop inviting industry partners, stakeholders, and other universities to disseminate knowledge acquired and demonstrate the applications and utilities of project outcomes.
- Month 30: AUA will prepare a comprehensive report summarizing the project's achievements and lessons learned, to be shared with the consortium board, academic community, and relevant industry stakeholders.

Post-project Actions:

- Integration into Curricula: AUA will continue to integrate project outcomes into undergraduate courses and refine the content in the graduate and doctoral programs based on student feedback and evolving research.
- Further Research: The university will leverage the results of the SILVANUS project to inform further research in the field of environmental monitoring and wildfire prevention, potentially leading to new projects.
- Collaborations: AUA plans to continue its collaboration with the project partners and extend the scope to new partners for further application of project outcomes.
- Community Outreach: AUA will use the knowledge and tools developed in SILVANUS for community outreach, contributing to local communities by providing expertise in environmental management and wildfire prevention.

9. Measurement:

Measurement of impact is an essential part of any project as it helps assess the effectiveness and success of planned actions. The most straightforward way to measure impact is to check whether the project's

	objectives have been met. These could include specific goals related to the development of the platform, training programs, or stakeholder engagement initiatives. If the platform or other outputs are available to end-users (like fire management authorities or firefighters), then usage statistics, user feedback, and user success stories can be valuable measures of impact. AUA can evaluate the number of research papers published, patents filed, conference presentations made, or citations received as a result of the project. AUA can seek feedback from project stakeholders (including partners, funders, and end-users) to gauge how well the project has met their needs and expectations. For training initiatives, impact could be measured through the number of individuals trained, their performance in assessments, and feedback on their preparedness for real-world scenarios. If the project has policy objectives, AUA could track any changes in related policies or public discourse that have resulted from the project's advocacy efforts. If any commercial ventures (like certification services or consultancy) have resulted from the project, AUA could measure impact in terms of revenue, job creation, or market penetration. The project's success in securing ongoing funding, maintaining the platform, and sustaining stakeholder engagement could also be considered measures of impact. Finally, AUA could try to measure the wider societal and environmental impact of the project. This might include assessing changes in public awareness about forest fires, improvements in forest fire management, or reductions in forest fire damage. All these measurements should ideally be compared to baselines established at the start of the project, and also to any targets set for the project's outcomes. By systematically measuring impact in these ways, AUA can gain a thorough understanding of the project's success and areas for potential improvement.
	10. Positioning: One of AUA's unique positioning points lies in its blend of traditional agriculture studies with cutting-edge technology and sustainable practices, as seen in its involvement in the SILVANUS project. In comparison, while several other universities offer similar programs, few have the unique combination of resources, expertise, and focus on sustainable agriculture practices that AUA has cultivated. An alternative to the resources and outcomes of the SILVANUS project could be the development of individual, standalone studies or projects focusing on environmental monitoring, wildfire prevention, and sustainable agricultural practices. However, these would lack the comprehensive, integrated approach and the diverse partnership consortium that the SILVANUS project provides. Regarding market figures, the global environmental monitoring and sensing market is projected to grow significantly, fueled by rising concerns about climate change and the need for sustainable development practices. This trend indirectly supports the relevance and value of AUA's research and outcomes from the SILVANUS project, which align with these global needs. The positioning of AUA, therefore, is strongly linked to its active engagement in addressing significant global environmental issues, its multi-disciplinary approach, and its forward-thinking and integrative research projects like SILVANUS.

11.2.22 Partner No 26 - ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS (CERTH)

	QUESTIONS
PROFILE AND	**1. Partner profile:** The Centre for Research and Technology-Hellas (CERTH), founded in 2000, is the only research centre in Northern Greece and one of the largest in the country. CERTH has important scientific and technological achievements in many areas including: Energy, Environment, Industry, Mechatronics, Information & Communication, Transportation & Sustainable Mobility, Health, Agro-biotechnology, Smart farming, Safety & Security, as well as several cross-disciplinary scientific areas. Today CERTH consists of the following five institutes: (a) Chemical Process & Energy Resources Institute (CPERI), (b) Information Technologies

Institute (ITI), (c) Hellenic Institute of Transport (HIT), (d) Institute of Applied Biosciences (INAB), (e) Institute of Bio-Economy and Agri-Technology (iBO). In the SILVANUS project, CERTH participates through ITI.

The Information Technologies Institute (ITI) of CERTH was founded in 1998 as a non-profit organisation under the auspices of the GSRT (General Secretariat of Research and Technology of Greece), with its head office located in Thessaloniki, Greece. Since 2000 it has been a founding member of the Centre of Research and Technology Hellas (CERTH), also supervised by the Greek Secretariat of Research and Technology. ITI is one of the leading Institutions of Greece in the fields of Informatics, Telematics and Telecommunications. ITI's areas of research relevant to Artificial Intelligence include deep learning methods, semantic multimedia analysis, Image and Signal Processing, Computer & Cognitive Vision, Pattern Recognition and Machine Learning, Human Computer Interaction, Virtual and Augmented Reality, Artificial Intelligence, Security and Surveillance, Biomedical Applications, Environment, Geoscience and Remote Sensing, Communications and Networking, Multimedia, Database and Information Systems, social media analysis, e-Government, Cultural and Educational Technology and Integrated Commercial Solutions. CERTH-ITI is also an active member of the European Cyber Security Organisation (ECSO), i.e., the contractual counterpart to the European Commission for the implementation of the Cyber Security contractual Public-Private Partnership (cPPP).

2. Your motivation to participate in the project and commitment:

CERTH's core motivation is research and development in order to innovate and introduce new algorithms, models, services, and products. CERTH's main contribution to the project of SILVANUS pertains to social media, offering an additional source of information (crowdsourcing) as added value and presenting a full-stack solution for detecting fire incidents with social sensing, from retrieving real-time social media data to analysing and visualizing them. As a secondary role, CERTH participates in the implementation of interactive maps for the visualization of fire spread forecasting and fire hazards models. Additionally, it contributes in the production of metadata for the areas that have burned in order to be channeled into the respective models for the prevention and prediction of an eventual fire.

3. Means to achieve your objectives:

The participating team, namely the **Multimodal Data Fusion and Analytics Group (M4D) of the Multimedia Knowledge and Social Data Analytics laboratory (MKLab)**, has significant experience in artificial intelligence and more specifically in the fields of machine learning, deep learning, multimodal retrieval, multimedia analysis, visual analytics, computer vision, knowledge engineering, semantic integration of heterogeneous resources, semantic reasoning, discovery and mining of heterogeneous multilingual and multimedia Web resources, social media monitoring, as well as on the processing and analysis of the multimodal data extracted from them. On top of this vast experience, M4D/MKLab has built an infrastructure of considerable computational capacity (100+ cores, 600+ GB RAM, 40+ TB storage) and developed a sophisticated distributed architecture for data collection and indexing, as well as a variety of cutting edge data mining and retrieval algorithms. The team is therefore in an excellent position to support a wide range of data collection, mining and indexing needs.

4. Opportunity which appeared/appears:

The opportunity that appears for CERTH in the SILVANUS project is the close communication with end-user partners who can also be potential customers. On the topic of continuity, CERTH reuses the know-how that has been obtained from previous European projects and SILVANUS is another opportunity to further develop and evaluate the existing work on social media data analysis.

WHAT

5. Exploitable assets and results:

	● **Fire detection based on social sensing:** The key feature of this component is that it offers a full-stack solution for detecting fire incidents with social sensing, from retrieving real-time social media data to analyzing and visualizing them. Another feature that distinguishes this component from other competitive solutions is the incorporation of a social media analysis toolkit that extracts further knowledge from the posts' textual and visual content and does not stay limited to the original information that Twitter provides. Finally, it is dedicated to fire events, while most market products concern the monitoring of a brand. ● **Burned area mask:** Calculating and generating metadata from burned areas of interest, in order to feed the data to the corresponding models. ● **Visualization layers:** Implementation of interactive maps/layers in order for operators to be able to monitor the fire spread possibility but also the risk of an underlying fire, assisting them to take the necessary actions.
	6. Rationale: CERTH is interested in exploiting the above assets through publications in journals and conferences, while in the case of the social sensing component, CERTH also targets its commercialization.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: Regarding the social sensing component, other SILVANUS partners are going to contribute with the integration of the solution into the SILVANUS system as well as with the visualization of the collected and analyzed social media data. What CERTH shares with the SILVANUS consortium is an additional source of information, deriving from social sensing, which can be exploited by other modules (e.g., to be considered in severity estimation).
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** ● **Fire detection based on social sensing asset:** The first phase of the development will be until M18, when the demo presentation of the Social Sensing user product (UP3) will take place. The second phase of the development, which will be significantly based on the feedback of the end users, will last till the end of the task (M36). After the end of the project, a presentation of the final product will be available on M4D's website. Furthermore, there will be general promotional activities through the lab's communication channels, such as blogspots and Twitter, and participation in events like tech expos.
	9. Measurement: To measure the impact of the social sensing component, we will employ analytics, such as website clicks and post views, as well as tracking the number of interested customers.
	10. Positioning: The Social Sensing component, in contrast to its competitors, is dedicated to fire-related posts only, involves AI techniques to extract further knowledge from the original social media data, and finally does not rely on the limited geoniformation provided by Twitter, but employs automatic geotagging.

11.2.23 Partner No 27 - PANEPISTIMIO THESSALIAS (UTH)

UTH as an Academic partner has a strong commitment in pursuing the public interest objectives set by its charter and, in that sense, there is a strong interest in the exploitation of the SILVANUS results. Postgraduate and Ph.D. students will benefit from the applied research activities that will be introduced through the implementation process. The Department of Informatics and Telecommunications has a M.Sc. course with a direction dealing with large scale distributed data streams management. The participation of

UTH in the SILVANUS project will exploit R&D opportunities for M.Sc. students, research activities and theses. UTH will also contribute to the research community through papers, book chapters and article submissions to high impact international conferences and scientific journals. Finally, a number of research institutes and spin off companies are active under the UTH coordination, thus, the SILVANUS outcomes will be disseminated and exploited through these channels as well. UTH's participation in SILVANUS aims at increasing the understanding of the research community on the subject of intelligent data management, and applied machine learning, establishing the UTH's position as a significant research centre in the corresponding activities.

11.2.24 Partner No 28 - ASSOCIACAO DO INSTITUTO SUPERIOR TECNICO PARA A INVESTIGACAO E DESENVOLVIMENTO (IST)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** The Associação do Instituto Superior Técnico para a Investigação e Desenvolvimento (IST-ID) is a private not-for-profit institution, which primarily aims at carrying out Science and Technology activities, fostering knowledge transfer and promoting the involvement of national and foreign researchers, both at national and international levels, in RD&I projects in their areas of expertise. IST-ID carries out RD&I activities in major areas which are associated with challenges with a strong impact on society. These are strongly interdisciplinary areas in nature crossing different fields of engineering, science and technology and architecture. The RD&I activities comprise not only fundamental aspects but also projects with a strong applied component. Instituto Superior Técnico (IST) is one of the founding associates of IST-ID and, through partnership agreements, makes available the majority of facilities where IST-ID activities are carried out. IST is the largest and most reputed school of engineering, science and technology in Portugal. In addition to its own research teams, hired directly by IST-ID as part of the research projects it manages, IST makes available to IST-ID a number of professors and researchers, under the Third-Party agreement between these two institutions, to pursuit the RD&I activities promoted by IST-ID. The Research Unit with which IST-ID participates in the SILVANUS project is MARETEC - Marine, Environment and Technology Centre. One of MARETEC's fields of activity is biodiversity and ecosystem services, with the interaction between biodiversity values, natural vegetation and grazing, especially on the use of remote sensing technologies combined with field data, being one of the main fields of research.
	2. Your motivation to participate in the project and commitment: IST-ID joined the consortium due to its interest and research experience on the interaction of biodiversity assets, grazing practices and vegetation structure, functional diversity and composition, concerning landscape management and fire risk. IST-ID's role in the project will be of an academic partner, contributing with its knowledge on meaningful and practical vegetation biodiversity, functional diversity and structure indicators and metrics and the relation of grazing practices with these variables and indicators, and especially on the use of remote sensing technologies combined with field data to provide information for it. This knowledge results from IST-ID's considerable field experience with case studies resulting from academic and applied projects involving farmers, nature conservation associations and academic institutions.

3. Means to achieve your objectives:

IST-ID has a dedicated working group in the field of expertise of the project, with a senior researcher dedicated to the project coordination and a PhD student whose academic plan is in line with the project's objectives. IST-ID's project budget foresees hiring the necessary additional researchers for the project. IST-ID also has the necessary computational facilities to work with the software and models necessary for the project. Concerning the remote sensing equipment and results, IST-ID works closely with one of the Portuguese project partners (Terraprima) who provides this equipment and results in the context of joint projects.

4. Opportunity which appeared/appears:

SILVANUS is in line with the following projects managed by Terraprima and on which the scientific coordinator is the senior researcher referred above: GO-SILVPAST (funded by Portugal's Rural Development Plan) and providing services to Rewilding Europe, Associação Transumância e Natureza and ANP-WWF Portugal. All these projects involve studying the interaction between vegetation structure, composition and biodiversity and grazing, mostly in the context of wildfire prevention and/or involving the combination of remote sensing and field studies.

WHAT AND WHY

5. Exploitable assets and results:

The main exploitable assets of the project for IST-ID will be:

- The scientific knowledge arising from IST-ID's and other partner's work, specifically the fine tuning of meaningful indicators and variables to use in models (including the practicalities of their collection using remote sensing technologies)
- The scientific knowledge acquired on the management of grazing for fire prevention/restoration using vegetation functional biodiversity as a tool.

6. Rationale:

IST-ID is interested in incorporating the scientific and practical knowledge resulting from the project in further R&D, as a means of providing scientific support to the civil society in designing and implementing forest fire resilience and rehabilitation actions and plans.

7. Your Value Proposition towards Joint Exploitation of SILVANUS:

IST-ID expects other project partners to contribute with their knowledge of the relation between vegetation structure and composition, biodiversity and forest fire, and to give input and provide feedback on the proposed indicators, variables and methodologies used by IST-ID. The benefits IST-ID will deliver will be its knowledge on these issues and its experience of interacting with administration and civil society agents (farmers, electricity and water utilities, environmental NGOs, municipalities, etc.). Interest shared with other partners are the study of the interaction between vegetation biodiversity and structure with fire and grazing and the use of remote sensing technologies to study biodiversity variables.

ROADMAP WITH TIMELINE

8. Roadmap: the timeline plan you have for using those assets:

Product	1st sem 2022 (June)	2nd sem 2022 (Dec)	1st sem 2023 (June)	2nd sem 2023 (Dec)	1st sem 2024 (June)	2nd sem 2024 (Dec)	1st sem 2025 (June)	Beyond SILVANUS end
Forest landscape models for wildfire threat assessment (T2.3)								
Workshop to discuss forest models with stakeholders (if PT cluster is selected)			x					
Forest landscape management model (T2.3)								

Participation in PT cluster dissemination activities						x	x	
Publication/participation in scientific papers						x	x	x
Forest fire ignition models (T3.2)								
Participation in PT cluster dissemination activities						x	x	
Ecological resilience programme (T6.1)								
Participation in dissemination activities with AMIKON						x	x	
Publication/participation in scientific papers						x	x	
Large-scale demonstration activities of project outcomes (WP9)								
First open project workshop at Cova da Beira (in the Portuguese demo), involving local and national stakeholders				x				
Second open project workshop at Cova da Beira (in the Portuguese demo), involving local and national stakeholders								x

9. Measurement:

This impact will be measured using the following indicators:

- Number and relevance of stakeholders (municipalities, NGOs, international organizations, etc.) asking for IST-ID's scientific consultancy/advice on the implementation of forest resilience/recovery plans and/or monitoring variables;
- Number and relevance of scientific institutions contacting IST-ID for participation in scientific or applied projects;
- Number and relevance of scientific products (papers, etc.) resulting from research made during SILVANUS.

10. Positioning:

IST-ID's participation in the project will provide it with the following assets in relation to its equivalent organizations (research institutions):

- Increased knowledge on the most relevant indicators and variables relating vegetation structure and functional diversity with forest fire risk and grazing strategies;
- Increased knowledge on grazing management practices and their relation with vegetation structure and functional diversity and forest fire risk;
- Increased knowledge and experience on the combination of the use of remote sensing techniques and fieldwork to provide meaningful and practical indicators and variables to monitor forest fire risk related to grazing management, vegetation structure and functional diversity.

11.2.25 Partner No 29 - VELEUCILISTE VELIKA GORICA (UASVG)

QUESTIONS

PROFILE AND

1. Partner profile:

The University of Applied Sciences Velika Gorica is a Croatian higher education institution founded in 2003 with a mission to develop, modernize and implement specialized undergraduate and graduate professional study programmes in the areas of crisis management, optometry, information technologies, motor vehicle maintenance and aircraft engineering. The University is located in Velika Gorica near the capital city of Croatia, Zagreb. By providing Crisis Management undergraduate and graduate study programmes, as well as short specialized courses, the University became a proud national and regional centre of higher and lifelong education and Centre of Excellence in the field of Crisis/Disaster Management.

WHAT AND WHY

2. Your motivation to participate in the project and commitment:

UASVG is determined to develop the field of crisis management by implementing new practices, knowledge and skills. Given that the SILVANUS project deals with wildfire prevention, which is an important part of crisis management, this project shall significantly increase institutional, as well as staff competency of UASVG. The project shall also contribute to the widening of the UASVG professional network, which will result in creating new opportunities for our University. UASVG's contribution to the project will be apparent in the activities that deal with establishing environmentally sustainable, resilient forest models and assessment framework, as well as the culture of risk aversion against wildfire for sustainable forest management. Our key experts will also be involved in the Croatian pilot demonstration which will take place within the project. We believe that the development of SILVANUS models and framework and successful dissemination of the project outcomes will lead to the creation of a community that supports the final result - Integrated Technological and Information Platform for wildfire Management. At the same time, this will create a broad network of partners in the area of forest management and wildfire prevention. Dissemination of the project activities and results at conferences and other established communication channels will enable knowledge transfer which is crucial for the ultimate impact of the project.

3. Means to achieve your objectives:

The professional expertise and knowledge of UASVG staff, as well as our modern infrastructure and equipment, provide excellent preconditions for successful participation in the SILVANUS project activities. Apart from experts in the field of crisis management, the project activities will also be carried out by experts in the fields of environmental science and communications as well. The University is currently an active participant in 3 projects funded by the European Union and has successfully concluded participation in 5 major projects, one of which was Horizon2020. Apart from active participation in projects, the University also publishes the international scientific journal Annals of Disaster Risk Sciences (ADRS), which is the result of the successful organization of the international scientific conference Crisis Management Days. This annual conference gathers leading experts and scientists in the field of crisis management in order to explore all scientific fields that deal with various aspects of crises. The conference, as well as the scientific journal, can be a significant contribution to the overall dissemination strategies of the project.

4. Opportunity which appeared/appears:

The SILVANUS project is beneficial for UASVG from an academic perspective. Given that SILVANUS is a research project, its activities will lead to generating new knowledge and increasing UASVG's professional capacities. The quality and relevance of UASVG study programmes can only be guaranteed by continuous updates of the curricula of Crisis management undergraduate and graduate programmes in line with new trends and practices. Apart from the cooperation with Croatian institutions, EU-funded projects give the opportunity to broaden the knowledge and skillset on a European level. UASVG has participated in European projects e.g. RECIPE, EU-CIRCLE and DroneWISE that deal with various aspects of Crisis management such as the protection of critical infrastructure and public places. SILVANUS will enhance the knowledge within the scope of wildfire protection. With its international partners from Brazil, Indonesia and Australia, SILVANUS takes these opportunities for growth one step further and offers a global approach to tackling crisis management challenges.

5. Exploitable assets and results:

Given that UASVG will mostly be included in the activities of establishing environmentally sustainable, resilient forest models and assessment framework, as well as contributing to the culture of deterrence and prevention against wildfires based on sustainable forest management services, the most important deliverables are those from the work packages 2 and 3. The pilot demonstration in Croatia will also provide important results for implementation in the final result of the project - Integrated Technological and Information Platform for wildfire Management.

	6. Rationale: UASVG can contribute to the dissemination and knowledge transfer by means of our annual international scientific conference Crisis Management Days, as well as our scientific journal Annals of Disaster Risk Sciences (ADRS). It would be an excellent opportunity for enhancing international cooperation and reaching a broad audience of Crisis Management experts in order to distribute new findings and methodologies in forest management and wildfire protection, as well as to promote the newly built Integrated Technological and Information Platform for wildfire Management.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: UASVG can contribute to the project activities with its background in different focused areas such as crisis management, environmental science and communications, especially from Croatian and regional perspectives. All project partners are expected to contribute with their respective expertise, which can result in forming new partnerships and project opportunities. It would be especially beneficial for project partners to attend our yearly conference Crisis Management Days where SILVANUS can be presented and discussed.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** Results and activities of the SILVANUS project will be presented at the yearly conference Crisis Management Days. All relevant achievements will be promoted through UASVG's social media channels, as well as our website and our non-scientific magazine Gaudeamus. It is important to note that participation in the SILVANUS project activities will significantly strengthen UASVG's portfolio. Given that the SILVANUS consortium consists of many industrial partners, SME organizations, academic/research partners, international partners, as well as stakeholders, UASVG's professional network will incredibly benefit from the diversity of SILVANUS project partners. Therefore, successful implementation of project activities will potentially lead to forming new partnerships for future project opportunities and applications.
	9. Measurement: The main measures for the implementation of our exploitation plan include the number of publications regarding SILVANUS project activities and results, as well as the number of attended events where SILVANUS was promoted.
	10. Positioning: Not applicable.

11.2.26 Partner No 31 - POMPIERS DE L'URGENCE INTERNATIONALE (PUI)

	QUESTIONS
PROFILE AND	**1. Partner profile:** POMPIERS DE L'URGENCE INTERNATIONALE (International Emergency Firefighters) is an international solidarity association (NGO), based in Limoges, France, dedicated to: • Provide rescue assistance and aid to vulnerable populations in need after a natural disaster through the involvement of volunteer rescuers, • Strengthen civil protection mechanisms in emerging countries :

	• Develop a risk-assessment culture to raise public awareness to natural risks through situational exercises using an innovative equipment, specialised training and public events.
	2. Your motivation to participate in the project and commitment: PUI has an international character made up of professionals rescuers with a strong international experience in crisis situations. All NGO members intervene on a voluntary basis and can be swiftly mobilised to act effectively. Our skills include: • Emergency earthquake response with personnel specialists in search and rescue, detecting and locating buried victims by means of dog-handler teams and electronic devices. • Medical and paramedical care of victims of natural disasters. • Humanitarian and logistical support. • Distribution of drinking water. • Certification of trainers and intervening actors in the civil protection's areas of expertise: first aid, search and rescue, disaster search dog-handling, technological risks and CBRN, fire prevention, operational forecasting, forest fires. • Full operational coordination capacity and professional expertise (decision support). • Formulation of specific projects consistent with the institutional procedures. • Technical support to help national leaders manage the influx of international means. PUI France is engaged as first responders' expert in the project using its uinque expertise.
	3. Means to achieve your objectives: PUI has all the necessary background, the resources and the specific infrastructure in order to contribute to the project's implementation successfully. The site of test for SILVANUS is a real site near a SEVESO exploitation for explosives, the risk of forest fire and the spread to the site is very high and dangerous. The site can be easily accessed using various means of transportation. The scenario of the simulation will integrate the spread of the fire from the road to the factory SEVESO, and the need to anticipate and evacuate the population near the site. The different public services will be involved for the crisis management: police, firefighters, municipality, and governmental authorities.
	4. Opportunity which appeared/appears: PUI's participation to the project is the result of the real life needs. When the project finishes, PUI will have gained great experience and know-how and will be able to use it inside the organization. Our objective is to be able to give prevention advice and recommendations to the population and to the authorities in charge of operations; PUI wishes to become a reference in this field.
WHAT AND WHY	**5. Exploitable assets and results:** PUI France will use the whole system and its components to its international network (& INSARAG TEAMS). The expertise gained during the project might be used in further development of such systems within the organisation. The expertise gained during the project on state-of-the-art systems, tools and technologies as well as standards may be exploited in new research and development projects. PUI FRANCE is also going to use the product during his deployment in case of forest fires beside the partners in different countries : Greece, Peru, Italy, Indonesia, Philippines…we have a agreement with this countries to deploy first responders of PUI beside these countries.
	6. Rationale: PUI is very interested in the work of the SILVANUS project because as first responders, we intervene in the fight against forest fires but also we work in the field of prevention. The results of the project will be used to improve the conditions of intervention of first responders but also to share with the authorities in charge

	of fire prevention and crisis management: mayors, prefects, loggers, farmers... We have also planned to share with the population in order to raise their awareness and change their behavior with regard to the risk of fire and its consequences.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: PUI's expectations is based on the coordination and collaboration between the partners and the exchange of know-how gained mainly by the other end users who participate in the project. The most important values for PUI are those concerning the prevention of forest fires: it is very important that forest operators and elected officials take steps to prevent a fire from starting and developing: the maintenance of the forest , monitoring by sensors and cameras, the layout of access are very important elements.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** PUI's concrete actions towards the joint exploitation plans can be presented to the Consortium any time. PUI has already started communicating SILVANUS innovations : we have planned to present to the elected representatives of the communes, and forest owners, the innovative devices to protect and monitor the forest; in France, 75% of forests belong to private owners.
	9. Measurement: The impact will be measured through the various means that PUI uses. The rate of equipment of the forest massifs in equipment or the number of downloads of applications for the population, will be criteria which will make it possible to measure the impact of the project.
	10. Positioning: SILVANUS is a unique and innovative project so there is no competition in France. There are no similar products in France, currently no device is installed and no innovation makes it possible to prevent, fight and reforest after fire.

11.2.27 Partner No 32 - THE MAIN SCHOOL OF FIRE SERVICE (SGSP)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** SGSP is a one in Poland and one of the few state technical-social academies in the world, which trains fire officers and educates specialists in fire safety, civil safety engineering and internal security. SGSP reports to and is scientifically and educationally supervised by the Minister of Interior and Administration. It has full academic rights and constitutes an organizational unit of the State Fire Service (PSP). SGSP, as a technical-social academy, provides studies on the Faculty of Safety Engineering and Civil Protection. The studies curricula include a very broad range of specialized theoretical and practical subjects and trainings. SGSP offers two types of classes: day and extramural, both of the same academic character. Graduates can obtain either bachelor's (Fire Engineer, Fire Safety Engineer, Civil Safety Engineer, Bachelor in Internal Security), master's degree (Master of Engineering in Fire Protection, Master of Engineering in Civil Protection, Master in Internal Security) or doctoral degrees (PhD in Environment Engineering, PhD in security studies). SGSP, as PSP organizational unit, takes part in rescue and humanitarian actions. SGSP Fire-fighting-Rescue Unit protects Żoliborz District in Warsaw (Poland) and is dedicated to support all huge national actions in Poland (e.g. wildfire in Kuźnia Raciborska in 1992, floods in 1997, 2001 and 2010, evacuation of Polish personnel from Kuwait, The World's Youths Days 2016). Accordingly to scientific, operational and educational character, SGSP carries out object ventures (projects, conferences, trainings,

	studies) in rescue, fire protection, civil protection, critical infrastructure protection, internal security, occupational safety and health, crisis management and crisis communication. SGSP representatives serve as experts in NATO, EU as well as in national scientific and rescue institutions.
	2. Your motivation to participate in the project and commitment: SGSP joined the consortium to contribute to the project its research output and operational experiences and, on the other hand, to familiarize with best practices and new solutions (operational, technical etc.) in wildfire management and wildfire risk reduction. The project covers directly one of the academy area of interest – wildfires. SGSP is not only academy, but also organizational unit of the State Fire Service. This is why the project ascribes widely into its domain of activities when research, teaching and emergency response are concerned. To maximize positive impact on the project, SGSP plays a role of end-user.
	3. Means to achieve your objectives: SGSP established project team comprising in its workers and officers. They are academic teachers with wildfire background in fire safety engineering, security studies and environmental engineering as well as supporting personnel. The team has direct access to all academy stakeholders who are related to wildfires (emergency services, forest services, technology providers etc.). Furthermore, SGSP team is supported by such academy organizational units as Projects Department, Legal Department, Accounting Department, Internal Security Institute, Safety Engineering Institute, Faculty of Safety Engineering and Civil Protection and Firefighting Rescue Unit of SGSP.
	4. Opportunity which appeared/appears: Project will give a new and ordered knowledge (from public deliverables and SGSP research results) about wildfire management to be directly transferred to educational processes (studies, post-graduate studies and courses for firefighters, public administration etc.), to firefighting units which operate in terms of wildfires in Poland. Furthermore, it is relevant opportunity to check SGSP research output (from projects related to disaster risk reduction, crisis management and new technologies in security) in practice, implement and evaluate them. SGSP assumes to use SILVANUS project results to design new ideas for projects and other research initiatives. Consequently, participation in the project is a derivative of internal development needs. SILVANUS is not a continuation of any SGSP project, but other projects are expected to be sources of information, good practices and inspirations to support SILVANUS in a line of SGSP research development.
WHAT AND WHY	**5. Exploitable assets and results:** From SGSP point of view, following exploitable assets and results are expected: a) D2.1, D2.2, D2.3, D2.4, D2.5. b) D3.2, D3.3, D3.4, D3.5. c) D6.1, D6.5. d) D7.3. e) D9.2, D9.4, Pilot outcome assessment and replicability studies (T9.6). f) T10.3.
	6. Rationale: These assets (mainly public project deliverables) characterize high potential to be effectively implemented in SGSP educational processes (to be presented during classes), research (to be presented during internal meetings with academic teachers) and operational activities (to be handed over to operational firefighters).

	7. Your Value Proposition towards Joint Exploitation of SILVANUS: SGSP has no expectations from project partners as it is self-sufficient in above-mentioned exploitation processes. The academy serves its knowledge from a unique connection of theory and practice to other partners (SGSP is much academic-related end-user) as well as shares interest to continue research and development in the topic of wildfire risk reduction and wildfire management in next projects with this consortium.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** Particular deliverables will be handed over to relevant academy organizational units as soon they release (according to general timeline in the project). Educational processes will be carried out by the Faculty of Safety Engineering and Civil Protection. Research issues will be handled by the Internal Security Institute and the Safety Engineering Institute. Operational aspects will be conducted by Firefighting Rescue Unit of SGSP.
	9. Measurement: Regarding to research processes: number of academic teachers informed about the assets, number of symposiums/seminars/conferences organized due to the project, number of papers/chapters in books prepared due to the project. Regarding to operational processes: number of stakeholders to whom the assets will be handed over.
	10. Positioning: None.

11.2.28 Partner No 34 - LETS ITALIA SRLS (LETS)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** Founded in 2017, as a natural evolution of the 30-year history of a Group of Engineers and professionals based in Modena and operating throughout Italy, LETS (registered trademark LETS Italia) is a limited liability company that provides support to companies in the fields of engineering design, fire prevention, training and safety at work, assessment of the dangerousness of environments and coordination in the management of toxic gases (ammonia, cyanides, sulphur dioxide, petrol, chlorine, ethylene oxide). In addition, considering the fact that the company's technical/operational staff has a great deal of experience in the world of medical rescue, an important support service has been developed for companies with regard to assistance and rescue in confined environments. By virtue of these specialisations, over the years, collaborations have been established and continue today with the National Fire Brigade Corps, some departments of the Italian Army on NBCR management, explosive substance assessments, joint training
	2. Your motivation to participate in the project and commitment: Italia has joined the Silvanus project in order to improve its corporate curriculum and gain new knowledge in the field of forest fire fighting. Moreover, by entering the world of European projects it accepted an important growth challenge, aimed at demonstrating the concreteness and professionalism that have always distinguished the work of LETS.

	3. Means to achieve your objectives: Implementation within the company staff of a system to ensure the achievement of the Silvanus Consortium's objectives, through continuous dialogue between staff working on the project and the recruitment of dedicated research staff.
	4. Opportunity which appeared/appears: The leadership assumed in task 10.5 allows the company to develop new knowledge in terms of access to standards and comparison with others. This ensures that this growth can be spent on future new projects or in the professional field.
WHAT AND WHY	**5. Exploitable assets and results:** LETS's position within the Consortium allows it to gain from this experience new knowledge in the areas of fire prevention, firefighting, post-fire interventions and regulations. This ensures that these skills can be reinvested in business consulting and relations with public institutions. It also generates a methodological approach for participation in new projects.
	6. Rationale: The knowledge and methodologies acquired within the project will enable LETS to improve the scope of expertise in its market and offer a wider range of services. This is also due to existing partnerships with emergency management bodies.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: Considering that within the Silvanus Consortium most of the partners are not directly involved in the management of fire-fighting practices, LETS Italia is fully available for the organisation of initiatives that can guarantee the reliability of the tools developed by Silvanus (training of rescuers, management of fire-fighting equipment and organisation of resources in the emergency phase, field simulations of the reliability of the equipment, etc.).
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** LETS will use the knowledge developed within the framework of task 10.5 and the information gained in the collaboration within other tasks to expand its service offering and to propose itself in new projects developed at European level in the field of security.
	9. Measurement: The impact of Silvanus within the LETS workforce will be evaluated at the end of the project by cross-referencing the organisation's new knowledge with the market's interest in the same
	10. Positioning: N.A.

11.2.29 Partner No 37 - ASOCIATIA FORESTIERILOR DIN ROMANIA ASFOR (ASFOR)

	QUESTIONS
PROFIL	**1. Partner profile:**

ASFOR is a professional, non-governmental association consisting of economic agents active in the fields of forestry, wood processing, and forest owners that represents, promotes, and supports the economic, legal, and social interests of its members, both nationwide and on an international level. Having a strong network in the field of forest management and related institutions, including the Ministry of Environment, Waters, and Forests of Romania, and having long experience in working in multi-disciplinary groups with national and European organisations (FAO, EOS, CEETTAR), ASFOR leads the Romanian pilot demonstration of the SILVANUS project.

2. Your motivation to participate in the project and commitment:

ASFOR is willing to find solutions to technologize the wood industry and, at the same time, to preserve the Romanian forests, which are affected by poor infrastructure, which makes it difficult to prevent and combat the ignition and spread of forest fires. Briefly, ASFOR's contribution to the project resides in the following activities:

- Ensuring project management at ASFOR level, including technical and financial reports
- Support in the realization of the modeling for the assessment of the fire danger in the forest for the Romanian pilot
- Support in the adoption of the evaluation methodology and its application in the Romanian pilot
- Support in the development of forest fire prevention procedures
- Support in the development of models for the restoration of the forest fund after fires
- ASFOR is the Leader of WP9
    - Leader T9.1 - Organizational readiness for pilot demonstration
    - Leader T9.3 - Phase B Trials
- Ensuring the dissemination of information about the results of the project and the construction of the online community

3. Means to achieve your objectives:

During the years, ASFOR has developed a strong network with the state institutions responsible for forest protection, including inspectorates for emergency situations in the country. ASFOR has received the permits to deploy the pilot in "Rodna" Mountains National Park. ASFOR works closely with the Romanian partners involved in the project by holding regular meetings and monitoring the achievement of the SILVANUS objectives.

4. Opportunity which appeared/appears:

The experience gained during the implementation of the SILVANUS project is an important asset for ASFOR which is involved in another project- TREEADS where a similar pilot will be deployed but in a different geographical area, with other features (different climate, different scenario, etc.)

WHAT AND WHY

5. Exploitable assets and results:

- Fire detection from IoT devices
- AR/VR training toolkit
- Awareness campaigns for reducing human negligence and forest fire incidence.
- Fire detection from IoT devices to improve the firefighter’s response time and operational capacity.

6. Rationale:

The assets presented above tackle the vulnerabilities of the infrastructure for extinguishing fires with which the teams from the inspectorates for emergency situations are equipped: lack of tools for fire detection, delayed response time, and operational capacity. Bringing new technologies and solutions for the prevention of forest fires will encourage the authorities to invest in updating the actual intervention tools with new capabilities.

	7. Your Value Proposition towards Joint Exploitation of SILVANUS: For ASFOR, the pilot demonstration is the climax of the project, so the objectives for the pilot demonstration are to test, train on, validate, and evaluate the SILVANUS technological platform and its components. Besides the AR/VR training module, training of firefighters and forest rangers for the intervention scenario, and testing and validation of the monitoring system, the simulation of an intervention in a forest fire at the pilot site will be followed by the test and validation of SILVANUS technology. In this scenario, ASFOR is expecting the technological partner (SIMAVI) to get the best results. Clear and specific training of the firefighters and the rangers regarding the SILVANUS project and technology is expected in order to prepare the stakeholders for the simulation of intervention in the case of a forest fire. For completing this objective, ASFOR is expecting full involvement from the SMURD Foundation.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** On September 14–15, 2023, ASFOR and SIMAVI will organize a workshop in the pilot area to present the methodology, some products realized by the technical team, how the modelling was done, demos, and a visit to the "Rodna" Mountains National Park. Before the workshop, there will be a meeting with the firefighters to determine the steps for each role in case of a fire and how they synchronize with the others (rangers, the person responsible for lifting the drone, etc.). We need to establish the flow and the responsibilities of each entity involved in extinguishing a fire. After this workshop, the partners will optimize the assets to be able to deploy the pilot demonstration next year.
	9. Measurement: N/A
	10. Positioning: N/A

11.2.30 Partner No 38 - KENTRO MELETON ASFALEIAS (KEMEA)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** The **Center for Security Studies (Kentro Meleton Asfaleias – KEMEA)**, founded in 2005 by Law 3387 of Greece, is a scientific, consulting and research organization overseen by the Minister of Citizen Protection, governed by common law and annually audited by chartered accountants. Its **principal purpose is to conduct theoretical and applied research and studies, particularly at strategic level, on security topics and policies**. Moreover, it is **the think-tank of the Ministry of Citizen Protection** on numerous policies such as public order, correctional services, terrorism prevention, crime prevention, integrated border management and **civil protection** as well as on various other security and societal issues; it also provides advisory and consulting risk-management services to an array of public and private organizations in Greece and in Europe. Moreover, pursuant to the provisions of Council Directive 2008/114/EC on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection, and by a Presidential Decree of 2011 (Nr. 39 of 6.5.2011) KEMEA is the **nationally designated European Critical Infrastructure Protection (ECIP) Contact Point**, responsible to coordinate ECIP issues domestically, as well as with other Member States and the European Commission. In addition, KEMEA conducts various trainings for first responders, civil protection authorities and public administration.

Finally, KEMEA is represented and participates actively in the deliberations of the governing bodies of EOS, ECSO, EARTO, ESDC; it has been also a CEPOL partner since 2016 and, since 2019 the designated focal point between the Hellenic Police and the European Border & Coast Guard Agency (Frontex) on Research and Innovation matters. Currently, KEMEA is considered a key player in the EU Research, Development and Innovation community.

2. Your motivation to participate in the project and commitment:

KEMEA has participated in research projects of the Horizon 2020 – the Research and Innovation Framework Programme of the European Commission – ever since it was launched and especially to security cluster "Secure Societies – Protecting freedom and security of Europe and its citizens". KEMEA's objective is not only the development of new technologies or the application of emerging technologies, but also the understanding of associated phenomena and the development of more effective policies. Currently, Disaster Resilient Societies calls as well as similar to natural disaster and resilience such as the Green Deal calls are of the utmost significance of KEMEA.

Disaster management is one of the most significant topics that KEMEA monitors and provides constant consultation.

Moreover, the climate change and its continuous evolution force to be continuously updated in related issues such wildfires and forest management, in order to transfer knowledge, best practices and latest technologies for prevention, response and restoration to all levels of public administration, first responders, standardization organizations and academic institutes.

In SILVANUS, KEMEA has a scientific, supervisory and consulting role. The most significant tasks are mentioned below:

- Ethics leader and chair of the Ethics External Advisory Board
- Data management leader
- Leader of Task 6.5 – Privacy and societal impact assessment
- Leader of Task 6.6 – Contribution to EU legal framework for climate-related risks
- Leader of Task 7.4 – Policy recommendations for sustainable and resilient forest management services.
- WP9 tasks related to the pilot areas and demonstrations of technologies and evaluation.
- Task 3.5 for citizen engagement.
- Task 4.6 for the use of UAVs.
- Other tasks in order to keep a general monitoring that supports the project progress.

3. Means to achieve your objectives:

SILVANUS project has been assigned to the Emergency Management and Civil Protection Sector and the subsequent personnel.

The KEMEA team assigned to SILVANUS has a long experience in project management and in similar tasks and comprises of high-level scientists in various fields such as forestry, natural hazards risk assessment and citizen engagement, GIS, legal and ethics experts, policy making, professional firefighters and volunteers.

All personnel have dedicated offices and the necessary equipment for their daily work as well as access to more sophisticated equipment such as latest drones (UAVs) and the Operational Center Simulation Infrastructure and GIS systems which can be used for simple cartographic works, risk assessment, modelling and simulation as well as visualization. In addition, if needed servers and other similar equipment can be allocated for the pilots and daily tasks of SILVANUS.

4. Opportunity which appeared/appears:

The participation of KEMEA in SILVANUS is the result of its role as a think tank of the Ministry Protection as well as its continuation of other projects, know-how reuse and knowledge exchange. KEMEA participates in the FIRE-IN project (network), a network of practitioners, academics and industry with the

aim to make Europe safer for its citizen examining search and rescue, structure fires, landscape fires, natural hazards and CBRNE topics, providing practitioners' challenges, solutions for the challenges and recommendations to the EU. Moreover, KEMEA coordinates the MEDEA project, a network of practitioners of the Mediterranean and Black Sea Region in four thematic areas – natural hazards, border security, fight crime and terrorism and migration and asylum – providing capability gaps and identifying innovative solutions.

In addition, currently KEMEA participates in the pre-standardization project for crisis management STRATEGY with the proposition of two CEN Workshop Agreements and the participation to at least other three – one of them directly related to wildfire response, the citizen oriented project RISKPACC designed to increase risk perception and boost the interaction between civil protection authorities and citizens, the FirEUrisk project in which wildfires are studied in detail in order to reduce wildfire risk, enhance resilience. FirEUrisk examines wildfire hazard and risk, conducts risk assessment, studied climate change as well as socioeconomic changes and builds on EU and national policies. Finally, KEMEA participates as well, in FIRELOGUE, the CSA of Green Deal for preventing wildfires, as the infrastructure Working Group leader due to its role as the national contact point for European Critical Infrastructures in Greece and the connection to European and national infrastructures.

In addition, KEMEA has built and authored the National Risk Assessment of Greece on behalf of the General Secretariat for Civil Protection of Greece (GSCP-GR), has developed a technical-economic study for emergency sheltering in Greece on behalf of GSCP-GR and funded from the Council of Europe.

In total, the last 10 years KEMEA has participated in 30 projects related to civil protection and emergencies.

WHAT AND WHY

5. Exploitable assets and results:

The most interesting exploitable assets and results, in terms of deliverables, are the following:

- WP2 deliverables
- WP3 deliverables
- D4.4 and D4.5
- WP6 deliverables
- WP7 deliverables
- WP9 deliverables
- D10.5 and D10.7
- Final platform

6. Rationale:

The above-mentioned results are going to be exploited mainly for policy purposes, consulting services, further research and development, potential standardization and in general in a more academic aspect than industrial one. Platform related deliverables may be exploited to be proposed to other projects depending on the contribution to the final product. Also, the final product can potentially be proposed for use by Greek authorities.

All results provide an added value in terms of strengthening the expertise of KEMEA and its role as a think tank and consulting body. They will be used for training, for knowledge exchange and promotion of know-how, best practices and innovation for national related tasks (all levels), European and international ones.

7. Your Value Proposition towards Joint Exploitation of SILVANUS:

- Respectful cooperation and collaboration
- Continuation of research to the wildfires topic (risk reduction, citizen engagement, policies)
- Building policies
- Exchange of knowledge
- Common interests on wildfires preparedness, training both for citizens and responders
- Interest on technological innovations related to wildfires and natural hazards in general

ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** Preliminary results will be used for inclusion and strengthening of portfolio of KEMEA. Strengthening of collaboration between project partners, especially with those that it is the first time we collaborate. Results are stored in KEMEA databases. Public results, especially, are used also for dissemination purposes and strengthening of the relations with local, regional and national stakeholders as well as European ones. One publication related to policy recommendations and trends related to sustainable forest management and wildfires around M22-26. For M22-M30 project and preliminary results will also be used for recommendations to the Greek state on preventing, responding and recovering/mitigating from wildfires.
	9. Measurement: Results used: - in training activities, - in presentation to competent authorities (national and local ones in Greece) - in alterations to existing laws, directives or introduction of news laws related to prevention, preparedness, response and restoration due to wildfires. - New projects (EU or national).
	10. Positioning: None. Most probably not applicable for KEMEA.

11.2.31 Partner No 39 - ELLINIKI OMADA DIASOSIS SOMATEIO (HRT)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** Hellenic Rescue Team (HRT) is a volunteer non-profit Search and Rescue (SAR) organization with a human potential of 2.000 volunteers all over Greece and Headquarters in Thessaloniki. HRT participates in SAR missions in cases of urgent needs and massive disasters, either in Greece or abroad. It is acknowledged by Civil Protection Authorities in Greece and EU and the only Greek member in the International Maritime Rescue Federation (IMRF) and the International Commission for Alpine Rescue (ICAR/CISA). Within the Hellenic Rescue Team, there are seven specialized departments, mainly: • USAR- Massive Disasters • Mountain Rescue • Water Search and Rescue • Rescue Dogs • First Aid • Research, Technology and Telecommunications • Humanitarian Missions • Training

2. Your motivation to participate in the project and commitment:

Forest fires have emerged as one of the most devasting environmental catastrophes of our time. The immense scale of the problem necessitates collaborative action and innovative solutions, making SILVANUS project an important asset hope in the fight against forest fires.

Below are the key reasons we are motivated to participate in this project:

- Preventing human and environmental tragedies
- Protecting biodiversity and ecosystems
- Mitigating Climate Change Impacts
- Empowering local communities

We pledge to bring our expertise, resources, and dedication to the project, working collaboratively with all partners and stakeholders to achieve tangible results. We aim to contribute with our knowledge in forest management, community engagement, awareness campaigns, and policy advocacy to ensure a comprehensive and sustainable approach to tackling forest fires.

3. Means to achieve your objectives:

HRT is an experienced Search and Rescue organization with a track record of several Search and Rescue operations in various disciplines and many occurrences pertinent to the project's basic notion.

Furthermore, over the last five years, HRT has engaged in several research projects in which HRT played similar responsibilities to the respective project: requirement definition and field testing.

Finally, in terms of infrastructure, the HRT has the following, among others:

- A van which serves as a mobile operations center called ''Hermes'', which carries all necessary equipment for managing a crisis, such as a communication center, internet connection, satellite communication, etc.
- Suitable suits and fire-fighting equipment
- Various first aid and SAR equipment
- Nationwide communication network
- 2 Mobile Wi-Fi communication antennas

4. Opportunity which appeared/appears:

Hellenic Rescue Team (HRT) is very interested in capitalizing the results of the project and incorporating the developed technologies in our SAR and day-to-day operations. We firmly believe that the project's outcomes will improve and strengthen our role, as well as our ability to offer a quicker and more effective response during an emergency incident.

Some potential opportunities we envision:

- Knowledge Sharing and Capacity building
- Sustainable Forest Management
- Collaborative partnerships
- Public Awareness and Education

WHAT AND WHY

5. Exploitable assets and results:

The most interesting exploitable assets and results, in terms of deliverables, are the following:

- WP2 Deliverables
- WP3 Deliverables
- WP6 Deliverables
- WP7 Deliverables
- WP9 Deliverables
- Final platform

	6. Rationale: The above-mentioned results are going to be exploited mainly for operational and policy purposes, further research and development and potential standardization. Platform-related deliverables may be used to propose to other projects based on their contribution to the final product. Furthermore, the final product could be proposed for usage by Greek authorities. All of the outcomes contribute to HRT's expertise and role as a volunteer SAR organization. They will be utilized for training, knowledge sharing, and the promotion of know-how, best practices, and innovation for national, European, and international tasks.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: ▪ Effective cooperation and collaboration ▪ Knowledge exchange ▪ Community and citizen engagement ▪ Continuation of research to the wildfire's topics
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** ▪ Public results are used also for dissemination purposes and strengthening of the relation with local, regional, and national stakeholders as well as European ones. ▪ Progress and results are stored in HRT databases and presented to the Board of Directors. ▪ Results will be used for inclusion and strengthening of portfolio of HRT.
	9. Measurement: Results used for the following: 1. Training activities 2. Presentation to respective authorities 3. New projects (National or EU)
	10. Positioning: N/A

11.2.32 Partner No 42 - PERIFEREIA STEREAS ELLADAS (PSTE)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** The Region of Central Greece (PSTE) is one of the 13 administrative regions of Greece, it occupies the eastern half of the traditional region of Central Greece, including the islands of Euboea and Skyros, its capital city is Lamia and to the south it borders the region of Attica. Central Greece is the most populous geographical region of Greece, with a population of 4,591,568 people, and covers an area of 24,818.3 km2 (9,582.4 sq mi), making it the second largest of the country. Its climate is temperate along its coastlines, and dry in the interior. The region is one of the most mountainous in Greece, having some of the highest elevations in the country. The GDP was 8.8 billion € in 2018, accounting for 4.7% of the Greek economic output. GDP per capita adjusted for purchasing power was 18,900 € or 63% of the EU27 average in the same year. The GDP per employee was 81% of the EU average. Central Greece is the region in Greece with the fourth highest GDP per capita. The PSTE implements the strategy "Smart Region", supported by the services of regional government, initiatives and citizens. The aim of the strategy is to introduce innovative ideas and practices in governance, transparency, economy, social solidarity, environment, culture and to give citizens a platform for participation. The Region of Central Greece has also appointed an Authorized Regional Advisor for Innovation, New Technologies and Digital Governance and a Deputy Governor for

	Agriculture & Rural Development. Finally, the PSTE has been a participant to a number of EU funded program in its effort to make rural life attractive to young people as permanent residents while it is worth noting the creation of the Agrofood S.A. -a regional farmer's hub for the substantial strengthening of the local produce- and the establishment of the Business Support Center (KYE) of PSTE, which functions as liaison and coordination support body for every entrepreneur of Central Greece (small, large, candidate).
	2. Your motivation to participate in the project and commitment: Ensuring the protection of the natural environment and making it a pillar of development, through a sustainable management strategy, are a key priority of the Region of Central Greece.The consequences of climate change are becoming more felt, creating chain reactions with negative effects on both the natural and socio-economic environment. The Region of Central Greece due to its special characteristics is strongly threatened by climate change, with an increase in the frequency and intensity of extreme phenomena such as heat waves, drought, fires, heavy rains & snowfalls. Biodiversity, ecosystems and, in general, wetlands and protected areas are also vulnerable to the above phenomena, while a particular problem is created in forests by the increased risk of forest fires. During the summer months, very high temperatures develop in the area with the result that there is a great risk of fires. The motivation for the Region's participation in the SILVANUS project is to create the framework where there will be prevention, treatment of fires, proper information to the citizens and restoration of burned areas. Areas of Central Greece, and especially Evia, experience fires every summer, a fact that makes coordinated action imperative for their management. PSTE will be acting as the main stakeholder in the Greek case study. Throughout the project, PSTE will provide its operational capacity and administrative power for the identification of current and forthcoming pressures and challenges for the relevant territory, the definition of all sectors and policies relevant to the territory, the documentation of key biophysical, social and economic features of these policies and finally their integration and interconnection into a cohesive and cross-sectoral intervention strategy. Moreover, the Region will mobilize its vast networking capabilities to engage local communities, support horizontally the case study and provide the connecting nodes for all stakeholders of the value chain to provide their contribution.
	3. Means to achieve your objectives: PSTE has the necessary human resources, specialized scientifically trained staff, the hardware and software to carry out research, development and innovation projects (such as tablets and smartphones that are available for testing applications on different devices, workstations, servers that allow rapid and reliable testing of the prototypes developed within the project).In addition, PSTE owns or has direct access to conference facilities and conference rooms to accommodate publicity and dissemination events, mentoring sessions, workshops and conferences.
	4. Opportunity which appeared/appears: Participation in the SILVANUS project is the result of a real need that exists as in the Region of Central Greece every year there are many fires that create major problems in the physical and socio-economic environment. Through SILVANUS, the know-how will be acquired for the effective treatment of fires both by the state agencies and by the active participation and information of the citizens. In particular, the competent bodies (fire department, police, etc.) will have the knowledge to prevent and deal with fires, but also the citizens will be activated to inform immediately in the event of a fire, they will know the ways of escape and in fact they will help the competent authorities.
WHAT AND WHY	**5. Exploitable assets and results:** After proving the value and effectiveness of the proposed platform and services at local level, PSTE will seek to deploy them in additional geographic areas within its region. Moreover, through its Business Support Center (KYE), PSTE will provide support to entrepreneurs of Central Greece for contributing into the ecosystem of the project with more added-value products and services. Also, PSTE will exploit the policy recommendations reached through the project to enhance its environmental resilience strategy. Finally, PSTE will exploit the lessons

	learned in the pilots of the project for its future procurement actions and calls for tenders when it comes to forest management and environmental resilience.
	6. Rationale: The knowledge that the Region of Sterea Hellas will gain from the project will also be used in other areas with a high risk of fire. The knowledge gained could also be disseminated to universities in order to develop innovative fire prevention and suppression systems as well as to inform citizens.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: Through the SILVANUS project, experience and know-how will be gained for fire management. With the partners of the project there will be an interaction where we will share the strong and weak points of the process and the possibilities for improvement. We expect the partners to share their experience from the implementation of the project as each region is unique. Specifically, to convey to us what procedures they followed and if they had any innovations that we could also apply.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** Based in the Roadmap section of the Grant Agreement, we should outline the specific timeline plan for utilizing the assets granted to us. Here is an example of how we can structure the roadmap, including concrete actions for months M22-M30 and beyond: Roadmap: M22: - we conduct a meeting with the project team to review the assets received from the Silvanus Foundation. - Develop a comprehensive plan for the utilization of the assets based on the project's objectives and needs. - We will Identify specific milestones and deliverables for the upcoming months. M23: - We initiate discussions with the board of directors to present the assets and seek their input and approval. - We identify potential stakeholders and partners who could benefit from the assets, such as local communities, environmental organizations, or educational institutions. - We begin preparations for the inclusion of the assets in the organization's portfolio or promotional materials. M24: - Collaborate with the board of directors to finalize the utilization plan for the assets. - We organize a presentation or workshop with the board and other key stakeholders to showcase the assets and their potential impact. - We develop a communication strategy to raise awareness about the assets and their benefits among the target audience. M25-M27: - Implement the utilization plan by deploying the assets to the identified beneficiaries or incorporating them into relevant projects. - Monitor and evaluate the impact of the assets on the intended recipients and the overall project objectives. - We regularly communicate progress and outcomes to the Silvanus Foundation through progress reports and financial statements. M28-M30: - We will assess the effectiveness of the assets in achieving the desired outcomes and adjust the implementation plan if necessary.

- We will seek opportunities to share success stories or case studies related to the assets with the Silvanus Foundation and other stakeholders.
- We will explore potential collaborations or partnerships based on the positive outcomes and lessons learned from utilizing the assets.

Post-Project:
- We will ensure the sustainability of the assets beyond the grant period by integrating them into the organization's long-term strategy or operational plans.
- We will continuously leverage the assets to support ongoing initiatives, expand outreach efforts, or contribute to future projects aligned with the organization's mission.
- We will look forward to maintain a positive relationship with the Silvanus Foundation, providing updates on the continued impact of the assets and expressing gratitude for their support.

Note: The specific actions and timeline in the roadmap should be tailored to our project and organization's needs, and may vary based on the nature of the assets provided by the Silvanus Foundation.

9. Measurement:

The measurement of impact for the last year of the project can be approached as follows:

1. Key Performance Indicators (KPIs): We define specific KPIs that align with the objectives of the project. These may include indicators related to regional development, economic growth, employment rates, infrastructure development, environmental sustainability, or any other relevant metrics determined in the project plan.

2. Data Collection: We will collect relevant data and information pertaining to the defined KPIs. This can involve gathering statistical data, conducting surveys or interviews, and obtaining reports or documentation from relevant stakeholders.

3. Monitoring and Evaluation: We will establish a monitoring and evaluation framework to track progress and assess the impact of the project. We will regularly review and analyze the collected data against the predefined KPIs to measure the project's performance and outcomes.

4. Stakeholder Feedback: We will engage with stakeholders involved in the project, including local communities, businesses, government entities, and NGOs. We will seek their feedback through surveys, focus groups, or consultation meetings to gather insights on the perceived impact of the project on the region.

5. Comparative Analysis: Conduct a comparative analysis to benchmark the project's performance against similar initiatives or regional development standards. This analysis can provide valuable insights into the project's effectiveness and identify areas for improvement.

6. Reporting: We will prepare comprehensive reports documenting the measured impact of the project for the last year. These reports should present the findings, achievements, challenges encountered, and lessons learned. They can serve as a valuable resource for future planning and decision-making.

By employing these measurement strategies, we can effectively assess the impact of the project involving PSTE (PERIFEREIA STEREAS ELLADAS). It is important to ensure that the data collected and the evaluation methods used are reliable and align with the specific goals and objectives of the project.

10. Positioning:

Although we don't have specific information about the asset in question, here is a general approach to positioning:

	To note in addition that being a state agency we are not subject to any form of competition and that the benefits deriving from this partnership are intended for the common interest of the state and not of any private individual or business with proprietary rights. 1. Unique Technological Advantages: We showcase the unique technological capabilities or innovations that set our asset apart from competitors or alternatives. 2. Enhanced Performance: We emphasize how our asset delivers superior performance compared to competitors or alternatives. This could include aspects such as higher efficiency, increased reliability, or enhanced functionality that address the specific needs of the target audience. 3. Sustainability and Energy Efficiency: We emphasize the asset's focus on sustainability and energy efficiency. We highlight any eco-friendly practices, renewable energy integration, or resource optimization measures that make our asset more environmentally friendly than competing options. 4. Local Impact: We highlight the local impact and benefits of our asset within the region of Silvanus. We showcase how it contributes to the economic development, job creation, or environmental sustainability of the area, providing a unique value proposition for stakeholders and the community. 5. Successful Track Record: We provide evidence of previous successful implementations or case studies that demonstrate the positive outcomes and tangible results achieved through the use of our asset. This can serve as a reference point to showcase its effectiveness and reliability. 6. Collaboration and Partnerships: We highlight any collaborations or partnerships you have established with relevant stakeholders, organizations, or research institutions. This demonstrates our commitment to driving innovation, knowledge sharing, and continuous improvement, positioning our asset as a collaborative and forward-thinking solution.

11.2.33 Partner No 43 - HASICSKY ZACHRANNY SBOR MORAVSKOSLEZSKEHO KRAJE (FRS MB)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** Fire Rescue Brigade of Moravian-Silesian Region – FRB-MSR was established in 2001 as a state organizational unit with its own legal subjectivity. FRB-MSR is a self-contained accounting organization with own budget, which is financed from multi-sources (state and regional funds, local/municipal budgets and from own activities according to the Fire Law). FRB-MSR acts as regional fire prevention authority and regional crisis management and civil protection authority. It is based on a professional basis and belongs to public emergency services.
	2. Your motivation to participate in the project and commitment: Natural fires, wildfires and other kinds of natural disasters and emergencies have become serious challenges in last years. Reflecting the ongoing global climate changes, these kinds of emergencies will become even more challenging in close future and emergency services must be prepared to face this challenge and act accordingly to protect human health and lives, nature and other values.
	3. Means to achieve your objectives: FRS-MB will actively participate all related project activities with the means sharing its experience, skills and practice to achieve project goals. FRS-MB is well experienced, skilled and facilitated to act like fruitful, beneficial consortium partner.

	4. Opportunity which appeared/appears: SILVANUS project activities and outcomes are in synergy with alee the others FRS-MS activities. Besides, FRS-MB participates in other national and international projects, e.g. IPA Floods & Fires project (https://www.ipaff.eu/#), which are supplementary and in line with overall SILVANUS project goals and approaches.
WHAT AND WHY	**5. Exploitable assets and results:** All SILVANUS project outcomes related to forest fires detection and wildfire management are well exploitable and anticipated. They can bring significant added value and increase efficiency of wildfire emergency management.
	6. Rationale: As an end-user and a practitioner, we are interested in any technology or technical solution, which ca increase our performance and efficiency. Systems for early fire detection are significant toll to reduce the time of free fire spreading. UAV and UGV technologies are important tools to manage the wildfires. Applications for citizen and community engagement can be very beneficial to increase public awareness.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: We expect them to be in a close touch with end-users and practitioners to reflect their expectations and requests, to ensure that the project outcomes fulfil their needs.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** FRB-MS expect to be involved in the project outcomes validation processes.
	9. Measurement: As the SILVANUS project Pilot Case holder, we are going to hold in-field Pilot Case exercises and to test and validate project outcomes at the exercises.
	10. Positioning: N/A

11.2.34 Partner No 45 - TECHNICKA UNIVERZITA VO ZVOLENE (TUZVO)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** Technical University in Zvolen is a higher education institution providing education in three levels of studies within the European Higher Education and Research Area. In the higher education system in Slovakia, the TUZVO has a unique specialization within a focus on the spheres of forest – wood – ecology – environment with an appropriate expansion in other technical, natural, safety and security, economics as well as design spheres. Considering the focus of SILVANUS project, TUZVO provides a group of experts in the field of fire protection and safety, forest protection, forest management, forest economics and politics. It has a wide connections with state authorities, forest management practice, crisis management practice and professional and volunteer fire fighters. Except the expert knowledge, experience with stakeholders' involvement in research and development activities, it provides also services related to the organization of conferences, seminars, trainings, excursions, etc.

	2. Your motivation to participate in the project and commitment: The issue of wildfire risk management is of a big interest also in Slovakia. TUZVO has already solved research projects related to this issue in the past. In the field of wildfires is a leading research institution in the Central European countries. TUZVO was asked by UISAV to join the SILVANUS project consortium to provide expert knowledge, methodologies, data to develop tools and implement technologies supporting the combat with wildfires and to meet the requirements set by the end users via their involvement in development and demonstration activities.
	3. Means to achieve your objectives: TUZVO provides data and geodata for the pilot site to provide the analyzes and geo-analyzes (Use Cases). Results obtained are further used for demonstration purposes, e.g., opening-up analysis, fire susceptibility analysis, fire danger analysis, fuel models distribution, fire spread modelling, etc. TUZVO has an infrastructure and capacities for providing those analyses: software, hardware, data. The TUZVO capacities are composed of experts at the Faculty of Forestry (Department of Economics and Management of Forestry and Department of Economics and Management of Forestry) and experts at the Faculty of Wood Sciences and Technology (Department of Fire Protection). TUZVO has a strong connection with external stakeholders (forest managers, fire-fighters, state authorities, municipalities, legal persons, etc.).
	4. Opportunity which appeared/appears: For TUZVO, the SILVANUS project is in line with other projects (continuation) and reuse of know-how. As an output of project implementation is also establishment of CASD, which should be established at the Technical University in Zvolen. TUZVO is also involved in COST Action dealing with wildfires risk management in different aspects. There is a presumption of its further involvement in other research projects, consortia in the future.
WHAT AND WHY	**5. Exploitable assets and results:** Fire risk/ danger assessment, mapping of fuel distribution and loading, fire spread modelling, biodiversity assessment, optimization of forest management – alternatives provision, forest growth modelling, stakeholder's involvement, politics and strategies development, fire tactics optimization.
	6. Rationale: Experience and existence of best practice examples to be transferred among students, stakeholders from the forest management and fire protection practice, providing consultancy services and further R&D.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: TUZVO provides data, expert knowledge supporting the development of different tools to be involved in SILVANUS platform (e.g. fire spread modelling, forest restoration after the fire, biodiversity assessment, etc.). TUZVO expects that it should use the tools developed in the framework of SILVANUS project to test them and disseminate the information about them and results of their testing at the conferences, seminars, trainings organized by the CASD.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** CASD (established in 2023 as an organizational part of the TUZVO, and as a non-profit organization in 2025) and its promotion and advisory activities (2023-after project implementation).
	9. Measurement: Number of stakeholders involved and informed, number of stakeholders interested in using the services developed in the framework of SILVANUS project, number of seminars, conferences, trainings.
	10. Positioning: N/A

11.2.35 Partner No 46 - OBCIANSKE ZDRUZENIE PLAMEN BADIN (Plamen)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** PLAMEN Badin is a civic association providing, except others, fire, and rescue services through Volunteer Fire Brigade, mostly in the territory of Zvolen district but also in wider area when needed. As a civic association, it focuses the cooperation with local government, legal and natural persons, and other civic associations in the field of fire protection, especially in connection with providing the rescue, localization and liquidation works. It meets all personnel and technical conditions in the scope of requirements for Volunteer Fire Brigade of category C (according to Slovak legislation in the field).
	2. Your motivation to participate in the project and commitment: Networking, transfer of the state-of-the-art knowledge in the field of wildfire risk management, forest management, ICT technology. Testing/demonstration the technology developed in the framework of SILVANUS project and to share the information with other stakeholders (fire services) at local, regional, and national level.
	3. Means to achieve your objectives: Close cooperation with the Technical University in Zvolen, participation at Plenary Meetings (sharing knowledge), dissemination of project results at events organized by volunteer firefighting organizations in Slovakia, at meetings with municipality representatives, etc. Preparation, organization, and evaluation of Slovak Pilot demonstration.
	4. Opportunity which appeared/appears: PLAMEN has the personal capacities (sources) and technical equipment (resources) as well as contacts to prepared a demonstration involving as volunteer, professional and army firefighters to transfer the knowledge obtained during project implementation, test the technology integrated, evaluate the effectiveness of provided sets of methods and chain of technology to combat the wildfire and propose the measures, specify the recommendation for their improvement and better utilization in the fire prevention and firefighting practice.
WHAT AND WHY	**5. Exploitable assets and results:** Fire tactics selection using the data from the field, innovation of fire tactics manuals considering the involvement of progressive technology in decision making process, elaboration of training manuals as for volunteer as for professional firefighters.
	6. Rationale: Knowledge, experience dissemination among volunteer and professional firefighters, organizations responsible for fire prevention in Slovakia. Providing consultancy services for firefighters.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: PLAM will contribute and bring rich experiences of its senior firefighters in the domain of policy recommendations on environmentally sustainability and forest restoration in context of Slovak forests. It will also participate as a practitioner in the Slovak pilot in collaboration with TUZVO, with 3MON as the technology provider and UISAV as the scientific and large-scale computing expert. It will collaborate in exploitation and dissemination of project results among practitioners, too. And it will also contribute to standards and compliance for interoperability of the resulting platform and existing infrastructure in place in Slovak context.

ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** April 24-26, 2023 - demonstration of the Slovak Pilot; after elaboration of feasibility study for the Slovak Republic, fire tactics improvement methodologies, elaboration of training materials (Slovak/English).
	9. Measurement: Number of sources and resources deployed at the demonstration, number of documents elaborated, number of users of the newly developed documents (feasibility study, fire tactics, policies/strategies prepared, training materials developed.
	10. Positioning: N/A

11.2.36 Partner No 47 - YAYASAN AMIKOM YOGYAKARTA (AMIKOM)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** Universitas Amikom Yogyakarta is a higher education institution in Indonesia, working on Information Technology related field as well as Science and Technology ranging from Geography, Geographics Information system, Regional and Urban planning. Currently, we manage undergraduate and postgraduate programs for around 14.000 students. We are also supported by various fields by active researchers, not only on informatics but also its application related to agricultural and forestry.
	2. Your motivation to participate in the project and commitment: We want to take part in tackling world problems. Therefore, we need to work with experts all around the world to handle global problems, such as climate change. On the other hand, Indonesia as a tropical country has its uniqueness and must be considered in global initiative solution. We also believe that we can share our knowledge and expertise in this consortium to achieve breakthrough solutions for the forest fire problem, including fire prevention, fire response and forest rehabilitation after fire incidents.
	3. Means to achieve your objectives: As aforementioned, we have computer science department and active researchers in the field such as natural language processing, image processing and artificial intelligent in a whole. In the geographics and geographics information systems, we have active researchers in the faculty of science and technology mainly in disaster management working group. We also supported by the Sebangau National Park as the pilot location in Centre Borneo.
	4. Opportunity which appeared/appears: As academic partner we are very glad to take part in the dissemination activities such as academic paper writing and publishing. We believe our knowledge would be very useful in our environment and disaster management as well as geographics information system working group under the Faculty of Science and Technology. We work closely with the Sebangau National Park and they would be glad if some of our technological solutions such as social media sensing, mobile based biodiversity monitoring can be applied to the society around the national park.

WHAT AND WHY

5. Exploitable assets and results:

Open Forest Map is a platform for historical analysis of the forest rehabilitation program over time. Currently we plan to cover the area of analysis in the pilot location only but it is expandable to the wider area. This analysis relies on third party world monitoring data; therefore, we can ensure the data availability.

Fire Probability Prediction application is a software aims to predict the probability of fire considering 14 variables with the resolution of 0.75 x 0.75 km per pixel. Not only fire probability, this application also calculates the priority of resource allocation. Fuzzy inference, Bayesian theorems and monte Carlo are exploited behind this application.

An exploitation of natural language processing algorithms, deep learning methods, named entity recognition over multiple language are potential to have scientific contribution and we already published some of the result.

Research results as a knowledge related to the rehabilitation and restoration in forest fire prone areas. The result will be proposed as a model and a publication.

6. Rationale:

OpenForestMap enables researchers around the world generate initial time series data in certain spatial location, it potentially exploited as services for ecological further research.

Fire probability prediction along with other methods can serve stakeholder to predict the fire probability in certain area and guide them to create better resource planning to tackle future disaster probability. All of variables that suppose influence the level of fire risk has been researched academically, that basically comprise two aspects: Human Related Aspect and Physical Environment Aspect. For standardization of developed asset can be rationalized through comparing with the real data through time series (historical data) that suppose the real fire land has higher fire probability than those of never burned area.

Social media sensing can be used to identify forest fire as an early warning system. Researchers can predict the postings, images or videos relating to smoke, fire or flames occurrences by employing geolocation and keyword tracking.

Documents (deliverables of each task) provide contribution to the global knowledge. As research, the deficiency of the study must be developed beyond the existing result in the next future.

7. Your Value Proposition towards Joint Exploitation of SILVANUS:

As academic partner we are glad to share our research result with industrial partner for further exploitation.

ROADMAP WITH TIMELINE

8. Roadmap: the timeline plan you have for using those assets:

<table>
<tr><th>WORK LOAD</th><th>M1-M6</th><th>M7-M12</th><th>M13-M18</th><th>M19-M24</th><th>M24-M30</th><th colspan="2">M31-M36</th><th>M37-M42</th></tr>
<tr><td>D5.2</td><td></td><td></td><td>Develop models</td><td>Publish 1st paper</td><td></td><td></td><td>Integrated to silvanus cloud</td><td>Publish 2nd paper</td></tr>
<tr><td>D5.4</td><td></td><td>Exploring & Mathematics Modeling</td><td colspan="2">Generate Fuzzy Logic, Montecarlo and Bayes method</td><td>Beta Version of Data Fusion</td><td></td><td>Stable Release of Fire Risk Map and Resources Allocation</td><td>Publish paper</td></tr>
<tr><td>D6.1</td><td colspan="2">Rehabilitation & Restoration (RR)</td><td>Submit D6.1</td><td></td><td></td><td colspan="2"></td><td></td></tr>
<tr><td>D6.2</td><td></td><td></td><td>Time Series (RR)</td><td>Submit D6.2 Knowledge (impact, success/failed programs, etc.)</td><td></td><td></td><td>Publish 1st paper</td><td>Publish 2nd paper</td></tr>
<tr><td>D6.4</td><td></td><td colspan="2">Generate Open Forest Map (OFM)</td><td>Beta Version of OFM</td><td>Quantitative Analysis</td><td>Qualitative Analysis</td><td>Stable Release of OFM</td><td></td></tr>
</table>

	9. Measurement: For Measurement purpose, we propose the comparison of fire probability map with the historical real fire with reasoning that those of area with the actual high number of the fire will have high fire probability. The result of the deliverable will be published in the conference or journals, so that it might reach many readers globally. Hopefully it will provide more impact to the audience.
	10. Positioning: **Open Forest Map** - https://www.globalforestwatch.org/map/ - https://openforests.com/ - https://openforestobservatory.org/map-database/ - https://openforestobservatory.org/ **Data Fusion Application** Some tools that of similar with Fire Probability and Resources Allocation: - Wildfire Analyst Pocket Edition (https://pocket.wildfireanalyst.com/) - Wildland toolkit (https://apps.apple.com/us/app/wildland-toolkit/id318683999) - EFFIS Wildfire Risk Viewer (https://effis.jrc.ec.europa.eu/apps/fire.risk.viewer/) **Social Media Sensing** - https://socialsensing.com/ **Deliverable Document** The deliverable provides a more comprehensive report, because the pilots related in the result consist of many areas. The study on each pilot comprises many unique results depending on each area. Compared to other documents which contain only a specific area, the result might be limited.

11.2.37 Partner No 48 - COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION (CSIRO)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** CSIRO is Australia's scientific and industrial research organisation, with over 5000 staff across all states and territories of Australia. The team working with SILVANUS is in the Robotics and Autonomous Systems group within the Data61 Business Unit of CSIRO. Our group has extensive experience with mobile robots and mobile navigation through unstructured and natural environments. This is most clearly demonstrated by our podium finish in the DARPA Subterranean challenge last year.
	2. Your motivation to participate in the project and commitment: Bush fires are common in Australia and are a humanitarian and economic problem when they occur at scale, such as in 2019 which was so severe that the smoke reached Chile. Ground robots have a potential role in bushfire mitigation that has not been exploited yet. We believe the technology is close, but there is still research to be done.
	3. Means to achieve your objectives: We have a good existing suite of tools and robots as evidenced by the recent DARPA subterranean challenge 2021, of which much material can be found online. Our group is dedicated to research into

robotics and we have one of the world's leading mapping and localisation platforms (called WildCat, and earlier, the GeoSLAM original code).
Our site in Western Brisbane, Australia contains many forested areas, and we are within 20 minutes drive of parts of the D'Aguilar range forest. This aids in field testing.

4. Opportunity which appeared/appears:

We have connections with local fire fighting services, and have teams within CSIRO that have researched fire propogation. We also recently finished a project on assessing tree risk of falling on power lines, which can start a bush fire. We retain the IP to this developed technology and believe we can re-use and apply these works and links.
We are also have CSIRO internal projects on tree identification and biomass estimation from lidar maps, which are the same maps that our UGVs generate as part of their navigation capabilities. We believe that there is a strong connection between understanding the geometry of trees in the environment and assessing the danger posed by any incoming bush fire, so these continuing projects could continue some of that effort.

WHAT AND WHY

5. Exploitable assets and results:

We have a re-useable mapping and localisation device (called the CatPack) which could be used by other partners. We have tracked and legged (SPOT) robots that carry this device in order to autonomously navigate. We have multiple open-source libraries that help enormously with interpreting the 3D forest lidar maps (e.g. raycloudtools), we are developing software for tree gemoetry understanding and tree foliage density estimation that could be used by other mapping devices (such as by the UAV partner).

6. Rationale:

These assets are directly relevant to the work we do here in the Robotics and Autonomous Systems group. Queensland is a large rural area and so mobile robots that traverse unstructured terrain are required by local industry sectors such as agriculture and mining. We would like to expand the expertise into bushfire management.
As a research agency we are not planning on commercialising these assets directly, but they can be exploited in various ways. The software libraries are often open sourced, the know-how is disseminated through academic papers, and the mapping technology is available through licensing agreements.

7. Your Value Proposition towards Joint Exploitation of SILVANUS:

We provide to the partners a stable ground platform for navigating forests and therefore placing sensors in the vicinity of forest fires. Unlike drones, ground robots have a long battery life and can move and remain in areas for long periods of time while providing sensor feedback and on-board analysis.
From the partners we can can expect sensor payloads and sensor software to aid in understanding a nearby fire, and to aid in characterising the environment. This may include the location and temperature of a fire, its direction of travel, the state of the trees and undergrowth, and the location of humans and facilities in relation to the fire.
We share an interest in forest analysis, and so interpreting how a fire might spread, which areas are thickly vegetated, which aren't, and which areas have already been burnt.

ROADMAP WITH TIMELINE

8. Roadmap: the timeline plan you have for using those assets:

End May 2023: robot entering and leaving forested area autonomously. Offline estimation of foliage density
End Oct 2023 (Pilot in Australia): online estimation of foliage density, online estimation of tree density. Offline reconstruction of the tree environment.
End May 2024: grass and bracken-aware navigation- the robot does not treat tall grass or bracken as a hard obstacle, allowing the robot to navigate in thicker environments.
End Oct 2024: Place recognition: robot knows where it is when it wakes up and can merge its map with pre-existing maps, which may come from other robots.
End March 2025: Tested with payloads from other partners on the UGVs.

	9. Measurement: We plan to field test the robot before and after controlled burns in the nearby forests. We would like to invite personnel from local fire fighting departments to provide their feedback on the behaviour and results of the robot interaction with the forested environment.
	10. Positioning: The platform technology that we are developing has several components that we compare to alternatives here: 1. WildCat SLAM / CatPack: This is an in-house spinning lidar / mapping system. It is arguably world-leading, achieving the top accuracy score on the DARPA challenge and were first place winners in the Hilti SLAM Challenge. Alternatives include GeoSLAM (also originally developed by us), Kaarta. 2. Robots: We have Titan robots and SPOT legged robots. These could be swapped with different UGVs but the Titans are made locally and we have a good relation with them and they are rugged. Nevertheless, the technology in this project is not specific to any particular UGV. 3. Navigation software: The 'nav stack' is our software for performing tasks, negotiating terrain, path finding and exploring unmapped regions. The closest alternatives would be the software used by other teams in the 2021 DARPA Subterranean Challenge. Of these, only team CERBERUS (joint collab: University of Nevada, Reno, ETH Zurich, NTNU, University of California Berkeley, Oxford Robotics Institute, Flyability, Sierra Nevada Corporation) narrowly performed better, but we do not believe that its navigation software is made available. 4. Forest analysis: this is still in-development but available code is in the open source raycloudtools library (github). The closest similar work is called AdQSM, AdTree and TreeQSM, however these only operate on single trees. Therefore our analysis algorithms are already cutting edge and we are developing them further in this project. Raycloudtools is also used for other processing and analysis tasks on the generated 3D lidar maps of the forest, other such tools include LasTools, Open3D and PCL, none of these use the full ray information, so only work on point clouds.

11.2.38 Partner No 49 - UNIVERSIDADE FEDERAL DO RIO DE JANEIRO (UFRJ)

	QUESTIONS
PROFILE AND MOTIVATION	**1. Partner profile:** UFRJ's history dates back to the beginning of the 19th century and it is currently the best federal university in Brazil and the 3th best university in Latin America (65,000 students). UFRJ's Coppe is Latin America's largest center for research and education in engineering and was a pioneer in connecting academia and society, prompting the transformation of knowledge into prosperity for Brazilians. Its crucial role in the development of technologies in the oil and gas field has contributed to Brazil's leadership in deepwater oil exploration and production. Nelson F. F. Ebecken is a Professor of Computational Systems at COPPE/Federal University of Rio de Janeiro. He has given courses on Computational Methods for Engineering Problems since 1973. He has published 145 articles in scientific journals and coordinated about 136 R&D projects. His research focuses on natural computing methodologies for modeling and extracting knowledge from data and their application across different disciplines. He develops models for complex systems, big data and integrates ideas and computational tools. In 2005 he was awarded as member of the Brazilian Academy of Sciences. Rogério P. Espíndola is a researcher and professor at COPPE-UFRJ with experience in the development and deployment of intelligent models for industry using data and text mining, bio-inspired optimization and social network analysis. His expertise has been applied to various areas of knowledge, namely: biotechnology, ecology, water resources, transport infrastructure, power system and oil industries.

	2. Your motivation to participate in the project and commitment: Contribution in Silvanus in the work packages WP1, WP2, WP7, WP9, and WP10. Our motivation relies on contributing to environmental preservation, especially in the Brazilian Pantanal, through technological innovation; promoting the use of technology for forest fire prevention, forest monitoring, fire suppression, and forest recovery; encourage society to engage in prevention actions; and collaborating with researchers from different countries.
	3. Means to achieve your objectives: To achieve our goals, we will produce a literature review on topics related to forest fires in Brazil, contact stakeholders to disseminate Silvanu's technologies and acquire data and knowledge, develop machine learning models from forest fire data and promote the dissemination of lessons learned and innovations.
	4. Opportunity which appeared/appears: SILVANUS has a relation with our previous works with machine learning from remote sensing data. Since Brazil is a country that invests little in environmental protection, initiatives for forest fire prevention using information technology are still very scarce and not very ambitious. Thus, the technologies produced by Silvanus have the potential to transform firefighting in Brazil and stimulate many areas of research in various universities.
WHAT AND WHY	**5. Exploitable assets and results:** Wild fire machine learning models
	6. Rationale: As there is no short-term prospect of Brazil acquiring technology for forest fire prevention, firefighting, or forest recovery, the use of machine learning models developed within the Silvanus project can assist our partners in making more agile decisions and foster the acquisition of data that enables transfer learning to be conducted, bringing more agility to the knowledge discovery process. Therefore, the exploration of these models targets further research and development.
	7. Your Value Proposition towards Joint Exploitation of SILVANUS: We expect an intense exchange of multidisciplinary knowledge among different professionals. We can contribute to the generation of machine learning models and the acquisition of knowledge about the Pantanal, a unique reserve with great biological diversity that is essential for the hydrological balance of South America, which can be stored in Silvanus' knowledge base.
ROADMAP WITH TIMELINE	**8. Roadmap: the timeline plan you have for using those assets:** Since the financial support took a while to arrive, it has not been specified yet. There were no guarantees that we could proceed as planned at the beginning of the project.
	9. Measurement: We believe that useful models will be produced for the decision-making process of professionals directly involved in forest fires. Thus, through knowledge dissemination actions and the implementation of these models in operational environments, the opinions and evaluations of experts will be collected in specific forms to be produced. Quantitative and qualitative analyses are going to be performed.
	10. Positioning :

	We have extensive experience in the development of research and development projects spanning decades in various fields of knowledge. Furthermore, we are establishing close contact with different sectors of society, which often work in isolation to solve a problem of such global significance.

11.3 Annex III – IPR agreement

JOIN OWNERSHIP AGREEMENT

BETWEEN:

Description of partners detailed in the Consortium Agreement

1. **UNIVERSITÀ TELEMATICA PEGASO (PEGASO)**, established in PIAZZA TRIESTE ETRENTO 48, NAPOLI 80132, Italy, VAT number: IT05411471211, represented for the purposes of signing the Agreement by President, Danilo IERVOLINO and the following other beneficiaries, if they sign their 'Accession Form' (see Annex 3 and Article 56):
2. **ZANASI ALESSANDRO SRL (Z&P)**, established in VIA G B AMICI 29, MODENA 41100, Italy,
3. **INTRASOFT INTERNATIONAL SA (INTRA)**, established in RUE NICOLAS BOVE 2B, LUXEMBOURG 1253, Luxembourg,
4. **THALES (TRT)**, established in TOUR CARPE DIEM PLACE DES COROLLES ESPLANADE NORD, COURBEVOIE 92400, France,
5. **FINCONS SPA (FINC)**, established in CORSO MAGENTA 56, MILANO MI 20123, Italy,
6. **ATOS IT SOLUTIONS AND SERVICES IBERIA SL (ATOS IT)**, established in RONDA DE EUROPA 5, TRES CANTOS MADRID 28760, Spain, VAT number: ESB85908093,
7. **EMC INFORMATION SYSTEMS INTERNATIONAL (DELL)**, established in IDA INDUSTRIAL SITE, OVENS, Ireland,
8. **SOFTWARE IMAGINATION & VISION SRL (SIMAVI)**, established in SOSEAUA BUCURESTI-PLOIESTI 73-81 COMPLEX VICTORIA CORP CLADIRE C4 ETAJ 2, BUCURESTI 013685, Romania,
9. **CNET CENTRE FOR NEW ENERGY TECHNOLOGIES SA (EDP)**, established in RUA CIDADE DE GOA 4, SACAVEM E PRIOR VELHO LISBOA 2685 039, Portugal,
10. **ADP VALOR - SERVIÇOS AMBIENTAIS, S.A. (ADP)**, established in Rua Visconde de Seabra 3, LISBOA 1700 421, Portugal,
11. **TERRAPRIMA - SERVICOS AMBIENTAIS SOCIEDADE UNIPESSOAL LDA (TP)**, established in QUINTA DA FRANCA BORRALHEIRA, CARIA 6200 710, Portugal,
12. **3MON, S. R. O. (3MON, s. r. o.)**, established in CERNYSEVSKEHO 10, BRATISLAVA 851 01, Slovakia,
13. **CATALINK LIMITED (CTL)**, established in CHARITINIS SAKKADA 5, NICOSIA 1040, Cyprus,
14. **SYNTHESIS CENTER FOR RESEARCH AND EDUCATION LIMITED (SYNC)**, established in TAGMATARCHI POULIOU 33, LEFKOSIA 1101, Cyprus,
15. **EXPERT.AI S.P.A. (EAI)**, established in VIA FORTUNATO ZENI 8, ROVERETO 38068, Italy,
16. **ITTI SP ZOO (ITTI)**, established in RUBIEZ 46, POZNAN 61 612, Poland,

17. **IZQUIERDO/PIATRIK GBR (VMG)**, established in OLGA-BENARIO-PRESTES-STRASSE 2, BERLIN 10407, Germany,
18. **MASSIVE DYNAMIC SWEDEN AB (MDS)**, established in SANKT ERIKSGATAN 117, STOCKHOLM 113 43, Sweden,
19. **FONDAZIONE CENTRO EURO-MEDITERRANEOSUI CAMBIAMENTI CLIMATICI (CMCC F)**, established in VIA A IMPERATORE 16, LECCE 73100, Italy,
20. **EXUS SOFTWARE MONOPROSOPI ETAIRIA PERIORISMENIS EVTHINIS (EXUS)**, established in 73-75 MESOGION AVENUE, ATHENS 11526, Greece,
21. **RINIGARD DOO ZA USLUGE (RINI)**, established in KUSLANOVA 2, Zagreb 10000, Croatia,
22. **MICRO DIGITAL DOO ZA INFORMACIJSKE TEHNOLOGIJE (MD)**, established in RUDESKA CESTA 177, ZAGREB 10000, Croatia,
23. **POLITECHNIKA WARSZAWSKA (WUT)**, established in PLAC POLITECHNIKI 1, WARSZAWA 00 661, Poland,
24. **HOEGSKOLAN I BORAS (HB)**, established in ALLEGATAN 1, BORAS 50190, Sweden,
25. **GEOPONIKO PANEPISTIMION ATHINON (AUA)**, established in IERA ODOS 75, ATHINA 11855, Greece,
26. **ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS (CERTH)**, established in CHARILAOU THERMI ROAD 6 KM, THERMI THESSALONIKI 57001, Greece,
27. **PANEPISTIMIO THESSALIAS (UTH)**, established in ARGONAFTON FILELLINON, VOLOS 38221, Greece,
28. **ASSOCIACAO DO INSTITUTO SUPERIOR TECNICO PARA A INVESTIGACAO E DESENVOLVIMENTO (IST)**, established in AVENIDA ROVISCO PAIS 1, LISBOA 1049 001, Portugal,
29. **VELEUCILISTE VELIKA GORICA (UASVG)**, established in ZAGREBACKA 5, VELIKA GORICA 10410, Croatia,
30. **USTAV INFORMATIKY, SLOVENSKA AKADEMIA VIED (UISAV)**, established in DUBRAVSKA CESTA 9, BRATISLAVA 845 07, Slovakia,
31. **POMPIERS DE L'URGENCE INTERNATIONALE (PUI)**, established in 1 AVENUE DE L ABATTOIR, LIMOGES 87000, France,
32. **THE MAIN SCHOOL OF FIRE SERVICE (SGSP)**, established in SLOWACKIEGO 52/54, WARSZAWA 01-629, Poland,
33. **AGENZIA REGIONALE STRATEGICA PER LO SVILUPPO ECOSOSTENIBILE DEL TERRITORIO (ASSET)**, established in VIA GIOVANNI GENTILE 52, BARI 70126, Italy,
34. **LETS ITALIA SRLS (LETS)**, established in VIA PARINI 164, MODENA 41123, Italy,
35. **PARCO NATURALE REGIONALE DI TEPILORA (PNRT)**, established in VIA ATTILIO DEFFENU 69, BITTI 08021, Italy,
36. **FUNDATIA PENTRU SMURD (FptSMURD)**, established in STRADA GHEORGHE MARINESCU 50, MURES TIRGU MURES 540136, Romania,
37. **ASOCIATIA FORESTIERILOR DIN ROMANIA ASFOR (ASFOR)**, established in SOS PIPERA 46 A SECTOR 2, BUCURESTI 020112, Romania,
38. **KENTRO MELETON ASFALEIAS (KEMEA)**, established in P KANELLOPOULOU 4 ST, ATHINA 10177, Greece,
39. **ELLINIKI OMADA DIASOSIS SOMATEIO (HRT)**, established in EMM PAPA 5, THESSALONIKI 54 248, Greece,
40. **ARISTOTELIO PANEPISTIMIO THESSALONIKIS (AHEPA)**, established in KEDEA BUILDING, TRITIS SEPTEMVRIOU, ARISTOTLE UNIV CAMPUS, THESSALONIKI 54636, Greece,

41. **OSPEDALE ISRAELITICO (OIR)**, established in P ZZA SAN BARTOLOMEO ALL ISO 21, ROMA 00186, Italy,
42. **PERIFEREIA STEREAS ELLADAS (PSTE)**, established in YPSILANDI 1, LAMIA 35131, Greece,
43. **HASICSKY ZACHRANNY SBOR MORAVSKOSLEZSKEHO KRAJE (FRS MB)**, established in VYSKOVICKA 40 ZABREH, OSTRAVA 700 30, Czech Republic,
44. **HRVATSKA VATROGASNA ZAJEDNICA (HVZ)**, established in SELSKA CESTA 90A, ZAGREB 10000, Croatia,
45. **TECHNICKA UNIVERZITA VO ZVOLENE (TUZVO)**, established in T G MASARYKA 24, ZVOLEN 960 01, Slovakia,
46. **OBCIANSKE ZDRUZENIE PLAMEN BADIN (Plamen)**, established in HLINY 426 7, BADIN 976 32, Slovakia,
47. **YAYASAN AMIKOM YOGYAKARTA (AMIKOM)**, established in JL RINGROAD UTARA, DESA CONDONGCATUR, KECAMATAN DEPOK, KABUPATEN SLEMAN, PROPINSI DAERAH ISTIMEWA YOGYAKARTA, SLEMAN 55283, Indonesia,
48. **COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION (CSIRO)**, established in CLUNIES ROSS STREET CSIRO BLACK MOUNTAIN SCIENCE AND INNOVATION PARK, ACTON ACT 2601, Australia,
49. **UNIVERSIDADE FEDERAL DO RIO DE JANEIRO (UFRJ)**, established in AV BRIGADEIRO TROMPOWSKI SN 2, RIO DE JANEIRO 21941 590, Brazil,

hereinafter, jointly or individually, referred to as" Parties" or "Party" relating to the Action entiled

Integrated Technological and Information Platform for wildfire Management

in short

SILVANUS

hereinafter referred to as "Project" or "Action"

WHEREAS:

The Parties, having considerable experience in the field concerned and are conducting a Project to the Funding Authority as part of the Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020).

The Parties wish to specify or supplement binding commitments regarding intellectually property rights (IPR) handling among themselves in addition to the provisions of the specific Grant Agreement and Consortium Agreement.

NOW, THEREFORE, IT IS HEREBY AGREED AS FOLLOWS:

1. Purpose

1.1 The purpose of this IPR Agreement is to specify with respect to the Project the IPR ownership of all results developed within the Project.

1.2 The "SILVANUS" Grant Agreement and the "SILVANUS" Consortium Agreement are integral parts of this agreement and its content prevails should this agreement contain clauses contradicting them.

1.3 The agreements made herein settle only the purpose defined in section 1.1 and not any future contracts or contracts, which are currently negotiated between some Parties.

2. Definitions

Words beginning with a capital letter shall have the meaning defined either herein, in the Rules or in the Grant Agreement including its Annexes, or in the Consortium Agreement.

Component: each result (whatever kind or nature, including hardware, software, etc...) developed during the Project lifespan by one or several Parties (Lead or contributing parties).

Lead Developer. means the Party that has developed or led the development of a Component

Contributing Parties: means all Parties that have helped to the development of a Component.

IPR %: Is the respective share of property of a Component by a Party contributing to the development of it.

3. IPR Ownership

Section 8 and specifically subsections 8.1 and 8.2 of the Project Consortium Agreement, and Grant Agreement Art. 26 settle the ownership of Results.

In addition to the Grant Agreement and the Consortium Agreement, this document settles that "*Generation of Results"* means that an owner has developed through substantial effort, research, time, and expense, specific software components (Components).

A Result developed solely by one party shall be owned wholly by the Party that generates it. However, if a Result is jointly generated by two or more parties and it is not easy to ascertain the share of work of each

Party; or separate each party's intellectual contribution to the creation of the Result, then the Result will be jointly owned by the parties in their respective contribution.

The following table lists the percentage of ownership for all Components generated in the Project, whether owned by a single Party or distributed among several contributing Parties.

Name of component	Lead developer	Contributing parties	IPR %
UP1 - AR/VR training toolkit for trainers			
	SIMAVI		100%
UP2 - Fire danger risk assessment			
	CMCC		100%
UP3 - Fire detection based on social sensing			
		CERTH	35%
		UISAV	24%
		HB	13%
		CTL	8%
		WUV	8%
		EAI	6%
		AMIKOM	3%
		ATOS	2%
UP4 - Fire detection from IoT devices			
	CTL		
Camera based fire detection connected on a Raspberry Pi		CTL	20,00%
EMDC – Data Center installed on the Edge for data collection and analysis		DELL	20,00%
Fire detection algorithm that will run on the EMDC		ATOS	20,00%
Fire detection algorithms that will run on the edge on some embedded device		FINCONS	20,00%
Sensory data collection and analysis on a Raspberry Pi		UTH	20,00%
UP5 - Fire inspection using UAVs and UGVs			
		CSIRO	33%
		TRT	33%
		3MON	33%
UP6 - Fire spread forecast			
	EXUS		100%

Name of component	Lead developer	Contributing parties	IPR %
UP7 - Biodiversity profile mobile application			
	VTG		100%
UP8 - Citizen Engagement App			
	MDS		42%
	UISAV		42%
		HB	4%
		ITTI	1%
		SIMAVI	9%
		HRT	1%

Table 1: Software components and other materials of SILVANUS

Date:

Name:

Function:

Representing the following body:

Signature: