AnaEE
Infrastructure for Analysis and Experimentation on Ecosystems

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SEVENTH FRAMEWORK PROGRAMME
CAPACITIES
RESEARCH INFRASTRUCTURES
COMBINATION OF CP & CSA

REPORT ON TASK 5.2.1 - Review of leading organizations (public and private) that produce long-term ecosystem visions. The review will be made available online

Abstract: AnaEE will provide terrestrial and aquatic experimental services to a wide range of stakeholders addressing the grand challenges of future societies. AnaEE conducted a review of ecosystem visions and priorities among stakeholder focused on forest ecosystems as a case for future ANAEE services in order understand what AnaEE must provide.

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Organisation name of lead contractor: NIVA

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Revision N°: V1

Dissemination level:

PU Public (must be available on the website)	**[X]**
PP Restricted to other programme participants (including the Commission Services)	**[ ]**
RE Restricted to a group specified by the consortium (including the Commission Services) (precise to whom it should be addressed)	**[ ]**
CO Confidential, only for members of the consortium (including the Commission Services)	**[ ]**

Summary

Executive Summary

The DOW describes Task 5.2.1 as follows:

5.2.1.: By month 12 DTU, with support from CNRS and IT will review leading organizations (public and private) that produce long-term ecosystem visions. The review will be made available online

The main insights from this Report are:

a) There is general agreement among the different stakeholder types about the main challenges and needs for ecosystem research. This embraces:
    a. General agreement that all major ecosystem services are of interest
    b. All major threats and drivers are of interest
    c. All time scales from short to very long time scales are of interest
b) ANAEE experimental facilities shall address climatic, environmental and management driven changes in drivers; they shall measure responses of all major services; and perform experiments over a wide range of time scales.
c) ANAEE must combine monitoring, experiments and modelling in an efficient way to respond efficiently to all these demands.

It must be noted that this survey only focus on forest ecosystems as a proxy for all ecosystems covered by ANAEE. In this respect, forest ecosystems are considered a useful case as they embrace both natural and managed ecosystems and monetary as well as environmental services and short to long term time scales. However, some ecosystem types may have significantly different perspectives.

We would like to acknowledge and thank the other contributors to this Task, whose patient comments to multiple Report drafts were extremely valuable:

1. Introduction: Stakeholder visions and ANAEE services

Potential stakeholders and users of the AnaEE facilities represent many different societal interests: from political decision makers to private companies providing ecosystem services, to researchers optimizing these services or investigating impacts of major environmental pressures. AnaEE must be able to provide experimental, modelling and analytical services matching the needs of these users. In order to understand the major challenges perceived by such stakeholders and the potential services it could provide to help these, AnaEE has conducted a survey among stakeholders within the forestry sector. Conducting a broad survey among all potential sectors was not possible for practical and resources limitations; the forestry sector was chosen as a relevant sector because forests provide a wide range of services from commercial use to general leisure and nature values. Forests include ecosystems at all management levels from intensively managed to natural unmanaged. Thereby we have assumed that responses would be representative of the whole range of needs, the AnaEE infrastructure would have to address.

2. Design of the survey

The survey was carried out as a questionnaire aiming at reviewing ecosystem visions among stakeholders related to forestry. The questionnaire was relatively short with just 7 key questions acknowledging that a long survey would reduce the number of replies. The questions addressed services, threats and research needs in forest ecosystems. The questionnaire was accessed via a web-portal and was distributed among relevant COST actions and IUFRO (International Union of Forest Research Organizations) working groups.

Potential stakeholders were: Commercial companies, policy makers, NGOs, educational and research institutes, and organisations with interests in forest ecosystems (see ATTACHMENT I for a detailed list of stakeholder types)

Questionaire

Question 1: Stakeholder type - What is the relation of your organisation to forests?

(1) Private company - commercial
(2) Private association – non-commercial (eg. stakeholder association)
(3) National Governmental - policy level
(4) National Governmental - administration
(5) International - intergovernmental (eg. EU, UN)
(6) NGO
(7) Education - University
(8) Research institute - forest production
(9) Research - other forest services
(10) Other stakeholder interest

Question 2: Visions/Priorities - which services from forests are of key interest to your organisation (multiple answers possible)

(1) Ensure/maximise forest/timber productivity
(2) Ensure/maximise production of other forest products (berries, greenery, christmas trees)
(3) Ensure other commercial services (eg. hunting)
(4) Ensure high non-timber biomass production (e.g. biomass for energy)
(5) Protection/maximising biodiversity
(6) Protection of rare plant and animal species
(7) Protection and facilitation of wild life
(8) Diversified forest ecosystem structure (stand specific service provision)
(9) Ensure/maximise non-commercial leisure services
(10) Ensure/optimise public access to forests and forest services
(11) Climate protection (eg. increase carbon storage)
(12) Protection of clean drinking water
(13) Soil protection
(14) Equal access to forest goods and services from all citizens
(15) Forests as an integral part of landscape planning
(16) Other services

Question 3: Long term vision - what is the time perspective of the visions your organisation has for forests and forest services

(1) Short term perspectives (<10 years)
(2) Medium term perspectives (10-25 years)
(3) Long term perspectives (25-100 years)

Question 4: Threats - which are the major threats to the service provision from forest ecosystems seen from your organisations point of view. (multiple answers possible)

(1) Poor Management
(2) Lack of management
(3) Climate change (drought, flooding, elevated temperature etc.)
(4) Air pollution
(5) Leisure use
(6) Lack of demand
(7) Over exploitation
(8) Policy
(9) Other threats

Question 5: Research needs - Which types of research are needed to support the work/vision of your organisation. (multiple answers possible)

(1) Forest management research (e.g. species selection, harvest strategies, fertilisation ...)
(2) Long term monitoring of biodiversity, productivity etc.
(3) Experimental research with focus on climate change
(4) Experimental research with focus on other environmental aspects
(5) Experimental research for optimised productivity
(6) Access to laboratory facilities for specific analyses
(7) Access to model competences for long term ecosystem predictions
(8) Acces to model competences for scenario testing
(9) Forest diseases
(10) Other research

Question 6: Support to research - What is your relation/use of research

(1) Carry out own research in forest related issues
(2) Buying research from research institutes, universities etc.
(3) Provide financial support to research institutes and communities
(4) Supply research to other stakeholders
(5) Political regulations, framing, support or lobbying for relevant research
(6) Other support
(7) No support - neither political, economic nor mental

Question 7: Details about stakeholder

(1) Name of organisation
(2) Country (or international)
(3) No. of employees
(4) Contact

3. Results of the AnaEE ecosystem vision stakeholder survey

a) Responses

The survey has been taken by 191 stakeholders representing all stakeholder groups (Table 1). 80% of the responses come from different research institutions and universities while stakeholders with focus on the commercial and non-commercial forest services represent only 4.2%. Nevertheless, the number and spread of stakeholders is statistically significant and the answers will provide a good input to AnaEE in terms of assessing which needs from AnaEE will be of major importance.

Stakeholder type - What is the relation of your organisation to forests?		
Answer Options	**Response Percent**	**Response Count**
Private/public company - commercial	2,6%	5
Private association - non commercial (eg. stakeholder association)	1,6%	3
National Governmental - policy level	3,1%	6
National Governmental - administration	4,2%	8
International - intergovernmental (eg. EU, UN ..)	0,5%	1
NGO	5,8%	11
University-Forest research and education	43,5%	83
Research institute - forest production	13,1%	25
Research - other forest services	24,1%	46
Recreational use of forests	0,5%	1
Other stakeholder type (Please specify)	1,0%	2
answered question	**100**	**191**

Table 1 – Summary of stakeholder responses to the vision survey.

b) Service provision from forests

Productivity, biodiversity and climate protection are the three major services provided by forests according to the stakeholders. This is true for all stakeholder groups with only small differences among them. The services underline the multifaceted use of forests, as well as the variety of research demands to ANAEE.

Visions/Priorities - which services from forests are of key interest to your organisation		
Answer Options	**Response Percent**	**Response Count**
Ensure/maximise forest/timber productivity	36,1%	69
Ensure high non-timber biomass production (e.g. energy)	12,0%	23
Ensure/maximise production of other forest products (e.g. berries, greenery)	3,1%	6
Ensure other commercial services (eg. hunting)	1,0%	2
Protection/maximising biodiversity	52,9%	101
Protection of rare plant and animal species	11,5%	22
Protection and facilitation of wild life	11,5%	22
Diversified forest ecosystem structure	21,5%	41
Ensure/maximise non-commercial leisure services	4,7%	9
Ensure/optimise public access to forests and forest services	9,4%	18
Climate protection	39,8%	76
Protection of clean drinking water	13,1%	25
Soil protection	15,2%	29
Equal access to forest goods and services from all citizens	9,9%	19
Forests as an integral part of landscape planning	27,2%	52
Other services	9,9%	19
Answered question	**100**	**533**

Table 2 – Overall priorities of services from forests among stakeholders (up to 3 answers per stakeholder possible)

Visions/Priorities - which services from forests are of key interest to your organisation	Private Commercial	Political administration	NGO	University research	Consultants	Total
Ensure/maximise forest/timber productivity	4	5	4	55	1	**69**
Ensure high non-timber biomass production (e.g. energy)	2	0	1	19	1	**23**
Ensure/maximise production of other forest products	0	0	0	6	0	**6**
Ensure other commercial services (eg. hunting)	0	0	0	2	0	**2**
Protection/maximising biodiversity	3	10	8	79	1	**101**
Protection of rare plant and animal species	2	2	2	15	1	**22**
Protection and facilitation of wild life	1	1	4	16	0	**22**
Diversified forest ecosystem structure	2	1	0	38	0	**41**
Ensure/maximise non-commercial leisure services	1	2	0	5	0	**9**
Ensure/optimise public access to forests and forest services	1	5	1	10	0	**18**
Climate protection	0	3	3	70	0	**76**
Protection of clean drinking water	2	3	1	19	0	**25**
Soil protection	1	0	1	26	1	**29**
Equal access to forest goods and services from all citizens	0	5	1	13	0	**19**
Forests as an integral part of landscape planning	1	4	2	44	1	**52**
Other services	2	2	1	14	0	**19**
	22	**43**	**29**	**431**	**6**	**533**

Table 3 – Priorities of Forest services among different broader stakeholder groups

c) Time perspective in services from forests

There is a significant interest in both long and short term perspectives in the forest service provision with a clear trend towards the medium and long term perspectives. This reflects the long rotation times for forests and may be different for other ecosystems.

Long term vision - what is the time perspective of the visions your organisation has for forests and forest services		
Answer Options	**Response Percent**	**Response Count**
Short term perspectives (<10 years)	22,0%	42
Medium term perspectives (10-25 years)	46,1%	88
Long term perspectives (25-100+ years)	53,4%	102
answered question	**100**	**232**

Table 4 – Time perspective in visions in forest research (more than one answer possible)

d) Threats to services from forests

The major threats to forest services as percieved by the stakeholders are shown in table 5 and 6. All types of threats are of concern, with the drivers of climate, management and land use being the most important. Ideally, ANAEE will have to provide research facilities to address these in the first place. Some important drivers may pose a significant challenge such as those acting at very large scales (the land scape scale).

Threats - which are the major threats to the service provision from forest ecosystems seen from your organisations point of view.

Answer Options	Response Percent	Response Count
Poor Management	13,7%	74
Lack of management	7,0%	38
Climate change (drought, flooding, elevated temperature etc.)	19,6%	106
Air pollution	5,4%	29
Fire risk	5,9%	32
Storm damage	2,6%	14
Pest and disease outbreak	8,7%	47
Landscape fragmentation	10,5%	57
Pressure from land use outside forest (eg. agriculture, "urbanisation")	13,1%	71
Leisure use	0,9%	5
Lack of demand	1,1%	6
Over exploitation	5,9%	32
Policy	4,4%	24
Other threats	1,3%	7
answered question	**100,0%**	**542**

Table 5 – Percieved threats to services from forests

Threats - which are the major threats to the service provision from forest ecosystems seen from your organisations point of view.

	Private Commercial	Political administration	NGO	University research	Consultants	Total
Poor Management	2	5	5	61	1	**74**
Lack of management	1	4	0	32	1	**38**
Climate change (drought, flooding, elevated temperature etc.)	4	7	3	90	1	**106**
Air pollution	1	0	0	28	0	**29**
Fire risk	2	3	2	25	0	**32**
Storm damage	2	4	0	8	0	**14**
Pest and disease outbreak	1	3	0	42	0	**47**
Landscape fragmentation	3	4	4	44	1	**57**
Pressure from land use outside forest (eg. agriculture, "urbanisation")	2	8	6	55	0	**71**
Leisure use	0	2	0	3	0	**5**
Lack of demand	0	1	0	5	0	**6**
Over exploitation	2	1	5	23	1	**32**
Policy	1	2	3	18	0	**24**
Other threats	1	0	1	5	0	**7**
	22	**44**	**29**	**439**	**5**	**542**

Table 6 – Percieved threats to services from forests distributed among stakeholder groups

e) Research needs in forests

The need for research related to forest services reflects the main services provided by the forests. Threats towards these services raise strong need for monitoring and experimentation, particularly related to the key services and the major drivers of change (77,3%, Table 7). However, there seem to be a demand for all major areas of research except specialised laboratory facilities.

Research needs - Which types of research are needed to support the work/vision of your organisation.		
	Response Percent	Response Count
Forest management research (e.g. species selection, harvest strategies, fertilisation ...)	14,6%	79
Long term monitoring of biodiversity, productivity etc.	22,0%	119
Multifunctional landscape research - game-wild life, hunting etc.	8,7%	47
Experimental research with focus on climate change	16,5%	89
Experimental research with focus on other environmental aspects	11,1%	60
Experimental research for optimised productivity	4,4%	24
Access to laboratory facilities for specific analyses	2,4%	13
Access to model competences for long term ecosystem predictions	8,1%	44
Acces to model competences for scenario testing	4,8%	26
Forest diseases	4,6%	25
Other research (Please specify)	2,6%	14
answered question	100%	540

Table 7 – Research needs in forest services (up to 3 answers per stakeholder)

Most stakeholders are themselves directly involved in research, which is of course explained by the fact that most of the participants in the survey come from universities and research institutes. However, 20% of the answers represent administrative and political framing of the research in the forest sector.

Support to research - What is your relation/use of research		
	Response Percent	Response Count
Carrying out own research in forest related issues	75,7%	143
Buying research from research institutes, universities	1,1%	2
Provide financial support to research institutes and	5,8%	11
Supplying research to other stakeholders	6,9%	13
Political regulations, framing, support or lobbying for	6,9%	13
No support - neither political, economic or mental	0,5%	1
Other support	3,2%	6
	100%	189

Table 8 – Stakeholder involvement in forest research

Conclusions

The stakeholder survey on forest services provides a significant input to understand the potential of ANAEE as a research platform to service the stakeholder groups in addressing the major services and threats. The results illustrate that ANAEE will have to provide a very broad range of research facilities to address:

- All major threats
- All major services
- Short-to-long term time scales

ANAEE therefore must include advanced experimental facilities to manipulate all major threats and drivers, must allow for measurements of all major response variables and must address a wide range of time scales. This means that a combination of monitoring, experimentation and modelling is most likely needed.