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IN-SYLVA France: National research infrastructure for adaptive management in forests

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A research infrastructure to tackle the challenges of global change in forests

- Context: Global Change and the socio-economic environment (energetic/ecological transitions) increase the pressure on forests and wood-based products.
- Needs: Innovation in forest management to ensure forests ecosystem services sustainability and adaptation to global changes.
- ⇒ The National Research Infrastructure IN-SYLVA France, has been nominated to the French roadmap for research infrastructures in March 2018, coordinated by INRAE.
- ⇒ IN-SYLVA France is a response to the social, economic and environmental challenges described in [The National Forest and Wood Programme](#).
- In-Sylva France brings together the research facilities of all French institutes working on forest management : INRAE, CIRAD, ONF, FCBA, CNPF, OFB, and University of Rouen Normandie.
- It's originality is to leverage silvicultural, biogeochemical and genetic tools to elaborate an adaptive and sustainable approach to the management of forest stands.

⇒ IN Sylva France contributes to all scientific objectives (GOS) of the Ecology and Biodiversity research division (ECODIV) of INRAE

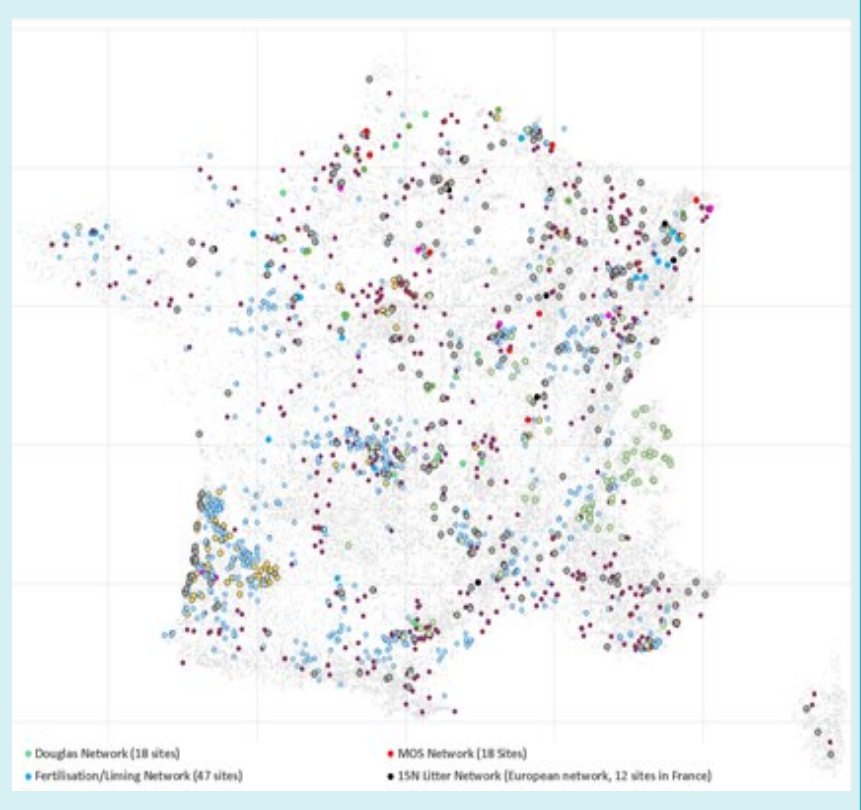
IN-SYLVA France is ...

An answer to challenges	Using sciences	To create innovations
Global change adaptation	Forest sciences, Biochemistry, Genetics.	Breeding new varieties
Sustainability	With dedicating services	Guiding species choice in plantation forest
Forest ecosystem services		Stand Renewal and Structure
Regulation of biological cycle	In-Situ	New silvicultural itineraries for adaptive management
Forests in transition	In-Lab	Wood harvest intensity
Biological invasions	In-Silico	
Bioeconomy		

Services for scientific communities

In-Situ* services:

- 27 networks; 5000 forest sites; 4000 ha.
- An experimental network of IN-SYLVA France includes several sites spread over a given territory (regional - national).
- One site includes several treatments.
- The objective is to multiply the pedo-climatic conditions to test a panel of treatments.
- The networks are divided into 4 main themes :
 - Forest genetic resources
 - Cross-effect of silviculture and genetics
 - Stand renewal and silviculture
 - Ecosystem services and silviculture



In-Lab* services:

- Analytical platforms are specialized in functional ecology, biogeochemistry, xylosciences, genetics, vegetative multiplication.

In-Silico* services:

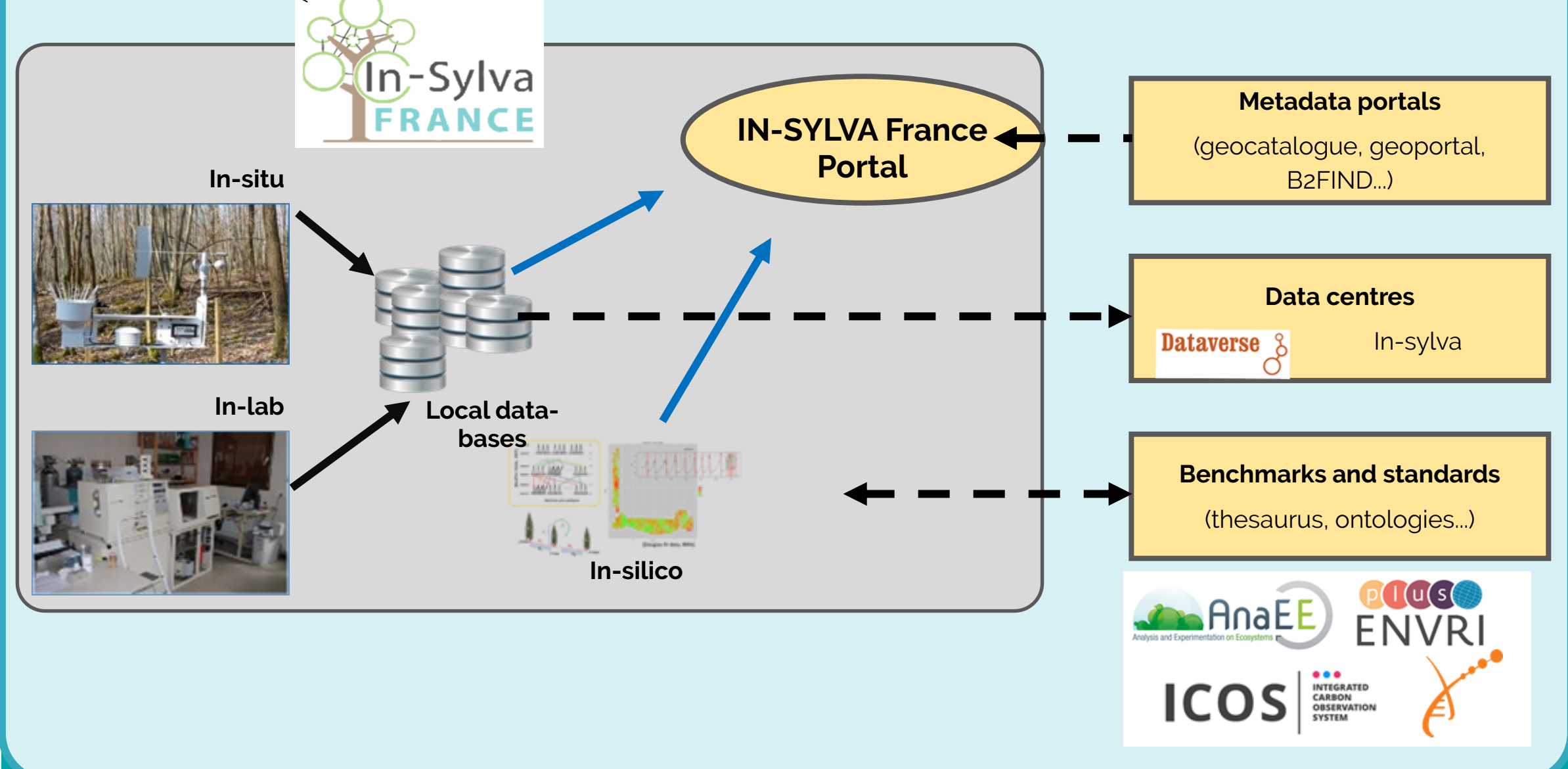
- Databases and information systems, analyses software and simulators
- IN-SYLVA France information system

*In-Situ, In-Lab and In-Silico permanent services are supported by partners

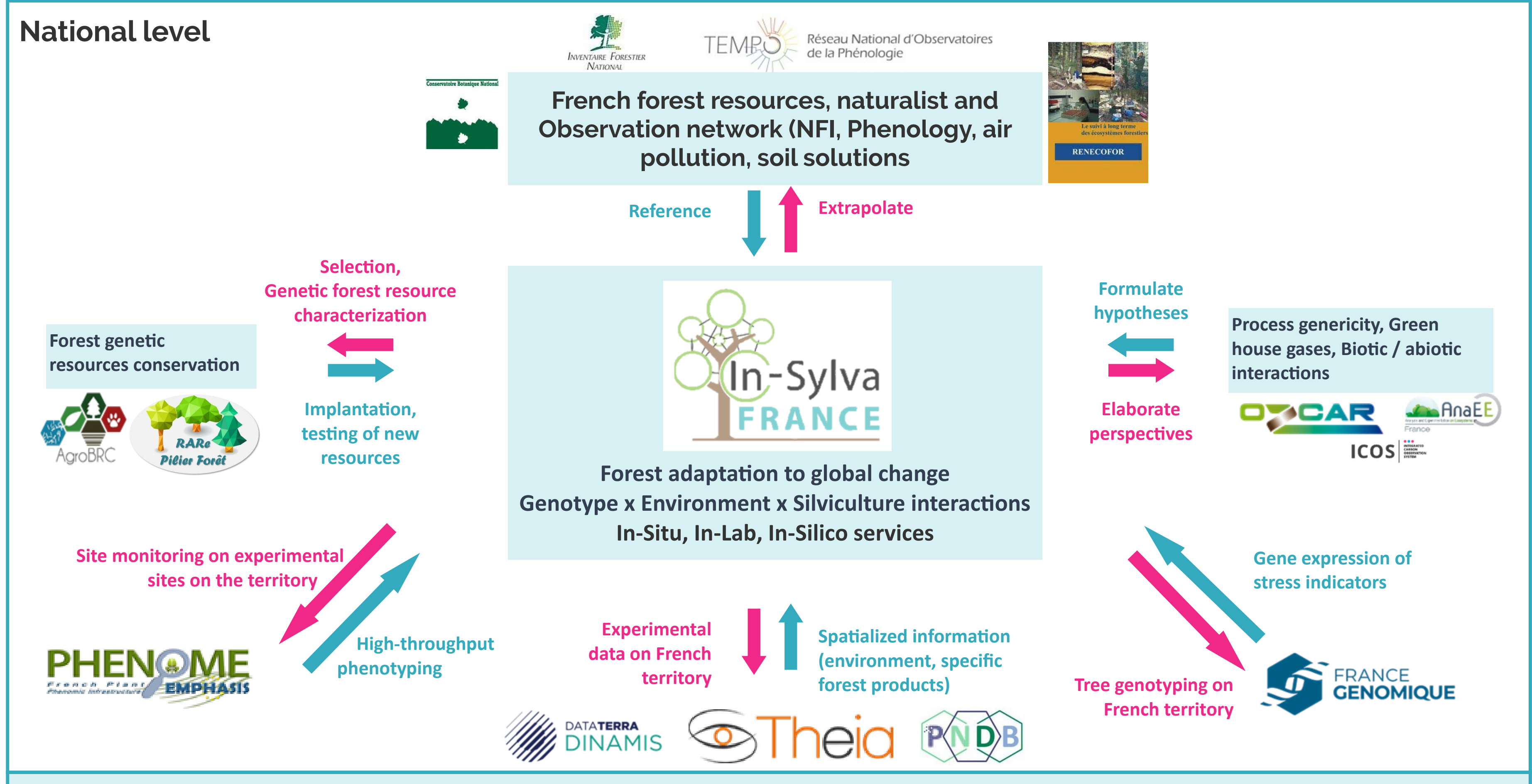
IN-SYLVA France information system

IN-SYLVA France information system federates local information systems of partners distributed in a national and international landscape

Website: http://w3.avignon.inra.fr/bas_insylva/login?requestType=search



A research infrastructure with an European ambition



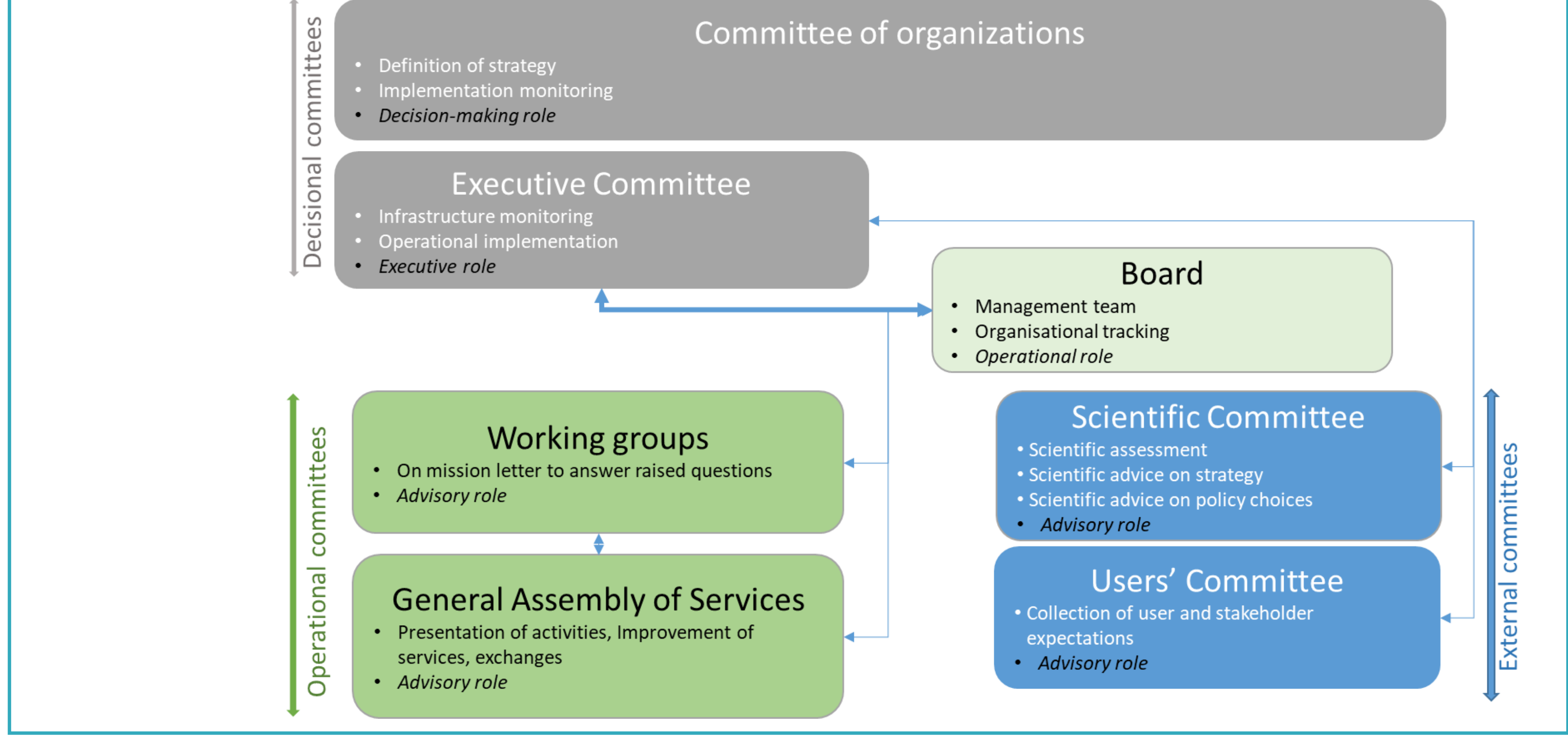
European level

European Union Centre for the Adaptation of Forests to global change (IN-SYLVA Europe)

Starting community in genetics TREES4FUTURE, extended to other domains by integrating:

- Observation and experimentation field networks (France: In-Situ services of IN-SYLVA France, ICP-Forests, TREEDIVNET..., Germany: The LONG-TERM YIELD Experiment, Sweden: SILVABOREAL in Sweden...),
- High throughput analytical platforms (in functional ecology, wood sciences, plant health...),
- Forest dynamics modelling and socio-economical platforms.

Organisation



Perspectives

Enhanced capacity:

- State of the art field tools (environmental characterization, tree measurements, data transmission).
- High throughput analytical platforms (soil and vegetation).
- Flowchart of samples between facilities (comprehensive data sets).

Improved spatial data: High resolution and high quality sources (satellites, air flights, drones) and analytical techniques (optic, lidar, radar, spectrometry).

Virtual (In-Silico) experiments: « Virtual experiments » interfaces that take into account forest science challenges (climate change, ecosystem services etc...), for **research** and **academic or vocational training**.