

## Information systems and observatories

n information system is a scientific, technical and institutional platform that binds links within a community (companies, public institutions, research groups, territorial associations, etc.) via information. The aim is to build knowledge and to participate in coordination and negotiation between stakeholders concerned about a specific territorial or societal issue. The system, which pools structured human and material resources, organises and integrates data acquisition, processing, management, sharing and dissemination via given reproducible protocols. These functionalities are tailored to specific needs, such as knowledge building, coordination or negotiation between stakeholders.

All information systems include managerial and organizational aspects which underlie their creation, along with computer technology aspects. A system may therefore be oriented according to two standpoints, i.e. depending on the typology and nature of the information circulating between individuals, or on the system's architecture, which facilitates information exchange and storage.

The typology of information systems is broad ranging. A few that are devoted to the environment are (but this list is not exhaustive):

- technical information systems in which observation services supported by sensor networks may be classified
- organizational information services that enable some organizations to structure their information, such as environmental research observatories serving the scientific community
- information systems that are supported by informal networks in which information circulates and which can provide support for territorial projects
- information systems devoted to both monitoring and decision support, which could be called 'observatories'.

Some Agropolis teams focus research on methods concerning resource management and environmental change issues. Information systems developed in this framework should account for the complexity of the issues in terms of the diverse range of stakeholders and spatiotemporal scales. In a multi-institutional setting, the representations that stakeholders have of the same system (e.g. a territory) and their motives for subscribing to a common information sharing objective are wide ranging, and data heterogeneity is high (nature, format, scale, etc.).

Observatories represent a specific instance of information systems. They are set up to observe (monitor, analyse, understand), within a spatial area representative of a territorial entity targeted for research, socio-environmental dynamics resulting from dynamic interactions of socioeconomic and biophysical systems. These are sites for the production, exchange and sharing of information and knowledge with a long-term scope. They thus require methods specifically adapted to the management of cumulative data processes (sustainability, replication, storage, etc.) and of knowledge building processes (sharing, exchange, interaction, etc.).

This chapter highlights-through a selection of representative examples-how the teams are involved in upstream and follow-up research activities to facilitate efficient operation of information systems and observatories in many areas throughout the world: needs analysis, specification and instrumentation. It also showcases the diverse range of uses, depending on whether the focus is on knowledge production, information management and sharing or supporting decisionmaking processes. It reveals the challenges faced with respect to successfully integrating the range of different stakeholders and their views, taking the different spatial and temporal aspects of information into account, representing its complexities, managing uncertain data aspects, mobilizing and combining many different data sources, etc.

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