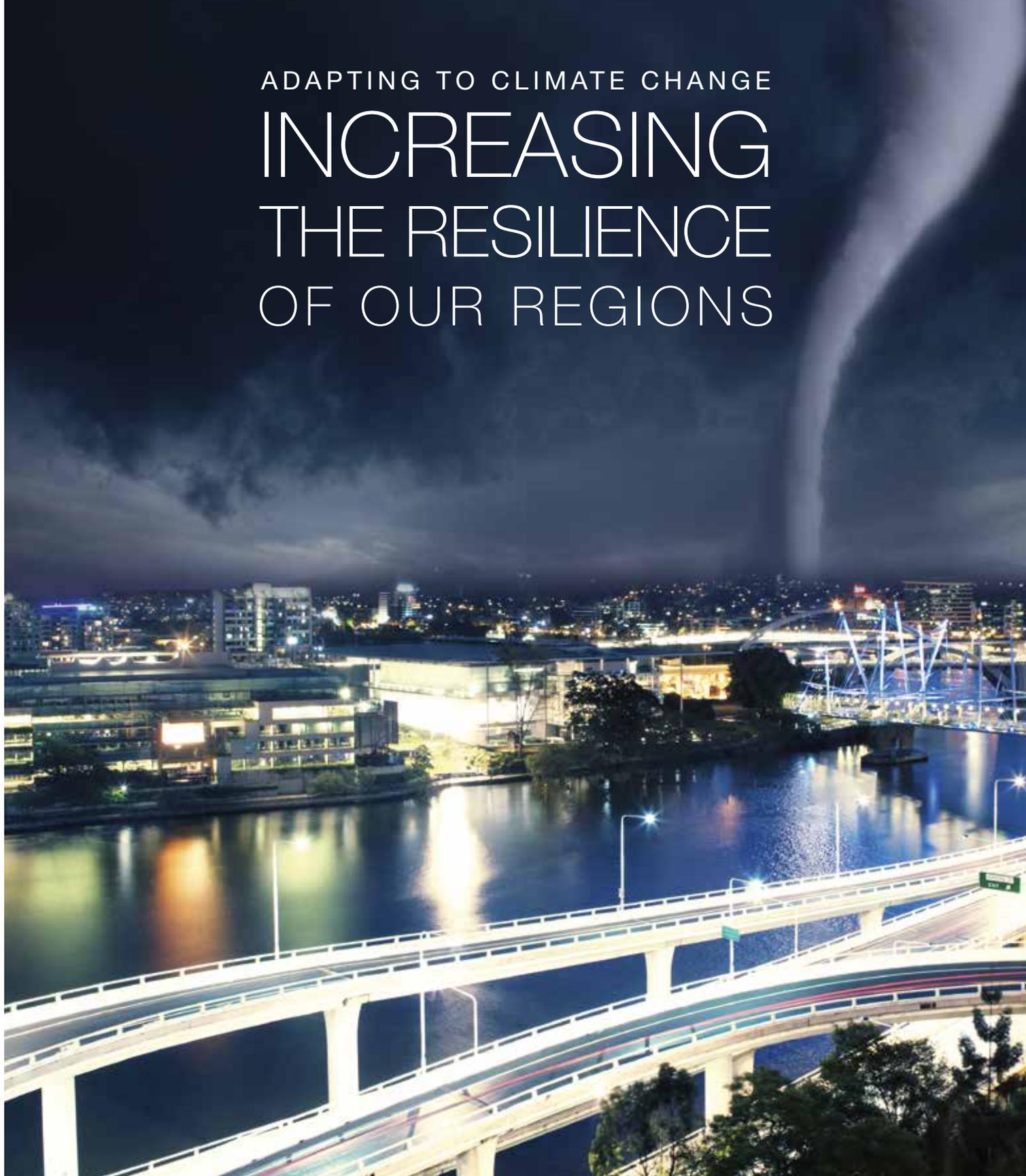


ADAPTING TO CLIMATE CHANGE
INCREASING
THE RESILIENCE
OF OUR REGIONS



Partner of all your
SUSTAINABLE
development
programmes

Our commitment

UNDERSTANDING AND CONSIDERATION OF RISKS

With their long-term impact on the organisation of a region or a community, infrastructure and local development projects must be designed, built and managed sustainably. This means not only reducing the carbon footprint but also improving their capacity to adapt to climatic hazards.

To raise awareness among organisations that work on these projects from planning through to operations, Egis has developed unique know-how, calling on a wide range of expertise, methodological approaches and specific tools and solutions.

Whatever the degree of involvement, the vocation of Egis is to support its clients in risk assessment, planning, prevention and control, and also to capitalise on its experience and expertise in order to better reduce risks in a perspective of territorial resilience.

Insight

REASONS TO INVEST IN CLIMATE CHANGE ADAPTATION



“Climate change has environmental, economic, health-related and social impacts.”

Yves ENNESSER,
Head of Projects, Environment & Climate

What are the issues behind adapting to climate change?

Yves Ennesser: Climate change is a reality today, with proven environmental, economic, health-related and social impacts. It has an influence on the intensity and frequency of extreme weather events such as river and urban flooding, coastal erosion and submergence, landslides, droughts, heat waves and storms. Adapting to climate change has become essential, and the rules that govern the design of projects must evolve. Given the growing consequences of natural disasters, stakeholders in a position of responsibility cannot simply pretend they were not aware of the danger: they are now open to a risk of litigation.

Mireille Raymond: We will have to learn to live in an increasingly volatile climatic environment. Climate change is an additional factor to take into account when managing and developing towns and regions. New approaches must be developed so that countries become fully resilient to climate risks.

Why invest now?

Y. E.: There is significant uncertainty around climate change, particularly as regards the evolution of extreme weather conditions. Since we cannot predict future change with sufficient precision, we have to prepare for significant change as of today.

M. R.: Indeed, the modelling of external climatic events often produces inconsistent results according to the “climatic models – greenhouse gas emission variation scenarios” combinations studied. In this perspective, it is wiser to talk about the notions of “acceptable risk” or “manageable risk” which are at the very core of current thinking about flood risk management in urban areas. And in any event, economic analysis shows us that the earlier adaptation expenditure is committed, the better is the return on investment. The costs arising from the deterioration and subsequent repair of public or private assets can be avoided by this anticipation. In other words, it is best to act today in order to make savings tomorrow!

How can an adaptation strategy be measured?

Y. E.: The best thing is to conduct cost-benefit assessments, weighing up the cost of adaptation and the damage avoided (the benefit contributed) by this adaptation. This type of economic analysis is not always essential and some adaptation strategies are simply a matter of common sense, such as so called “no regrets” strategies.

M. R.: I think it is necessary to integrate this new climate change-induced uncertainty into the design of structures which require economic justification. The notion of the durability of developments, associated with the new principles of development and adaptability, should be incorporated in the economic analysis.

“We must adapt to the volatility of the climate.”



Mireille RAYMOND,
Hydrologist



We are...

EXPERTS IN CLIMATE RISK MANAGEMENT

Egis works on all types of infrastructure and on all scales of regional planning, (urban, rural, coastline) and also advises policymakers on the steps they plan in order to address climate change vulnerability.



Egis mobilises its teams of specialists on building, infrastructure, city and regional scales in three categories of adaptation:

- ▶ extreme meteorological events (flash flooding, storms, heat waves and cold snaps)
- ▶ consequences of sea level rises (coastal submergence and erosion)
- ▶ management of water resources

We offer...

EFFECTIVE METHODOLOGY AND TOOLS

To support its clients faced with the challenges raised by climate change, Egis has developed effective and innovative solutions which can be put to use both on infrastructure and on a regional scale.

RESILIS

Supported by the French national research agency (ANR) as part of the research programme Sustainable Cities 2009, RESILIS develops methods and tools to increase urban resilience. An analysis of how the urban system functions when faced with natural and technological hazards is conducted using a systemic approach which covers:

- ▶ technical aspects (in particular the interdependency of urban utilities networks);
- ▶ organisational aspects (risk governance);
- ▶ cultural aspects (policymakers, economic actors and inhabitants becoming aware of the risk).



GeRiCi

Climate change has a considerable impact on infrastructure vulnerability. In this respect, traditional concepts based on return frequency such as the “hundred year flood” are becoming increasingly unreliable. These conclusions, together with a tangible risk anticipation and management tool, are now available to project owners and operators in the form of the project GeRiCi (Management of climate change-related risks to infrastructure) which was finalised in 2007 as part of a civil engineering and urban network project financed jointly with the French Equipment Ministry.

Egis continued its research into factoring climate change risk into the design and management of infrastructure in 2010 with the European project RIMAROCC (Risk Management for Roads in a Changing Climate) and subsequently in 2013 with another European project: ROADAPT (Roads for today, Adapted for tomorrow).

EDUCATION

Institut
Forhom

France, since 2011

*Factoring climate change
into the management
of programmes and projects*



VULNERABILITY
STUDY

Réseau
Ferré de
France

France, 2011

*Vulnerability of national
rail network to extreme
weather conditions*



METHODOLOGY
SUPPORT

French Development
Agency (AFD)

France, 2013

*Development of a method of assessing
the vulnerability to climate change
of projects funded by AFD*





**WARNING
SYSTEM**

City of Nîmes

France, 2004

ESPADA - Evaluation and Track of Rainstorms in Agglomeration to Anticipate Alarm

World Bank

Northern Africa, 2011

Climate change adaptation and natural disaster mitigation planning for large coastal cities (Alexandria, Tunis, Casablanca)

**REGIONAL
PLANNING**



**ECONOMIC
STUDY**

Asian Development Bank

Bhutan, 2012

Institutional support to the National Environment Committee in the field of climate change

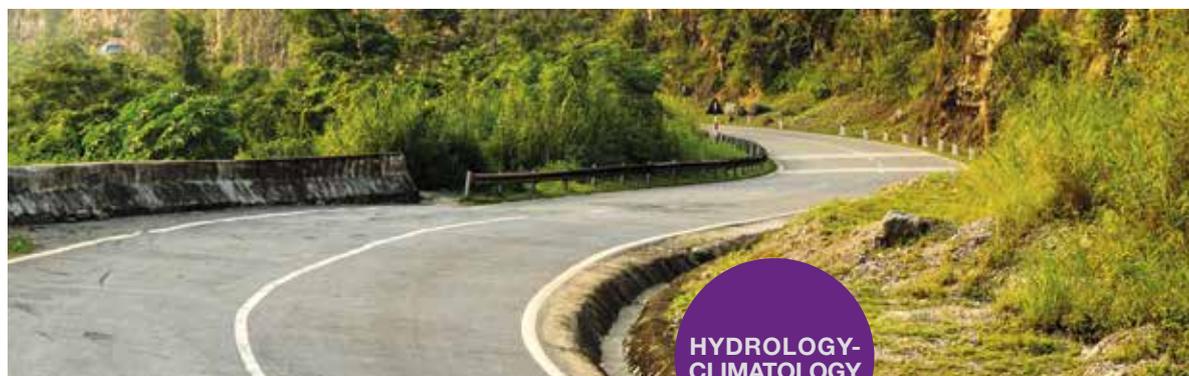
**INSTITUTIONAL
SUPPORT**



World Bank

Senegal, 2013

Economic and spatial study of the vulnerability and adaptation of coastal zones to climate change



**HYDROLOGY-
CLIMATOLOGY**

World Bank

Vietnam, 2012

VRAMP (Vietnam Road Asset Management Project) to fight flooding and reduce climate change related hazards on the highway NH 1A on a stretch of 2,300 km

Egis worldwide

INTERNATIONAL EXPERTISE AND DEDICATED SUPPORT FOR YOU

Egis is a group that offers engineering, project structuring and operations services. In engineering and consulting its sectors of activity include transport, urban development, building, industry, water, environment and energy. In roads and airports its offer is enlarged to encompass project development, equity investment, turnkey systems delivery, and operation and maintenance services. 75% of Egis is held by the French "Caisse des Dépôts" and 25% by management and employees.

Established in more than

100
countries

More than

1,000

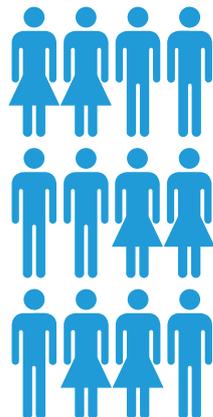
assignments outside France every year

€881 M

turnover in 2013

Airports and Air navigation
Bridges, underground structures and geotechnical engineering
Buildings
Cities Energy Environment
Industry Mining
Ports, waterways and maritime
Rail and urban transport
Roads Rural development
Systems Water

12,000
employees



A local player offering global solutions

7,500
engineering employees

4,500
motorway and airport operating employees



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