

France's Remote Sensing Strategy for Sustainable Development

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Abstract: - In this paper we examine the concept of "Sustainable Development" from the perspective of Satellite Remote Sensing Technology as a new means to achieve Sustainable Development. We define Sustainable Development and present research results on how the concept is perceived by the French Public, present the French Remote Sensing Strategy for Sustainable Development and provide examples of their application from around the world.

Key-Words: - Remote Sensing, Strategy, Sustainable Development, France.

1 Introduction

Sustainable Development from the perspective of Satellite Remote Sensing Technology is an innovative solution which is being systematically implemented in France since 2003 to assist the new Ministry of the Ecology and of Sustainable Development [1] in its mission to preserve the environment and resources of the planet. In the present article we examine sustainable development in practice and how it is framed by the larger discussion of sustainability and the pressing economic and political issues of our world [2]. In the broad context, we examine how France is attempting to achieve sustainable development [3]. We examine the French commitment to Sustainable Development as advocated by President Jacques Chirac after the Johannesburg Earth Summit of 2002, with the 6 major themes of that strategy and onto how the observation of the earth from space with Remote Sensing technologies of the CNES with SPOT Image at global and local scales works for France to achieve sustainable development.

2 What is sustainable development?

Sustainable development is still a fuzzy concept for most people around the world. In France, for example, According to a survey conducted by IPSOS for the French Ministry of State for Sustainable Development in April 2003, one third of the population professes never to have heard the expression "sustainable development" and among those who have heard it, very few really understand what it means.

The concept of sustainable development first arose in 1980 from the simple realization that human activities cannot be allowed to develop according to

economic considerations alone, but that certain social and ecological concerns also need to be addressed. In 1987, The "Brundtland Report" as it is known, named after Gro Harlem Brundtland, former chair of the World Commission on Environment and Development was a report produced for the United Nations entitled "Our Common Future" defined the concept as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Contrary to popular belief, sustainable development covers much more than just the environment. It is a new development model based above all on solidarity between generations (preserving the planet and its resources for the future) and peoples (sharing riches and bridging the gap between North and South). To achieve this aim, the model seeks to reconcile:

- Economic factors, by controlling growth and globalization while maintaining economic efficiency;
- Social factors, through combating poverty, social exclusion and inequalities by meeting fundamental human needs: food, employment, health, housing and education;
- Environmental factors, by preserving natural resources and managing the environment and lands responsibly.

3 Sustainable Development in practice

Sorting waste, keeping an eye on energy consumption, saving water, using public transport, buying environmentally friendly products and consuming less paper are all examples of how each citizen can contribute to sustainable development, alongside government and corporate policy initiatives [5].

Sustainable development is about thinking globally and acting locally. That is why governments are now stepping up their efforts to raise awareness and inform the public about sustainable development. Indeed, no national or international strategy will work unless citizens wake up to the consequences and get actively involved.

In a survey conducted in France (*Source: IPSOS survey on sustainable development conducted for the French Ministry of State for Sustainable Development in 2006*), 29% of respondents said they want more practical advice on how to make sustainable development a part of their daily lives, and 20% want to know more about how corporations are integrating the concept. Between 62 and 94% said they make efforts to reduce their energy consumption, sort household waste (see Figure 1), return used medicines to their pharmacist or are involved in charity initiatives.



Figure 1: Garbage truck in South Africa (2006).
Source: IRD/ Elisabeth DELIRY ANTHEAUME

The way to achieve this aim is to explain sustainable development to the public through practical initiatives and by highlighting how the way we live impacts factors such as climate change, poverty and depletion of natural resources [7]. Although sustainable development is predicated upon specific modes of production, it also is the result of carefully considered consumption practices that require each and everyone of us to do things differently at work, in the home and in our leisure time.

4 Achieving sustainable development

Today (2007), 20% of humanity consumes more than 86% of the planet's resources. Whichever way we look at it, the scales are tipped very much in favor of industrialized nations, to the detriment of developing countries [6]. If the whole world adopted the mode of development pursued by the richest nations, the Earth's natural resources would soon be depleted, leading to irreversible

environmental destruction and conflict among peoples. Sustainable development aims to define a development model that allows every human to satisfy his or her own basic needs without harming the environment. Sustainable development is a global concern that requires individual citizens, governments, non-governmental organizations, business and researchers to adopt a new mindset.

In this respect, space and space-based technologies as those offered by SPOT Image [10] give a new perspective of our planet and provide practical solutions to the problems posed by environmental protection, healthcare, land planning, learning and access to knowledge (see Figure 2).



Figure 2: In May 1999, CNES and the French Ministry of Education, Research and Technology organized a competition for high schools on the theme of Earth observation, at the ESAP agricultural college in Toulouse. The aim of the competition was to compare 21 class research projects in all application areas of satellite imagery, including land planning, land use, mapping, oceanography, environmental monitoring and management, radiometry, coastal studies, natural hazards, meteorology and urban planning.
Source: CNES/Anne-Laure HUET,(1999)

5 France's commitment to sustainable development

Governments made key commitments in certain areas after the Johannesburg Earth Summit, in August 2002. In France, President Jacques Chirac defined five priority areas for action:

- combating global warming
- eradicating poverty
- preserving biological and cultural diversity
- developing more sustainable modes of production and consumption
- strengthening global governance

There are no "one-size-fits-all" solutions. The first step the French government has taken to lend

coherence to its actions is to draw up a national sustainable development strategy.

Coherence is achieved first of all through government leading by example. As the guardian of the public interest, if it expects a strong commitment from society in general, the government must apply the same level of commitment itself.

On 28 November 2002, for the first time ever, the full cabinet met to work exclusively on sustainable development issues and begin defining a national sustainable development strategy on the basis of the conclusions of the Johannesburg Summit and international agreements that France has signed.

Since 2003 The national council on sustainable development (CNDD) is made up of representatives from local authorities, business, trade unions, environmental protection, social and consumer associations, and experts from the world of research and education. Its 90 members help to shape and implement sustainable development policies. The inter-ministerial committee for sustainable development (CIDD) provides the link between ministries through high-ranking civil servants working with the CNDD. It thus ensures that all sectors of activity adopt sustainable development practices as part of the effort to modernize government. The CIDD adopts and monitors implementation of the national sustainable development strategy.

This strategy, elaborated and implemented by these two instances (CNDD and CIDD), allows the association of civil society to the process engaged by the government. This French strategy defined and implemented since May 2006 is organized around 6 major themes (see Figure 3). It is on domains as essential and sensitive as the education of ecology in schools, transportation or even agriculture.

Theme	Objectives
1) Economic activity	Help economic stakeholders to adopt a socially responsible approach and appropriate the environmental, social and economic aspects of sustainable development
2) Land management and planning	Make the environmental, social and economic aspects of sustainable development key elements of all local planning

	policies and actions
3) Precautions, mitigation and enforcement	Implement a policy to manage natural, man-made and health hazards effectively
4) Information, education, outreach and citizen participation	Give citizens the means and information they need to understand the issues and make their own contribution to sustainable development
5) Government leading by example	Lead by example by making sustainable development a central tenet of policy and governance
6) International action	Foster the creation of a global sustainable development alliance in order to control globalization and combat poverty

Figure 3: France's National sustainable development strategy – 6 key themes - Source: CNES - <http://www.cnes.fr/web/1695-frances-commitment-to-sustainable-development.php>

In 2007 Chirac said he was proud of his record after 12 years in office and said he planned to devote himself to campaigning for sustainable development and dialogue between cultures, and Nicolas Sarkozy the new French president said that his government would continue the effort of France's commitment to sustainable development.

6 Observing the earth at local and global scales

Since the first environmental initiatives in the 1970s [4] up to the Johannesburg Earth Summit in 2002, the global community has taken a long time to wake up to the issues at stake. Political, institutional, government, international and NGO stakeholders are now rushing to the planet's bedside and seeking solutions.

Among them, space agencies have an important role to play in supplying reliable data to compare natural resources and monitor environmental indicators across the globe.

Earth observation tools will be essential to this effort, combining ground measurement networks, space-based observation and simulation to model the

mechanisms of the Earth system at all spatial and temporal scales. A continuous stream of high-quality satellite data is helping us to refine models and generate increasingly realistic scenarios of the future.

Observing Earth more closely to enhance our understanding and plan more effectively must be central to policymaking. With this aim in mind, only satellites, from their vantage point in space, can deliver the long time series of precise, uniform measurements needed to gain a synoptic view of environmental phenomena at a global scale.

7 Space technologies working for sustainable development

Satellite imagery, oceanography, ozone monitoring, telecommunications and space science are all areas where space technologies are supporting efforts to achieve sustainable development (see Figure 6).



Figure 6: Earth observation satellite Spot 5.
Source: CNES (2006)

Earth observation is a prime contributor, even though satellite data are not usually in readily exploitable form. They are just one of many sources of information required to aid decision-making. However, the inherent features of satellites make them irreplaceable for certain tasks, such as observing remote regions, providing synoptic coverage and tracking otherwise undetectable phenomena [8]. Space technologies can provide objective information about the state of the environment and environmental degradation (see Figure 7); help to combat desertification; enhance food security; and study epidemics and improve

access to healthcare, knowledge and information, particularly in developing nations.



Figure 7: Deforestation in Brazilian Amazonia
Source: CNES (1986)

In 2007, SPOT image trains public administrations with former military imagery analysts with operational background on surveillance & Reconnaissance with its new satellites FORMOSAT-2 & KOMPSAT-2.

FORMOSAT-2, the first and only high-resolution satellite with a daily revisit capability, overcomes this obstacle to provide a new response to observation & surveillance needs. The ability to acquire repeat imagery of an area of interest every day - under geosynchronous orbit - with the same sensor, from the same angle and under the same lighting conditions guarantees a timely flow of compatible data. This solution is unrivalled today in the civil high-resolution satellite market.

KOMPSAT-2 (Korean MultiPurpose SATellite), the very high resolution of the KARI (Korean Aerospace Research Institute) Satellite was launched with success 28 July 2006 and for which SPOT Image is a distributor. KOMPSAT-2 acquires black and white pictures (Pan) of 1 m resolution and color pictures (MS) composed of 4 bands in the visible (blue, Green, Red) and the Near -infra-red at 4 m resolution. The simultaneous acquisition of Pan and MS allows, as standard, the creation of merged images at 1 m resolution. Picture shots cover an area of 15 x 15 km.

8 Conclusion

France's national sustainable development strategy has a direct impact on all CNES's activities [9]. As a government agency, CNES must play an active role in ensuring that government provides the lead in implementing this strategy—a role that is leading it to integrate sustainable development requirements and modify its working practices and programs.

CNES is building sustainable development into its programs and everyday operations. While most initiatives stem from its vocation as a national space agency, others are less closely tied to its core

competencies and concern efforts to preserve and manage the resources needed to pursue its activities. The new tri-generation plant now in operation at the Toulouse Space Centre and steps to mitigate orbital debris are good examples.

Sustainable development is a central concern for France, not just a public relations exercise. It is about maintaining a coherent policy, since it would be completely illogical to monitor the health of our planet from space, while ignoring the direct environmental impact of our activities here on Earth.

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