



# **SDAGE de Guyane**

French Guyana Water Management  
Master Plan

**2010-2015**

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**Concept note**

08/11/2010

## Subject matter, legal scope and making-process of Water Management Master Plans

Water is considered as a heritage which must be defended by everyone and therefore, a significant French and European regulation corpus frames the management of water in France.

Indeed, the Water Framework Directive (WFD) of 23 October 2000 provides for the objective of achieving, by 2015, good water status, i.e. water free from any toxic substance and of sufficient quantity, preserving human, animal and plant lives. Assessment of good water status relies on the establishment of ecological and chemical criteria.

In order to achieve this result, member States of the European Union are required to set up management plans on a "river basin" scale, updated every six years, and accompanying programmes of measures (PoM).

River basin means the area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta. French Guiana represents a single river basin.

In order to fulfil the European requirements, the French State made the choice to adapt current tools, which led to the revision of Water Management Master Plans (Schémas Directeurs d'Aménagement et de Gestion des Eaux - SDAGE).

SDAGE were established by the French water law (loi française sur l'eau) of 3 January 1992. They detail, within each river basin district located on the French territory, main guidelines for balanced and sustainable management of water resources and the administrative framework for achieving this objective.

SDAGE has been reviewed by the relevant basin committee, a consultation fora on all issues related to water, acting within a river basin district and representative for all public and private stakeholders, such as the French State, French local authorities, consumers and organisations representing economic or social interests.

The PoM, set up in parallel to each SDAGE, puts into operation provisions of SDAGE, through concrete measures and figures, designed to ensure the achievement of good water status by 2015.

In fields related to water, administrative decisions of the French State, local authorities and public organisations must be made compatible with the SDAGE provisions.

**The French Guiana SDAGE was adopted November 23, 2009.** It sets up five main guidelines covering 16 provisions and 70 detailed provisions.

According to those detailed provisions, the accompanying PoM contains 362 concrete measures. The allocation of actions per main guideline is illustrated in Figure 1. It emphasises the predominance of the "drinking water and sanitation" issue which results in more than 130 key actions.

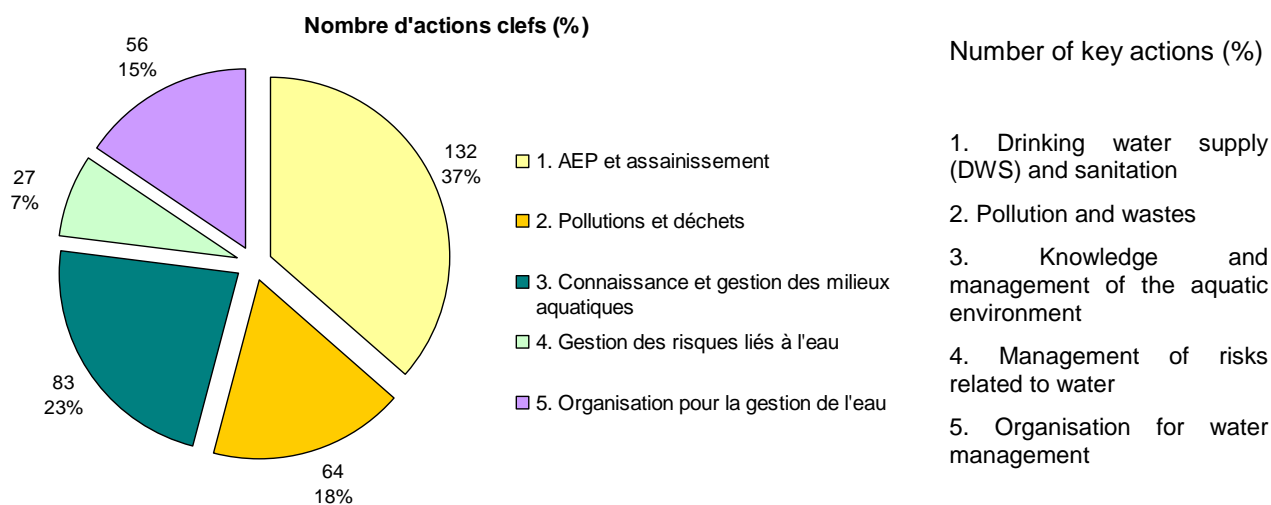


Figure 1: Number of key actions per main guideline

# Water bodies in French Guiana

In order to achieve objectives set by the WFD, freshwaters and coastal waters are divided into surface water bodies, groundwater bodies, transitional water bodies and coastal water bodies.

“Water body” means a stretch of watercourse, canal, aquifer, lake and distinct coastal area. It is a basic division of the aquatic environment designed to constitute the evaluation unit of the WFD.

Pressures and effects are identified for each type of water body. The glossary written within the framework of the WFD, defines “pressure” and “effect” as follows :

- “Pressure” means the pursuit of a human activity which may have an effect on the aquatic environment, e.g. discharge, water abstraction, production of artificial aquatic environments...
- “Effects” are the consequence of pressures on environment, i.e. increase in turbidity, loss of biodiversity, fish death, increase in frequency of certain human diseases, alteration of certain economic variables ...

A map illustrates the objectives for water status, relying on the features of water bodies.

## Surface water bodies

### Definition

Surface water bodies are significant ecological, chemical and biological elements of rivers or lakes larger than 50 ha.

Surface water bodies are divided into three categories:

- “natural” water bodies, which biological standards meet those of natural environment;
- heavily modified water bodies (HMWB), i.e. water bodies originally natural, hosting a human activity which brought about main alterations of their original features. We talk about “good ecological potential”;
- artificial water bodies, i.e. surface water bodies created by human activities. There is no artificial water body in the French Guiana river basin.

On the basis of natural criteria, 934 watercourse like surface water bodies and one lake like surface water body were identified.



Definition of surface water bodies

## Pressures

Because of the uneven allocation of the population on the French Guiana territory, pressures related to human presence (discharge of waste water, water abstraction...) have significant effects on surface water bodies located on the coastline. As a consequence, pressures on those surface water bodies are the same as those on transitional and coastal water bodies.

Most inland surface water bodies also bear pressures related to gold mining.

As far as legal gold extraction is concerned, available data are rather numerous, though they remain partial (prospecting surface, exploited surface, data relating to water quality...).

On the contrary, there is no quantified data on illegal gold mining, except for observations from the French Forest National Office (Office national des Forêts), the French Gendarmerie and the French Regional Directorate for Industry, Research and Environment (Direction régionale de l'industrie, de la recherche et de l'environnement).

Gold extraction has different types of effects on water bodies:

- effects on watercourses' morphology;
- effects on water quality and downstream habitats due to the significant amount of materials in suspension. Ponds built on legal sites limit this effect;
- chemical effects, through mercury;
- potential oil discharges in the aquatic environment

Pressures on the 934 river water bodies and the lake water body are uniform; 158 of them show a significant pressure in 2006.

### Map of the objectives for the status of surface water bodies :



## Groundwater bodies

### Definition

“Groundwater body” means a distinct volume of groundwater within an aquifer or aquifers. Twelve groundwater bodies were found in the French Guiana river basin, relying on cross-data relating to groundwater and geology in French Guiana.



**Definition of groundwater bodies**

### Pressures

The most significant parameter designed to assess the good status of a groundwater body is the level of groundwater. This level must be such as the average annual rate of the long term abstraction of water does not exceed the available resource of groundwater body.

According to known and estimated volumes, the status of French Guiana groundwater bodies is considered as “good”.

Agricultural, industrial and domestic effects on groundwater quality in French Guiana are hardly measurable because of the lack of data on:

- soil features, in particular their capacity to protect groundwater;
- the direction of water within groundwater;
- in the agriculture area, the identification of fertilizers and plant protection products used and their exact quantification;
- on sites hosting any kind of discharge and/or waste-water treatment plants, the follow-up of groundwater quantity allowing to assess the effect of those potentially polluting sources on the groundwater environment;
- the intrinsic chemical quantity of groundwater in French Guiana



However, thanks to quantitative studies on specified groundwater bodies and to the work carried out by the French Directorate for Health and Social Development (Direction de la santé et du développement social) within the framework of the follow-up of groundwater quality submitted to water abstraction, groundwater quality of the French Guiana river basin was good in 2006, except for one water body which quality was considered as mediocre.

## Map of the objectives for the status of groundwater bodies

The “good status” objective in 2015 is assigned to all groundwater bodies, for qualitative as quantitative state.

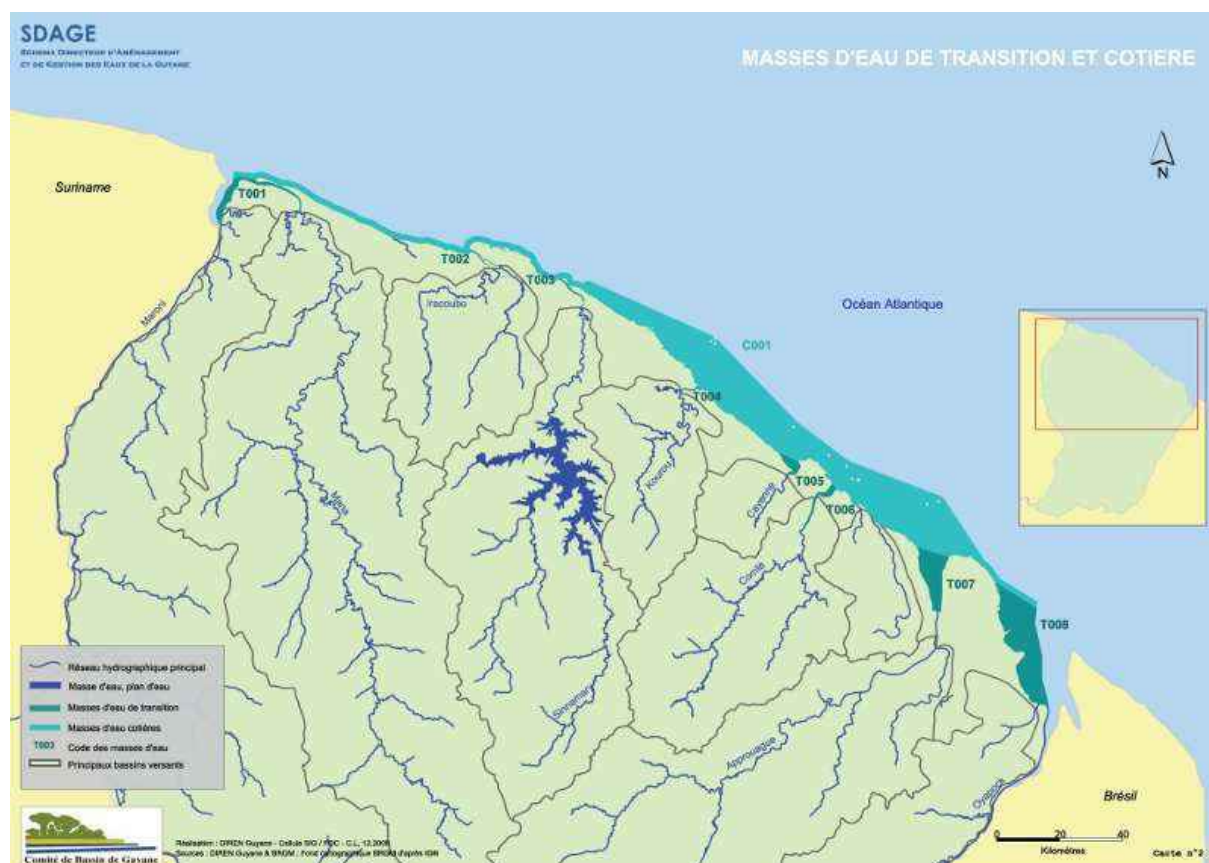
## Transitional and coastal water bodies

### Definition

“Transitional water body” means the estuaries of French Guiana rivers. Their salinity is very changeable and they are affected by the tide’s effects.

“Coastal water body” means the maritime area located off the coasts. It is affected by coastal rivers which bring turbidity, freshwater and, to some extent, contaminants.

The French Guiana district contains nine transitional and coastal water bodies, including three transitional and coastal water bodies (located on the Maroni-Mana, Approuague and Oyapock rivers) to be defined.



Definition of transitional and coastal water bodies

## Pressures

The French Guiana population and activities of any kind are mainly located on the coastline. As a consequence, transitional water bodies and, to some extent, coastal water bodies are subject to significant pressures, including:

- Waste water: discharges from waste-water treatment plants into those water bodies bring about materials in suspension likely to contain absorbed contaminants. There may also be eutrophication, which represents a significant risk for the aquatic fauna and flora. In addition, bacteriological quality of

water bodies may suffer considerable damage and involves health risks for users, such as bathers and consumers;

- Agriculture is a main pollution source, due to protection plant products (insecticides, pesticides, fungicides ...) or fertilizers (chemical fertilizers, manure...) discharged. In the event of major rain, leaching may lead to rejection of those products in the transitional water body;
- Dredging contributes to the re-suspension of particulates, which increases turbidity and reduces photosynthesis. Dredging also brings about the re-suspension of chemical and metal pollutants absorbed from sediments;
- French classified installations for environment protection (Installations Classées pour la Protection de l'Environnement) are industrial facilities presenting potential risks for the environment. They create a significant pressure on transitional water bodies, especially when they are located in their immediate vicinity;
- Fishing represents a pressure on transitional water bodies hardly quantifiable.

## Map of the objectives for the status of transitional and coastal water bodies

See map of the objectives of surface water masses above

## Five main aspects are set out in the French Guiana SDAGE

### 1. Drinking water supply (DWS) and sanitation

Significant demographic change results in an increase in the need for drinking water. Despite richness in water resources, there are difficulties in the supply, in particular on the coastline and on the Maroni and Oyapock river banks. In those areas where the number of water-production plants is restricted, additional devices are required to meet the needs. In isolated areas, water-production and water-supply plants suffer from maintenance difficulties.

Concerning sanitation, only 39% of the French Guiana population is connected to a sanitation system and 21% of it discharges its waste water into the natural environment. Existing treatment capacities remain far below the needs, in particular in Cayenne and Saint Laurent du Maroni districts. Efficiency of water treatment plants is often limited due to a lack of maintenance, inadequate water treatment systems, under sized devices considering the amount of water to be treated, bad quality of collection systems. Furthermore, there is no collection and treatment system for sewage sludge from those plants.

In addition, discharging of waste water pollutes storm water systems and may have health effects through larva development.

In French Guiana, DWS and sanitation issues are mainly related to equipment issues and may be listed as follows:

- Ensuring the quality of drinking water supply for the whole population located in urban, rural and isolated areas
- Catching up waste water collection and treatment capacities
- Developing a collection and treatment system for sewage from collective and individual sanitation systems
- Preserving devices designed to regulate the storm water flow

## 2. Pollution and wastes

Assessment of the French Guiana district has emphasised that most water bodies show risks not to achieve good water status by 2015 as a result of pollution activities including:

- gold extraction sites, most of them being illegal (mercury pollution, modification of the watercourses morphology, increase in turbidity...);
- domestic sanitation and use of fertilizers for agriculture, which are responsible for nitrogen pollution;
- combating plant diseases, root-spreading weeds and insects using plant protection products (harmful for the aquatic environment)
- shipping (accidental pollution risks, in particular for surface water bodies);
- domestic and industrial wastes (oil, solvents, metallic wastes, hospital wastes...), which may have an effect on surface water bodies and groundwater bodies

Main actions designed to ensure the good water bodies status include:

- combating illegal gold extraction. As far as legal gold extraction is concerned, the issue is to improve reconciliation of economic development and enhancing of the aquatic environment preservation;
- ensuring preservation of water against fertilizers and plant protection products, through enhancing agricultural and forestry practices;
- setting up a waste management policy at the French Guiana scale

## 3. Knowledge and management of the aquatic environment

Assessment of the French Guiana district has emphasised the lack of data useful to assess and quantify the effect of human activities on the aquatic environment.

As a result, considering the dynamics of French Guiana development and the increased pressures on the aquatic environment, it becomes necessary to set up conservation measures for protection of environment and species.

Main actions designed to ensure the good water bodies status include:

- remedying the lack of data related to environment and establishing parameters for reference and quality standards;
- applying in priority the conservation provisions of the French Environment Code (Code de l'environnement)
- setting up a balanced and integrated management of water resources and the aquatic environment and determining accompanying actions to be initiated

## 4. Management of risks related to water

Management of risks related to water represents a central theme of the French Guiana SDAGE and a major issue for French Guiana authorities in charge of protecting goods and people.

The French Guiana SDAGE reaffirms the main regulation principles related to management of risks related to water in order to increase partners' awareness of importance of issues related to this management (safety of goods and human life, economic and social life).

Issues related to this theme put greater emphasis on two types of risks:

- health risks (non-compliance of bathing water, water-borne diseases, mercury pollution)
- environmental risks (flooding, soil and coastline erosion, ground motion...)

In addition to French Guiana programmes and plans to reduce risks, the French Guiana SDAGE also deals with the enhancing of knowledge and prevention of risks.



## 5. Organisation for water management

Organisation for water management is a cross-cutting theme of the French Guiana SDAGE and plays a significant part in the assessment of areas related to the other themes.

The French Guiana SDAGE aspires to reaffirm main regulation principles dealing with management of data on water, to propose an organisation designed to make their application compatible with the French Guiana specificities, to designate objectives with a view to closing existing loopholes and optimizing the action of water services and to indicate appropriate ways to achieve them.

At last, new challenges from the Water Framework Directive and the national strategy for sustainable development lead to strengthen, develop and ensure the continued existence of river basin governance and local management policies in view to achieving good water status.

This guideline mainly deals with the following issues:

- Establishing a Water Information System designed to supply numerical services to French Guiana stakeholders and to answer the need in knowledge;
- Structuring the water pricing system in French Guiana and strengthening the “polluter pays” or “consumer pays” principle through the recovery of costs of water services;
- Introducing a transparency principle for costs related to drinking water production and supply, costs of water resources, damage to environment and ecosystems caused by water use, compensatory costs related to environment degradation...;
- Enabling synergy between stakeholders and information and participation of the public, while the governance supports protection of environment and the sustainable use of natural resources;
- Communicating and making decision-makers and the public aware of issues related to water management and protection of the aquatic environment

## Water management in French Guiana, a transboundary issue

The French Guiana river basin is defined, on its eastern side, by the Oyapock River, a border river separating French Guiana and Brazil which is not a member of the European Union.

The achievement of the Water Framework Directive objectives thus mainly depends on actions taken by Surinam, in particular on the good water status of tributaries flowing into the border river.

In order to ensure consistency of actions dealing with prevention of risks related to shipping and conservation of the aquatic environment, it is essential that both States share a common vision on those areas.

In this prospect, the French Guiana SDAGE proposes:

- the definition of common rules for managing the border river, relying on framework conventions concluded between France and Brazil, and on agreements between, on the one hand the French Guiana nature park and the Amazon national park and on the other hand the Cabo Orange national park (detailed provision 5.2.5)
- the building of wedges, docks and devices designed to overcome natural rock obstacles (“sauts”), the regulation of driving, the promotion for the use of less pollutant engines (detailed provision 2.1.6)
- the making up of integrated development plans designed to develop and promote local economic activities, to protect goods and people while limiting the effect of the transport of dangerous goods, to preserve river banks, the aquatic environment and the related species and to promote methods for enhancing rivers (detailed provision 3.2.5)

## Cost of the programme of measures

In order to support the objectives of the programme of measures to be achieved between 2010 and 2015, an economic assessment of key actions relying on consultations of the economy work group was drawn up.

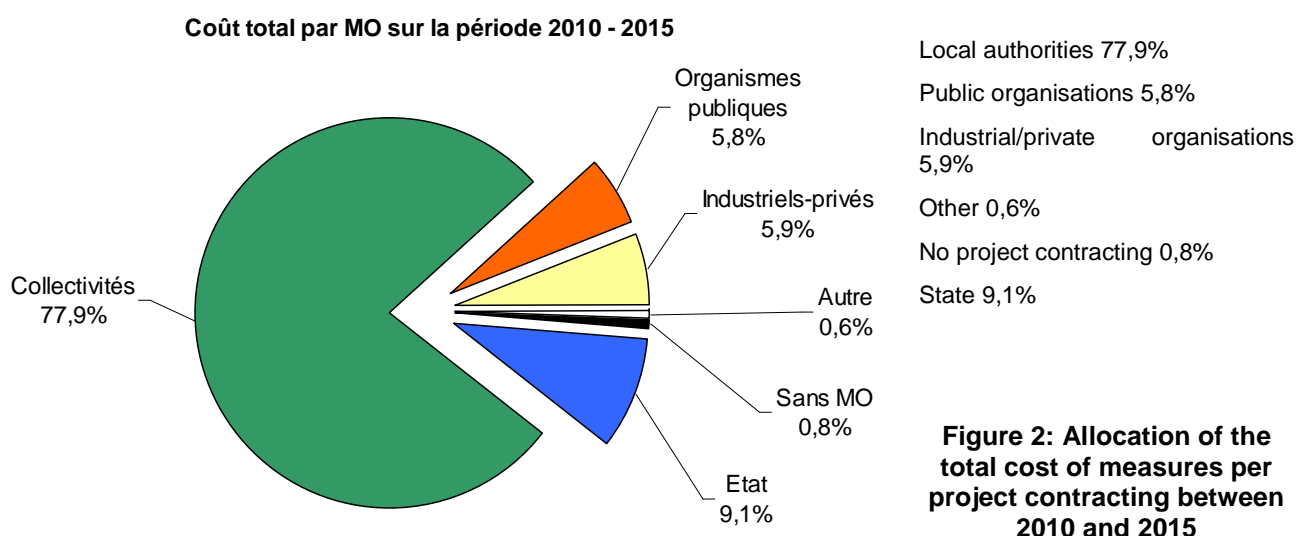
The total average annual cost of actions from the PoM and the SDAGE is € 51 million per year (Table 1), which represents a total investment and functioning cost of € 306 million between 2010 and 2015.

Main guidelines	WFD : Basic measures	WFD : Additional measures	Non WFD measures	SDAGE cost	total
1. DWS and sanitation	25 028 724 €	3 901 687 €	10 594 748 €	39 525 159 €	
2. Pollution and wastes	22 500 €	4 366 361 €	1 449 821 €	5 838 682 €	
3. Knowledge and management of the aquatic environment	76 478 €	940 439 €	1 267 428 €	2 284 345 €	
4. Management of risks related to water		6 739 €	1 149 038 €	1 155 777 €	
5. Organisation for water management	13 500 €	316 487 €	1 940 220 €	2 270 207 €	
Total	25 141 201 €	9 531 713 €	16 401 254 €	51 074 169 €	

**Table 1: Total average annual cost (euros p/year) per main guideline**

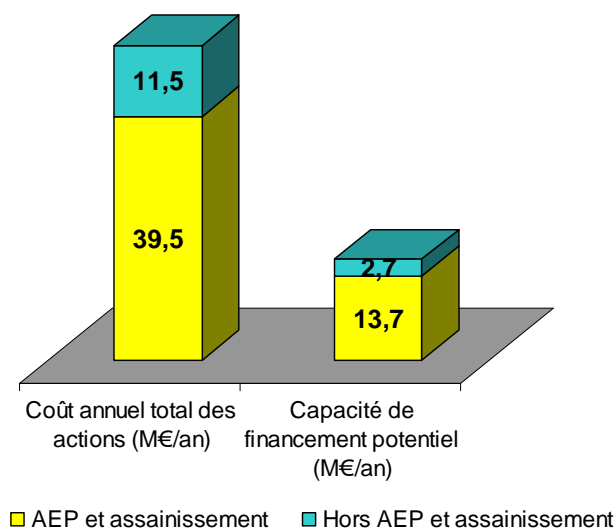
The 2009-2015 programme costs may also be presented considering the project contracting (PC) through staggering costs on six years (Figure 2). The total cost for local authorities project contracting is € 238 million, including almost € 184 million allocated to the basic and additional measures of the PoM.

This cost represents 78% of the SDAGE total cost. Nevertheless, it must be noted that estimated costs represent total costs which will be potentially managed by project contractors and do not involve the financing of all the estimated costs. For instance, investment costs for actions taken under local authorities project contracting may be co-financed by a contribution from Europe and the French State through the operational programmes ERDF and EAFRD.



The total financing of all measures which can be made available for use is € 16.4 million per year. As emphasised in Figure 3, this amount covers only 32% of the total annual cost of the SDAGE programme of actions and the WFD PoM, i.e. € 51 million per year.

The financing of basic and additional WFD measures represents 47%. In this prospect, some additional € 18.3 million would be necessary, including € 15.2 million allocated to basic measures dealing with DWS and sanitation.



Total annual cost of actions (M€ p/year)  
 Potential financing capacity (M€ p/year)

**Figure 3: Comparison between the annual cost of the SDAGE programme of actions and the potential financing capacity**

The average annual cost of the PoM related to the French Guiana population (208 000 people according to INSEE in 2006) represents € 167 per inhabitant and per year. Comparing this cost to the estimated average cost allocated to metropolitan river basin districts (which is € 120 per inhabitant and per year), it appears the cost in French Guiana is 1.4 times that of the cost in metropolitan France. This additional cost explains to a large extent that French Guiana is falling further and further behind in infrastructures for drinking water and sanitation, to which more than 77% of the SDAGE total cost is allocated.