RIBATEJO - PORTUGAL


qualitropic
INNOVATION &
RESSOURCES NATURELLES
TROPICALES
Pépinière du Théâtre
Sapef Paysage
cirad
GERMENDEMIK

EXECUTIVE SUMMARY

- **Group presentation**
- **Project context and initiative**
- **GERMENDEMIK**
  - Objectives
  - Innovations
  - Partners
  - Means and budget
- **Expected results**
  - Economic
  - Scientific


Headquarters
St Gilles les Bains

Group Fages

4 companies operating around two fields of competences :

Plant Production

&

Creation - Consulting in regional & urban development

Group Fages

Pépinière du Théâtre

Plant Production
&
Creation- Consulting
in regional & urban development

PUBLIC – BtoB

- ❖Urban & regional development
- ❖Specific works & plant engineering
- ❖Recreative & sportive space development

PRIVATE – BtoC

- ❖Garden lay out
  - Private individuals
  - Comapnies
  - Special events
- ❖Consulting and garden product sales, decoration and pet shop

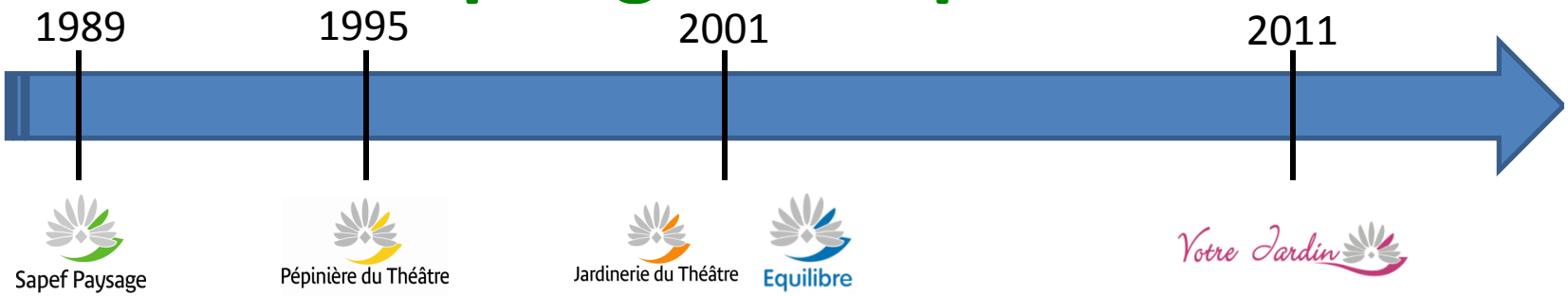
Sapef Paysage

Equilibre

Votre Jardin

Jardinerie du Théâtre

Group Fages Companies



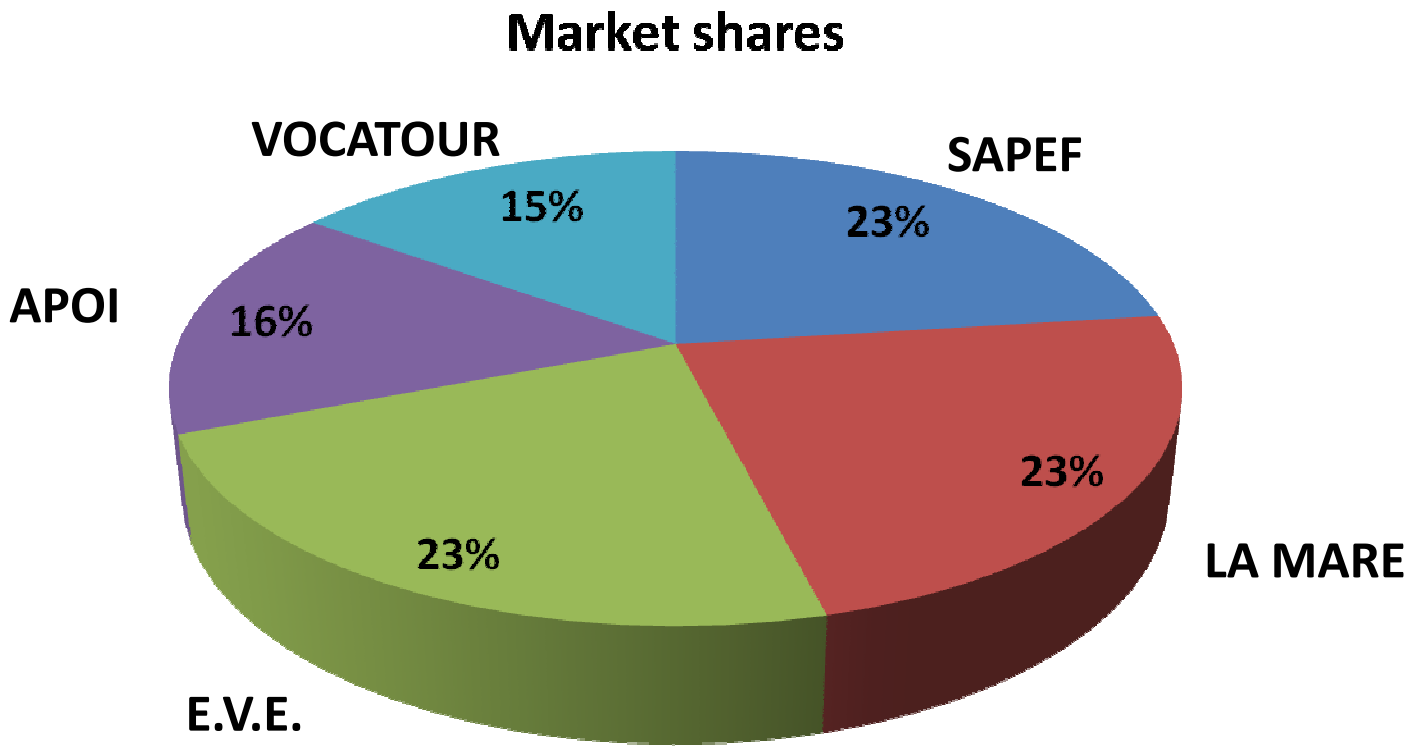
2010

- 6 300 K€ turnover
- 53 employees
- 200 000 plants
- 240 work sites
- 10 000 Clients for the plant nursery

CONTEXT

Endemic & indigenous plant market

Competitive intensity:
Regional & urban development companies with nurseries



CONTEXT

Sustainable development using endemic & indigenous plants

A favorable environment for the development of indigenous & endemic plant production and for innovation

Politic:

- Programme BEST
- Convention on biologic diversity 1992
- Stratégique Plan in 2010
- Grenelle of environment
- Elargissement de la « Liste Verte »
- Regional Politicy (Innovation / Green jobs)

Economic:

- Region with one of the highest growth rate
- Market instability
- Difficulty of financing
- Unemployment
- Large public market

CONTEXT

Sustainable development using endemic & indigenous plants

A favorable environment for the development of indigenous & endemic plant production and for innovation

Social:

- Heavy trend to « go back to natural »
- Development of associations
- Emergency of citizen initiative (cleaning riverbanks, tree plantation,…)

Technologic:

- Propagation methode non exhaustive
- Missing land plot data
- Hydroseeding application???

Environmental:

- Mountain National Parc
- World heritage classified by UNESCO
- Invading species problematics

CONTEXT

Sustainable development using endemic & indigenous plants

La Reunion is vulnerable : 237 rare endemic species among which 37% are endangered species

DAS	Turnover	Group market share	Indigenous part	TOTAL	Observations
Plant supply	660 K€	25 %	80 %[1]	**2 100 K€**	[1]Conceptor research

A market estimated at 3 000 K€/year

	Market size	Plant share	Indigenous part	TOTAL	Observations
Landscape & garden engineering	3 300 K€[3]	10 %	3 %	**10 K€**	[3]Internal market study

Estimation not accounting for the natural restoration of the Mountain National Park after 1 000 Ha of forest burnt!

CONTEXT

Sustainable development using endemic & indigenous plants

Professional partnership with real estate companies & local collectivities

Plant engineering work on “green building”: thermal gain of 7°c with a plant covered roof compared to regular roof (concrete covered roof is at 80° with 40°c in the rooms under; here a gain of 7°c provides 33°c in the rooms

CONTEXT

Sustainable development using endemic & indigenous plants

Valued expertise in plant production of indigenous plants (nursery selected for the project LIFE+ «COREXRUN» production of 100 000 plants with 46 endemic species to restore 9 hectares of land)

CONTEXT

Sustainable development using endemic & indigenous plants

Recognized know how in specific works, plant engineering and particularly in hydro-seeding

GERMENDEMIK PROJECT

OBJECTIVES :

- Widening the range of endemic and indigenous plants in the nursery

- Developing specific mix for hydro-seeding based on endemic and indigenous seeds adapted to the different zones to restore

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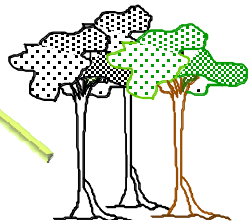
INNOVATIONS :

Genetic Diversity
Natural/EnvironmentArboretum ?

Vegetative Plant Propagation

Young plant



Adult plant

Flowering

Floral Biology
Phenology ?
Maturity Signs ?

Separation

Growth?
Pathogen Sensibility ?
Requirements
(light/substract) ?

Plantule

Production

Fruits - Seeds

Treatment ?
Viability ?
Dormancy Type ?

Preservation

Dessiccation ?
Temperature ?

Germination raised

Germination Temperature ?
Photosensibility ?
Dormancy Raising ?
Germination Rate?
Mix Composition?

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INNOVATIONS :

% Seeds ?
% Mulch?
% Fertilizers?
% Fixators?

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PARTNERS :

Pépinière du Théâtre

- Expertise in seeding technique
- Experimentation zone
- Economic valorization of the research results

Sapef Paysage

- Expertise in hydro-seeding technique
- Economic valorization of the research results

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- Expertise in plant species
- Indian Ocean plant network
- Mother plant blocks
- Laboratory Experimentation
- Experimentation zone
- Methodolgy

GERMENDEMIK PROJECT

OTHER PARTNERS ?

Knowledge and data collection:

APN

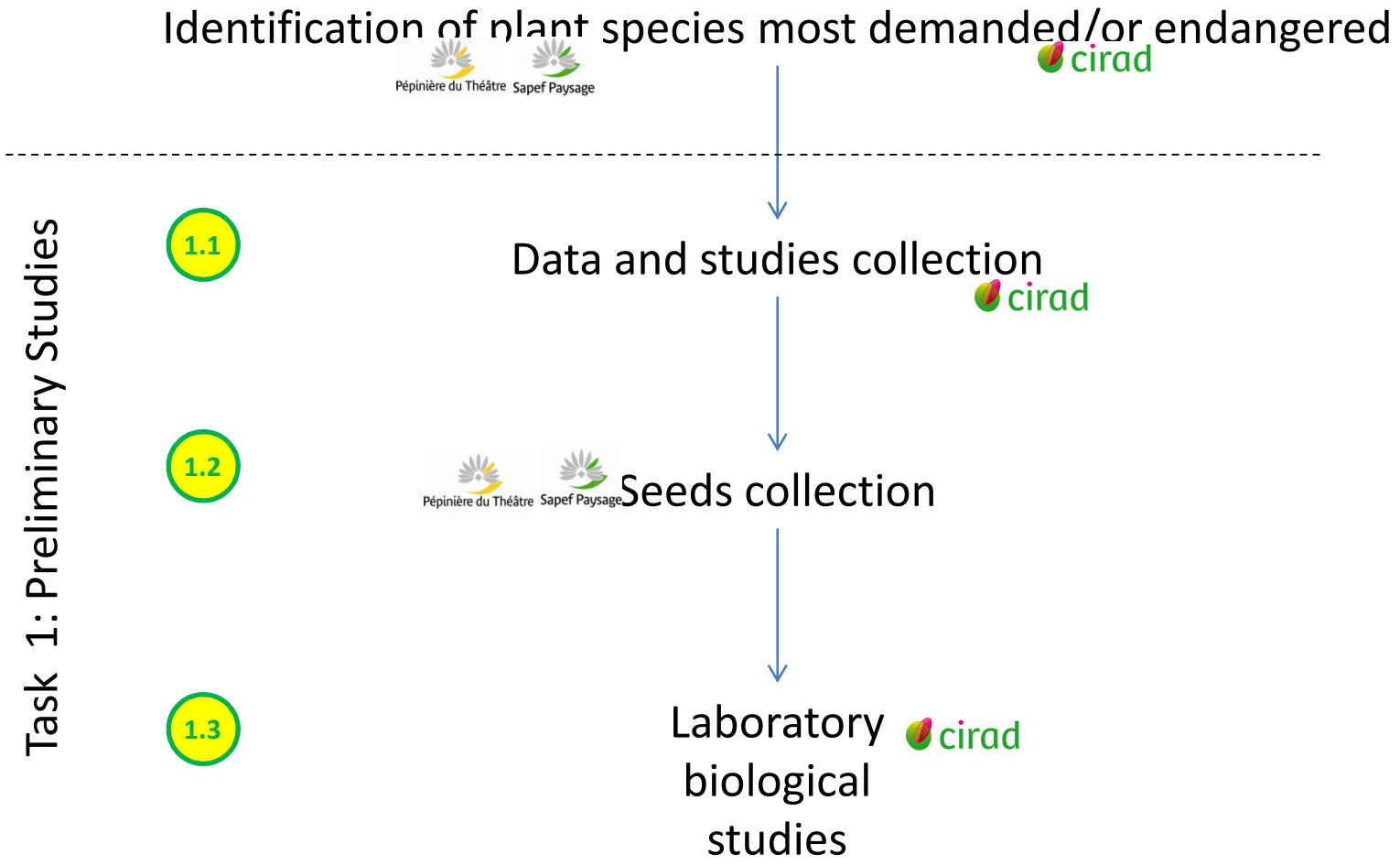
La Réunion
Parc National

Conservatoire Botanique National
MASCARIN

Office National des Forêts

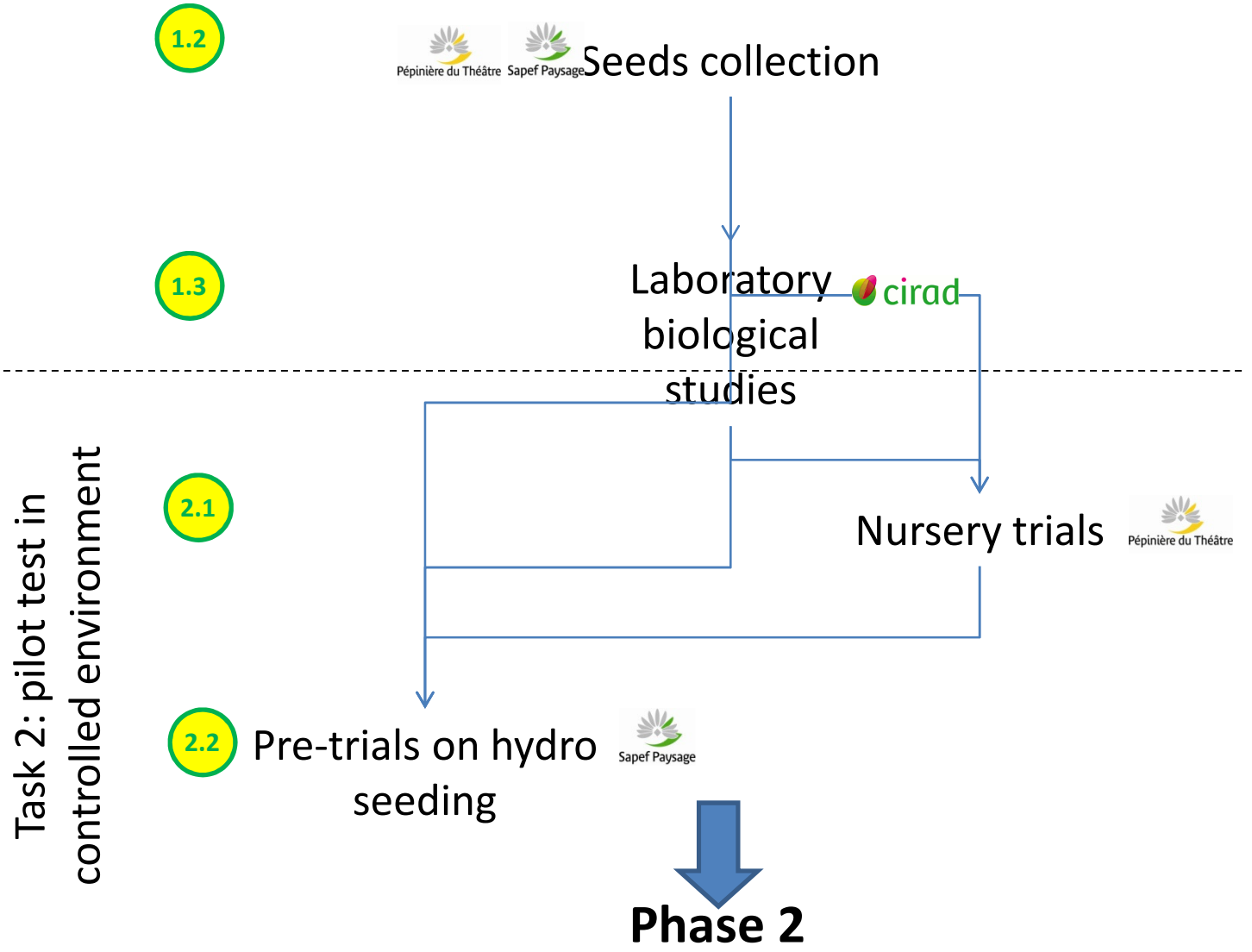
GERMENDEMIK PROJECT

MEANS : Action plan



GERMENDEMIK PROJECT

MEANS : Action plan



GERMENDEMIK PROJECT

MEANS : Human Resources

Pépinière du Théâtre

- 1 agricultural engineer
- 1 nursery director
- 1 head of cultivation
- 1 doctor student
- Horticultural workers
- 1 student in management

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- 1 civil engineer
- 1 head of maintenance
- 1 team leader
- Green space creation workers

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- 1 research director
- 1 researcher
- 1 technical assistant
- Agricultural engineer students

GERMENDEMIK PROJECT

BUDGET :

ACTION	PDT	SAPEF	CIRAD	TOTAL
Coordination / project management	112 K€			**112 K€**
Knowledge data collection			8 K€	**8 K€**
Collection and conservation	46 K€		1 K€	**47 K€**
Laboratory research	36 K€	1 K€	112 K€	**149 K€**
Nursery trials	142 K€		25 K€	**167 K€**
Hydroseeding trails	35 K€	39 K€	20 K€	**94 K€**
TOTAL	**371 K€**	**40 K€**	**166 K€**	**577 K€**

EXPECTED RESULTS

ECONOMIC :

↗ Group Competitiveness :

↗ Germination rate = ↘ Harvesting and storage cost

Conservation technqiue = Protection against climatic factors

↗ Range of available plants for targeted markets

Creation of new seed mix for hydro-seeding technique

EXPECTED RESULTS

ECONOMIC:

↗ Employment:

Pépinière du Théâtre

- 1 Doctor
- 1 Commercial
- Horticultural workers

Sapef Paysage

- 1 Commercial
- Workers in green space creation

EXPECTED RESULTS

SCIENTIFIC :

- Acquisition of further knowledge on endemic and indigenous species from Reunion Island
- Valorization through publications in international scientific magazines or scientific popularization
- Establishment of germination cards
- Patents on hydroseeding mixes

EXPECTED RESULTS

SOCIAL AND ENVIRONMENTAL:

Projet contribution :

- Restoration of sites invaded by plant plagues
- Preservation of land biodiversity
- Upholding of Reunion Island Mountain as a UNESCO World Heritage

Projet impacts:

- Implication of different managers on natural environment restoration
- Implication of populations and local associations in the set up of seeding gardens


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LES PÔLES DE COMPÉTITIVITÉ

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Biotechnologies

Project RUNINNOVATION

Bambou phyto-remediation to support sustainable development in tropical regions

PHYTOREM

LES PÔLES DE COMPÉTITIVITÉ

Project RUN INNOVATION

OBJECTIVES:

- Adapt the bamboo phyto-remediation technology (BAMBOU-ASSAINISSEMENT®) to tropical climate.

- Select adapted species for the effluent treatment and its valorization.

- Implicate local actors.

- Scientific validation.

Project RUN INNOVATION

Project partnership:

PHYTOREM → Set up experimentation site; Management of intrants; Bamboo measurements

CIRAD → Effluent analysis of effluents; Lixiviate analysis; Soil analysis

qualitropic → Project coordination

Bamboo field of Guillaume → Bamboo Supply and plantation

Agricultural Lycée of Saint Joseph → Site and pig lixiviate supply

Région Réunion

Département de la Réunion

Région Provence-Alpes-Côte d'Azur


OCTOBER 2008


MARCH 2009


MARCH
2009


MARCH 2010

Presentation
of the pilote site in Saint-Joseph

3 land plots :

- Brut lixiviate plot (250 m² ; 40 bamboos)
- Centrifugated lixiviate plot (250 m² ; 40 bamboos)
- Witness plot (clear water ; 100m² ; 15 bamboos)

By-pass recuperation from the station (brut lixiviate/ centrifugated lixiviate)

Quantity of lixiviat supplied by plot

↳ 268 mm soit 67 m^3 sur 13 months (June 2008 to Nov. 2009)

= lixiviate supply of 247 mm/year

Conclusions

- Positive effect of the lixiviate supply on bamboo growth.
- Very high nitrate elimination yield: 94%
- Very low level of nitrate draining :1 to 2 % only.
- No phosphor draining: 50% directly assimilated by bamboo plants and 50% stocked in the soil.
- Low potassium draining: ~ 6 % of the supply as the bamboo is a high potassium consumer (high growth rate plant).

Programme results

❖Selection of species adapted to the environment and produced locally.

❖Valorization for semi-collective decontamination in tropical environment. (a first worksite opened in Saint Joseph with the SIDR collaboration).

❖Creation of a unique solution technique for the CPPR in the treatment of pig lixiviate.

❖Creation of the company PHYTOREM in Reunion Island (PHYTOREM RÉUNION) with a forecast of important job creation in 2012 / 2013.

❖Patent deposited BAMBOU-ASSAINISSEMENT® for the tropical

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