



**UPSCALING OF THE NATIONAL  
HOUSEHOLD BIOGAS PROGRAMME  
(PNB-SN)**

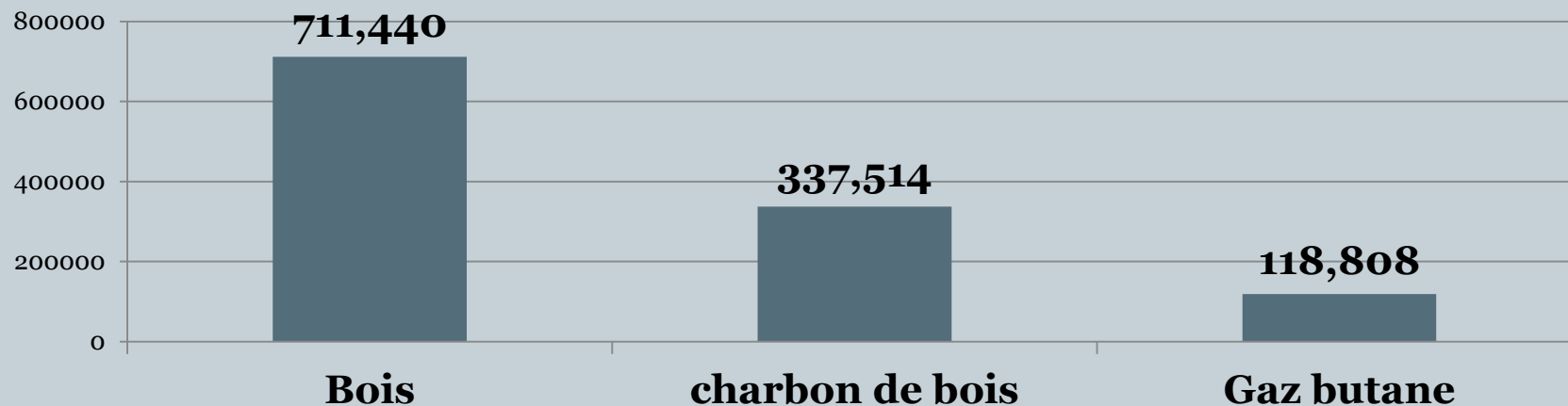
***Dr Abdoulaye FALL***

**SEPA-DESERTEC International Conference 2015  
Senatssaal of Justus Liebig University, Main Building  
Giessen, 10-11.12.2015**

# I- BACKGROUND

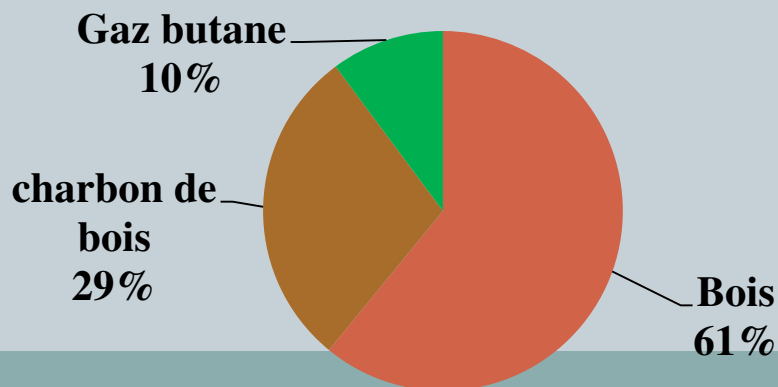
Final consumption of fuels by households en TEP (2013)

SOURCE: PROGEDE 2 surveys



Final consumption of fuels by households in % P (2013)

Source: PROGEDE 2 surveys



# I- BACKGROUND

	Fire wood (tonnes)	Charcoal (tonnes)	Butane gas (tonnes)
Dakar	60 521	213 443	68 494
Thiès	306 014	62 310	15 826
Diourbel	120 634	49 169	4 578
Fatick	107 886	19 710	2 340
Kaolack	122 427	33 422	3 840
Kaffrine	114 599	13 863	410
Louga	153 062	6 405	2 039
Saint Louis	107 390	27 174	5 038
Matam	124 840	568	1 530
Tambacounda	146 975	19 015	1 141
Kédougou	28 241	1 294	140
Kolda	175 140	12 524	592
Sédhiou	74 800	4 321	311
Ziguinchor	92 690	19 030	1 722
<b>TOTAL GENERAL</b>	<b>1 735 219</b>	<b>482 248</b>	<b>108 001</b>

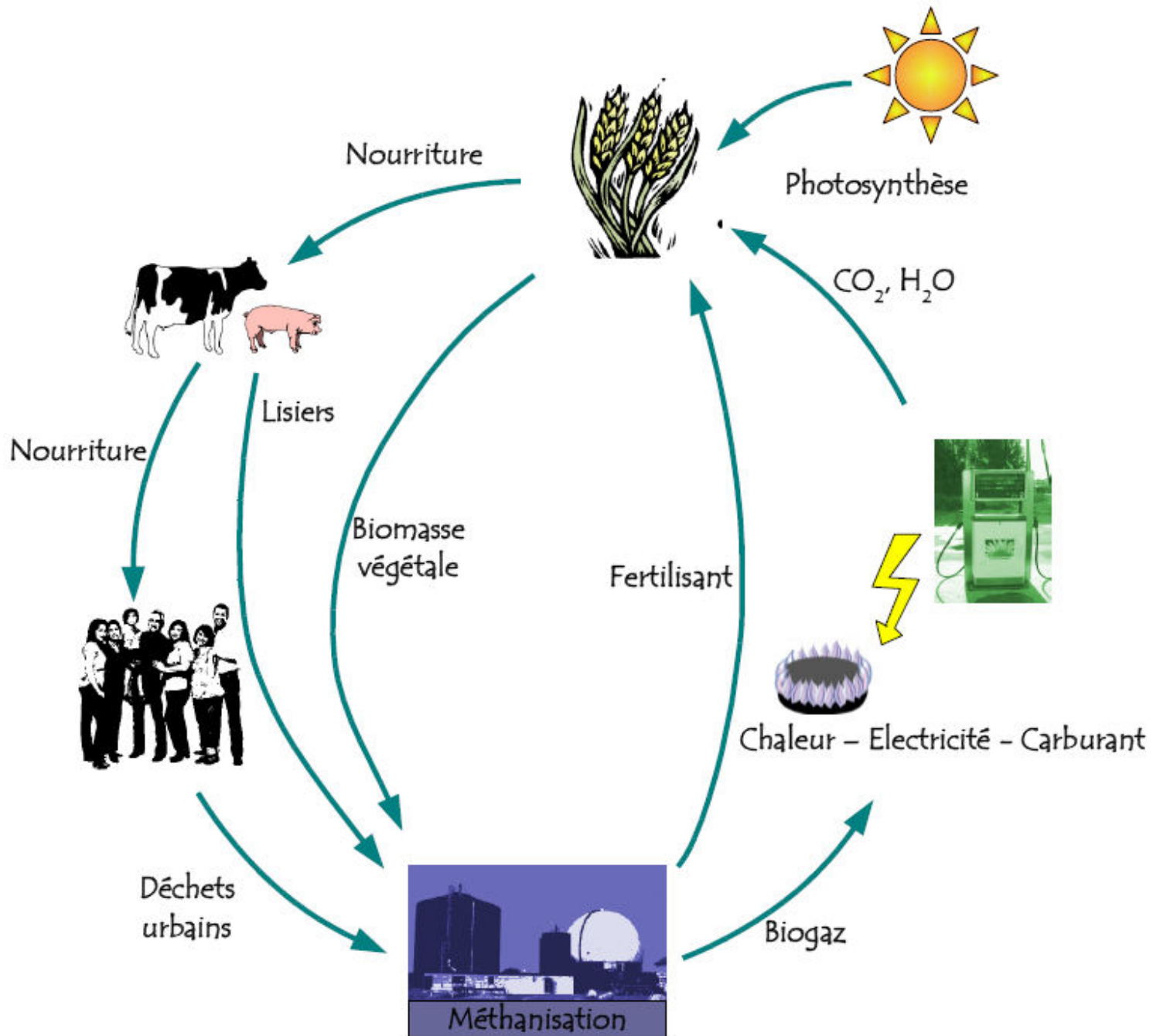
Final consumption of fuels by households (2013) Sources: PROGEDE 2 surveys

- 40 000 ha/an of destroyed forest (communication nationale)
  - =► **Rash reduction** of these fuels
  - =► Increased need and search for **sustainable alternatives** to usual domestic energy sources

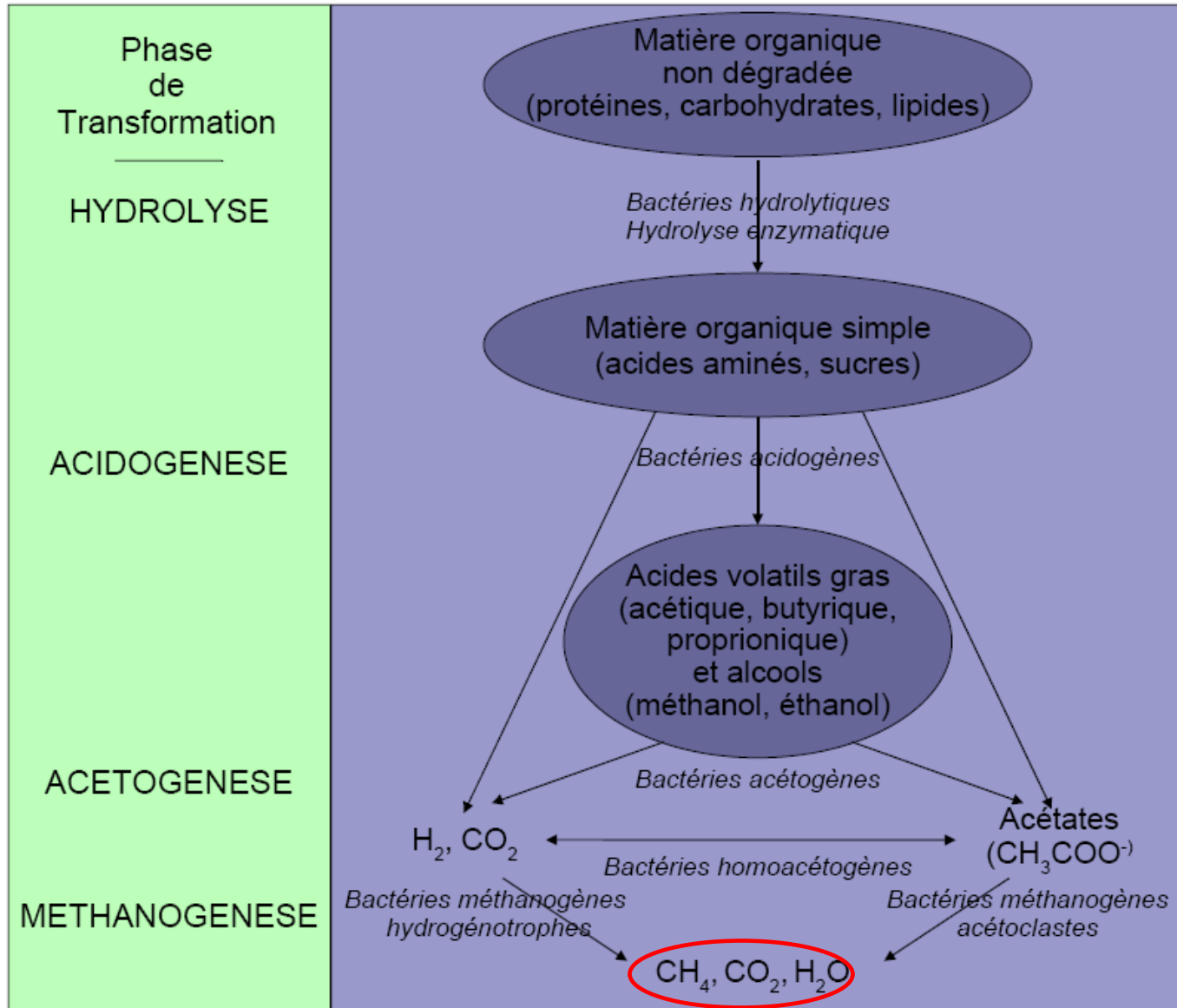
# I- BACKGROUND

PNB-SN is a part of the initiative « *Biogas for a better life* » developed by the dutch cooperation and based on the successuf experience in Nepal





# I- BACKGROUND



# I- BACKGROUND



PNB-SN has started with a pilot phase 2009-2013 aiming =▶ to build **8 000 individual biogas units** at the household level in order to reduce pressure on natural resources (fire wood which still is the main primary energy source through the country)

- BUT, during this period only **587** rural households have their own biodigesters

# I- BACKGROUND



Several reasons can explain these « bad » results:

- **The price of the biodigester unit : between about 700 EUR to 1.100 EUR (while incomes for rural household are about 250 EUR/month)**
- **Inadequate technical capacities of actors (masons, households, etc.)**
- **Limited access to water**
- **Livestock and agriculture generally extensive ( more in the center and north of the country), and weak integration of the two sectors**
- **Lack of organization between the producers groups**



## II- OBJECTIFS, EXPECTED RESULTS AND IMPACTS

### MAIN OBJECTIF

*Develop and disseminate biodigester as modern and alternative solution of renewable energy for rural areas, and ensuring the viability and sustainability of biogas market*

### SPECIFIC OBJECTIFS

1. Consolidate and expand the achievements of the pilot phase;
2. Increase access to 9,500 rural households and 500 school canteens for energy services for cooking and lighting;
3. Strengthen the technical capacities of actors in supply and for demand ;
4. Diversify and strengthen partnerships to improve soil fertility.

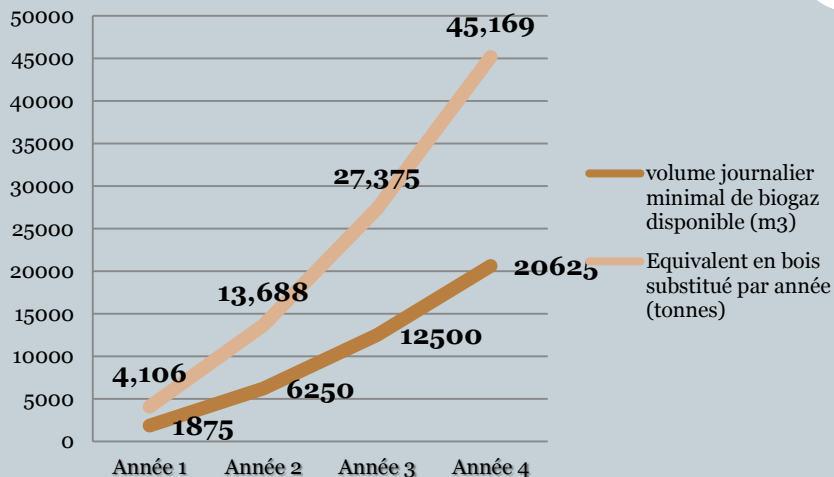
## II- OBJECTIFS, EXPECTED RESULTS AND IMPACTS

### EXPECTED RESULTATS

1. The achievements of the pilot phase are consolidated and expanded
2. Solutions are addressed to the constraints
3. Access to modern energy services for cooking is effective for 9.500 households and 500 canteens through the biodigesters
4. By the end of the programme 92% of these biodigesters are in operation
5. The living conditions of affected women are improved
6. The installation costs are reduced
7. The capacities of stakeholders and beneficiaries are reinforced
8. The development of rural entrepreneurship is reinforced
9. Access to finance has improved
10. The productivity of livestock and agriculture is growing

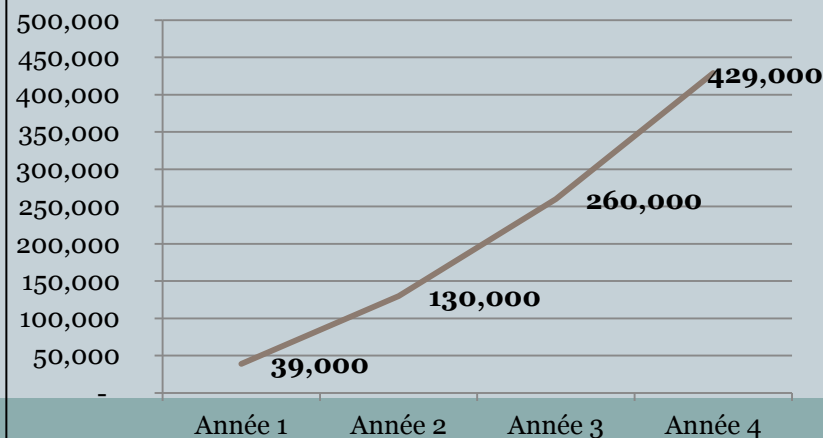
# II- OBJECTIFS, EXPECTED RESULTS AND IMPACTS

## SAVING OF WOOD



## IMPACTS

### Annual production of organic fertilisers (tonnes)



### **III- MAIN ISSUES OF THE PNB-SN (2015-2019)**

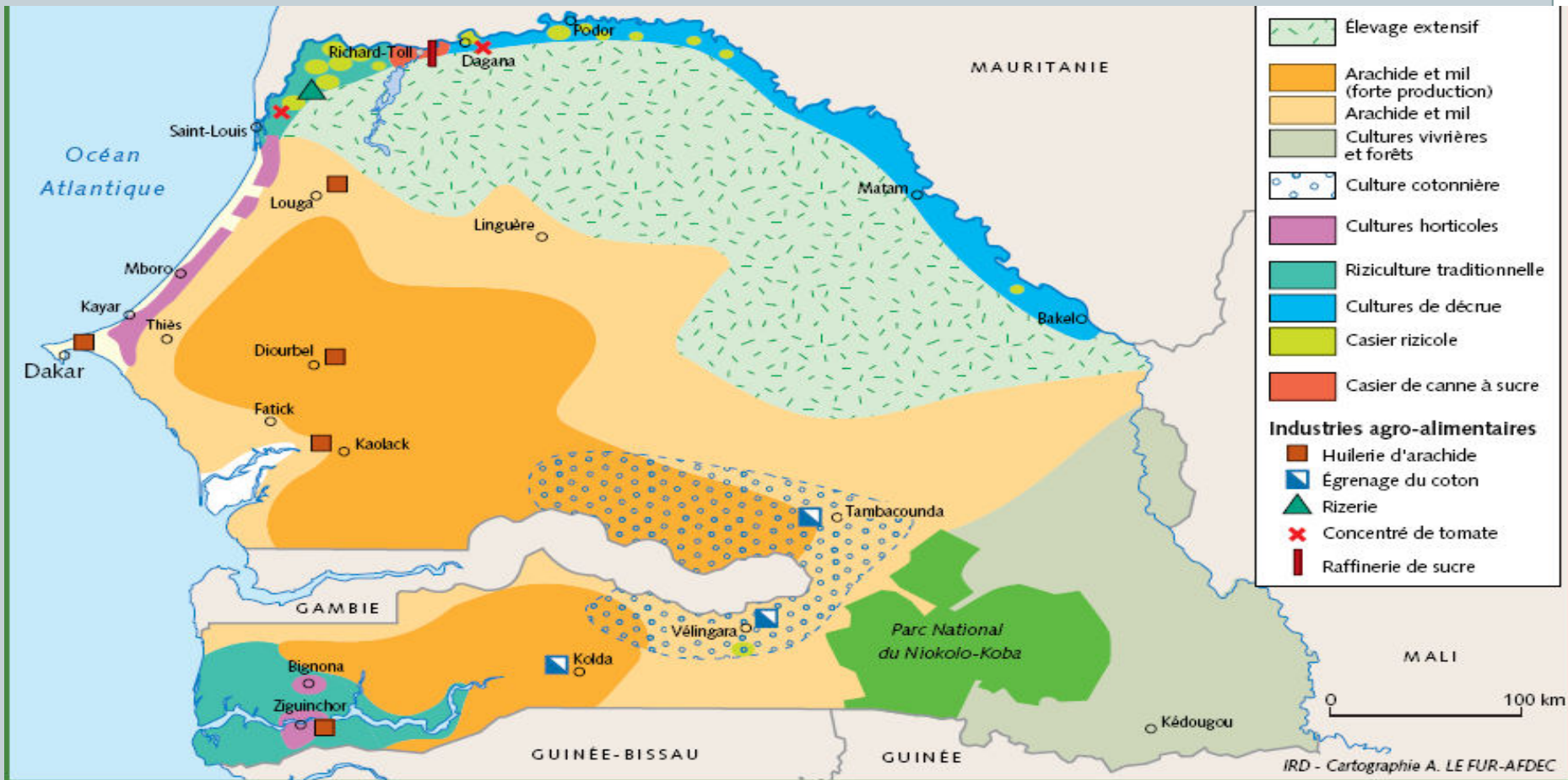


- **Increasing energy supply for cooking and lighting in rural households**
- **Improving living conditions of women and children in rural areas**
- **Production of organic fertilizer to improve soil fertility**
- **Improving agricultural productivity**
- **Food safety**
- **Poverty reduction**



# POTENTIELS BENEFICIAIRES

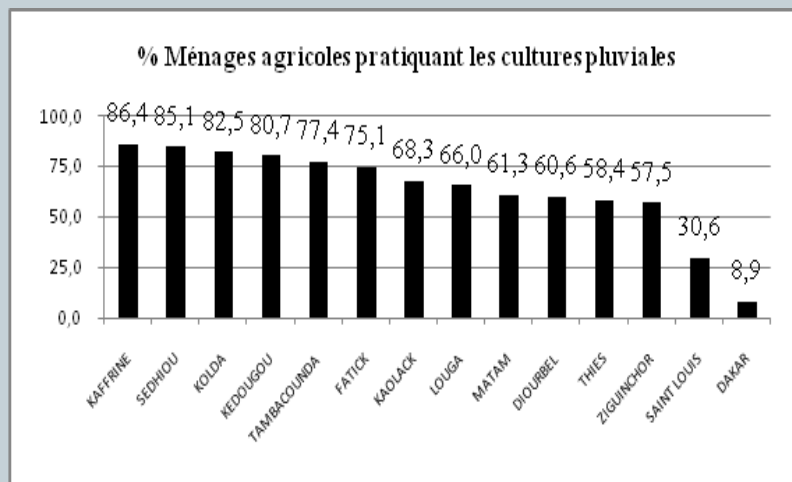
MAIN TARGET: HOUSEHOLDS WITH AGRICULTURAL ACTIVITIES



(SOURCE: RPGHAE 2013)

# POTENTIELS BENEFICIAIRES

## MAIN TARGET: HOUSEHOLDS WITH AGRICULTURAL ACTIVITIES



% OF FARMERS HOUSEHOLD	IRRIGATED CROPS without VEGETABLE CROPS OUT	VEGETABLE CROPS	FLOOD CROPS (EXAMPLE: RICE)	ARBORICULTURE
<b>30 to 20%</b>	SAINT LOUIS	SEDHIOU	MATAM, SAINT LOUIS	ZIGUINCHOR, SEDHIOU
<b>20 to 10%</b>	MATAM	ZIGUINCHOR, KEDOU, SAINT LOUIS, THIES, FATICK, KOLDA		

(SOURCE: RPGHAE 2013)

# POTENTIELS BENEFICIAIRES

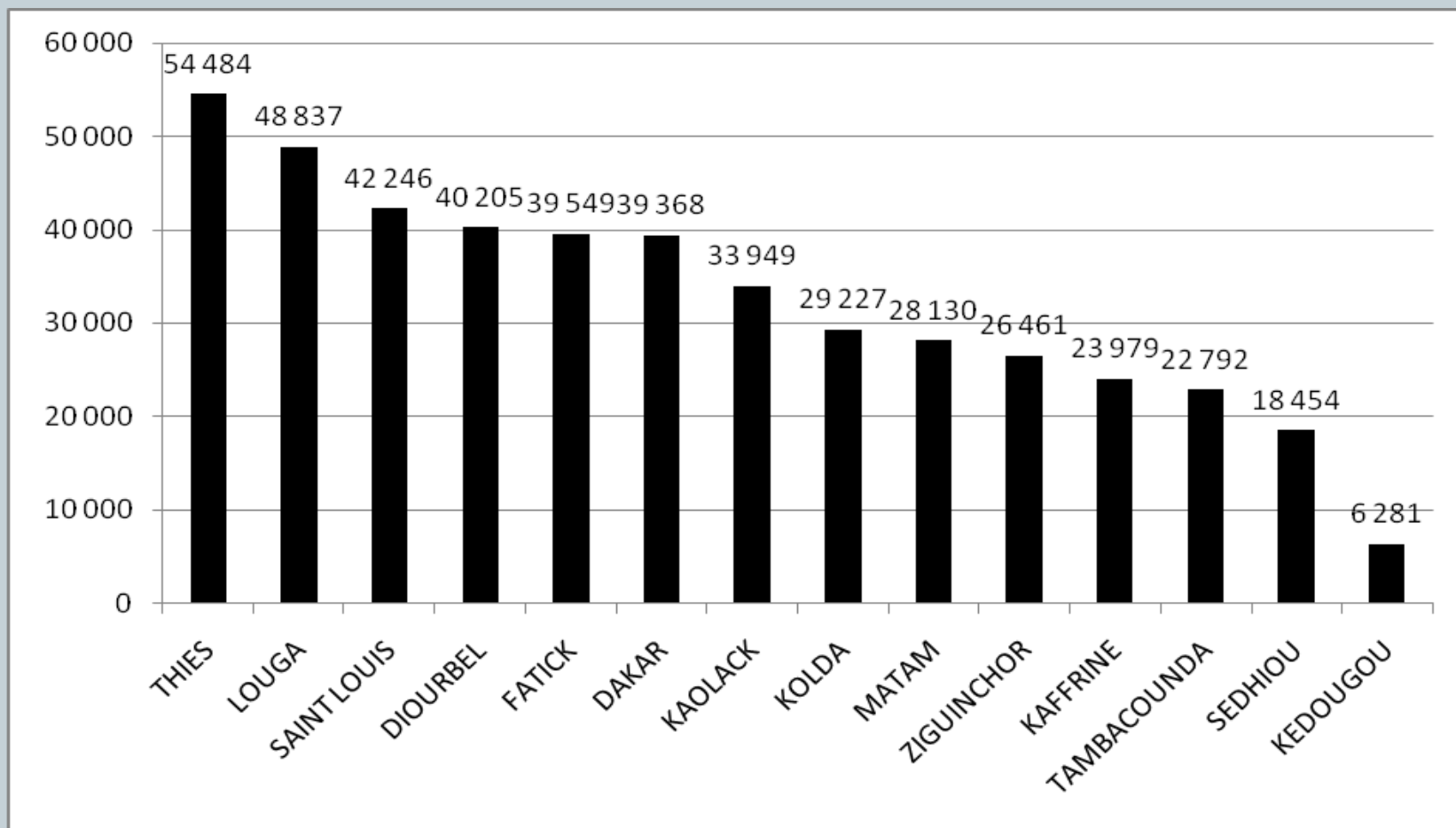
## MAIN TARGET: HOUSEHOLDS WITH AGRICULTURAL ACTIVITIES

REGION	Y - a- t- il au moins un membre du ménage qui pratique une activité agricole au sens large (SOURCE RPGHAE 2013)		Ensemble	% FARMER HOUSEHO LDS	(SOURCE RPGHAE 2013)	HOUSEHOLD SIZE		
	Non	Oui			REGION	URBAIN	RURAL	MOY
DAKAR	402 587	63 600	466 187	13,6	DAKAR	6	8	6
ZIGUINCHOR	29 711	42 541	72 252	58,9	ZIGUINCHOR	7	7	7
DIOURBEL	84 148	63 919	148 067	43,2	DIOURBEL	9	9	9
SAINT-LOUIS	34 215	71 001	105 216	67,5	SAINT LOUIS	8	8	8
TAMBACOUNDA	19 498	47 483	66 981	70,9	TAMBACOUNDA	7	11	10
KAOLACK	32 757	58 131	90 888	64	KAOLACK	8	11	10
THIES	89 486	96 602	186 088	51,9	THIES	8	10	9
LOUGA	20 854	72 031	92 885	77,5	LOUGA	8	9	9
FATICK	11 847	57 568	69 415	82,9	FATICK	8	10	10
KOLDA	16 780	51 097	67 877	75,3	KOLDA	7	10	9
MATAM	9 098	42 686	51 784	82,4	MATAM	10	10	10
KAFFRINE	7 891	43 917	51 808	84,8	KAFFRINE	9	10	10
KEDOUGOU	5 688	12 664	18 352	69	KEDOUGOU	7	8	8
SEDHIOU	6 905	32 319	39 224	82,4	SEDHIOU	10	11	11
SENEGAL	771 465	755 559	1 527 024	49,5				



# POTENTIALS BENEFICIAIRES

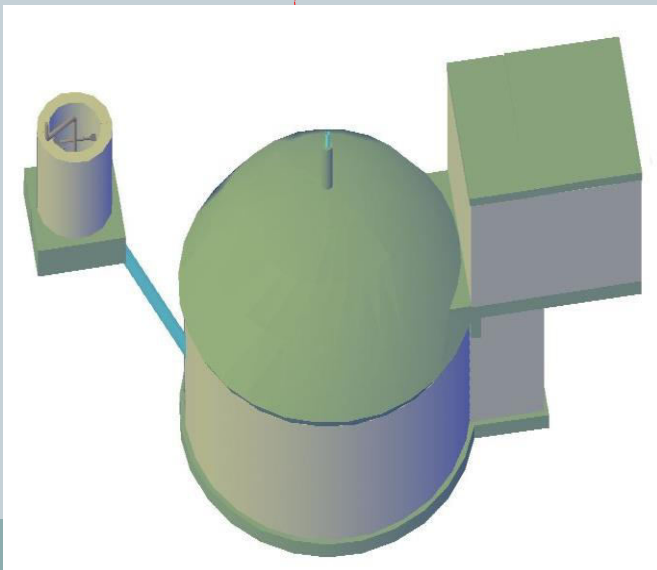
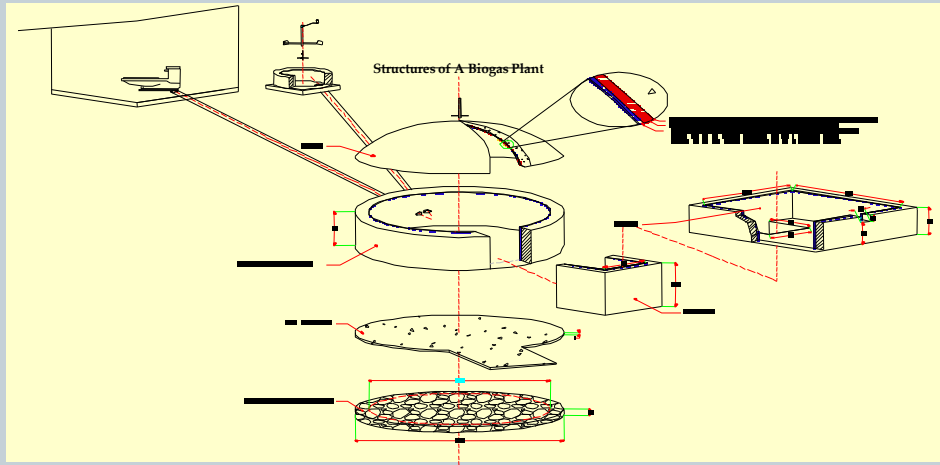
MAIN TARGET: HOUSEHOLDS PRACTICING LIVESTOCK



=> **453 000 HOUSEHOLDS** (SOURCE RPGHAE 2013)

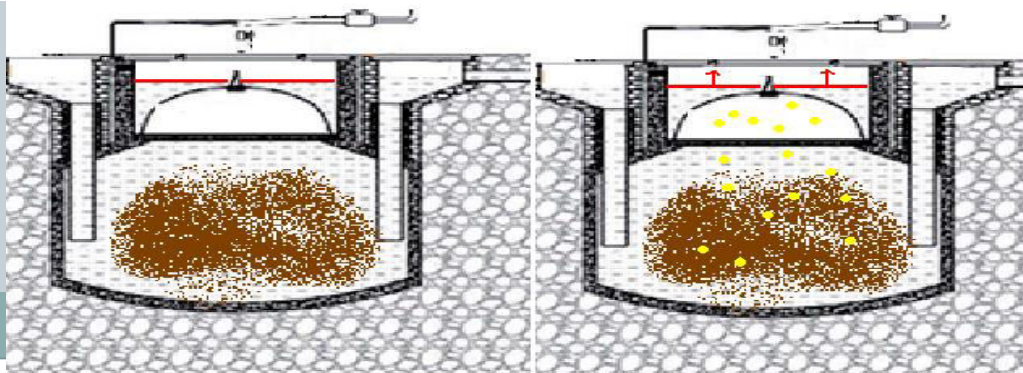
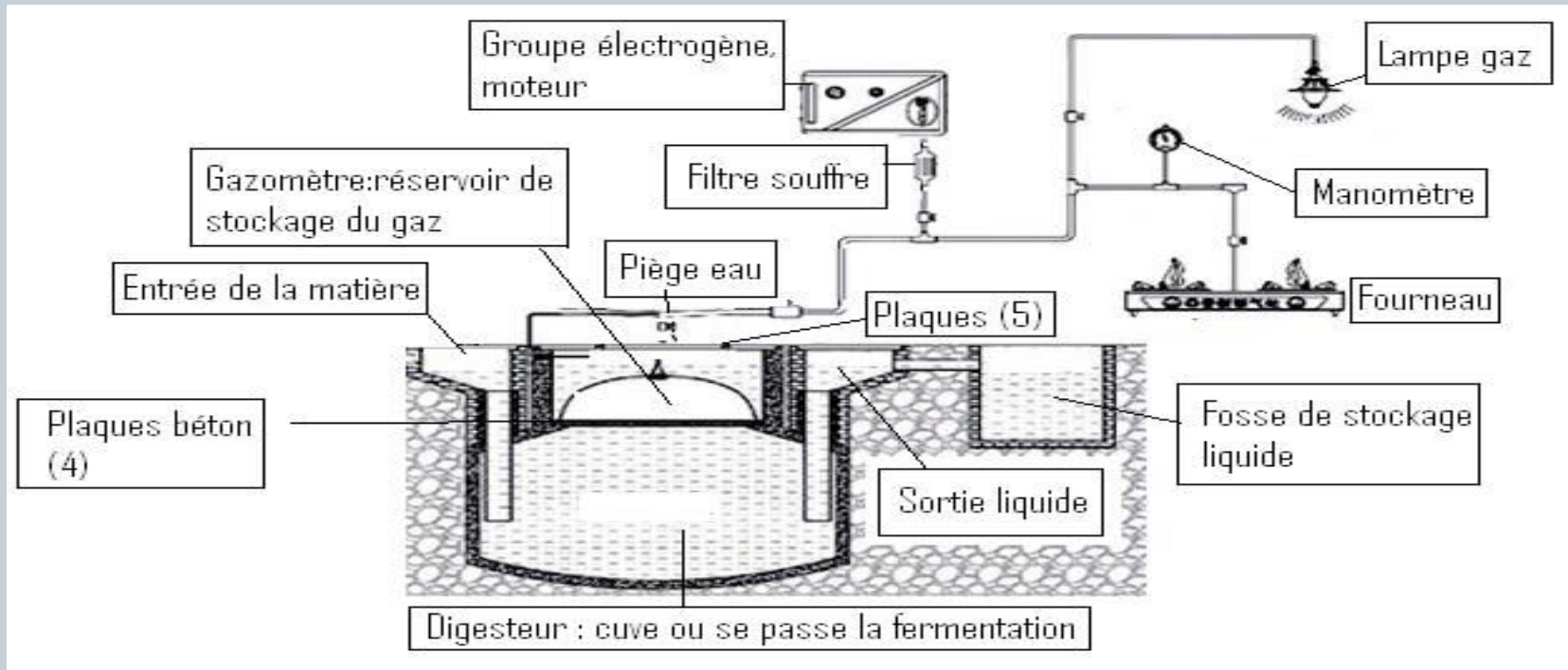
# IMPLEMENTATION STRATEGY

## USED MODEL: MODIFIED FIXED DOME CGC2047



# IMPLEMENTATION STRATEGY

## USED MODEL: PUXIN



# IMPLEMENTATION STRATEGY

## WHY THESE 2 MODELS???

- Easy to construct (approved models from China)
- No space consuming (under the ground)
- Friendly use / environment friendly
- Low maintenance and long lifetime (25-30 yrs)
- User needs oriented

Size of the biodigester (m <sup>3</sup> )	Initial feeding (kg)	Daily feeding (kg)	Water quantity (litre)	Use of the burner (in hours)	Use of the lamp (in hours)
8	3.000	60-80	60-80	6 to 8	15 to 20
10	3.800	80-100	80-100	8 to 10	20 to 25



République du Sénégal  
 Ou Poulx - Yul Dax - Uloo Poo  
 Ministère de l'Énergie  
 et du Développement des Énergies Renouvelables  
 Direction des Hydrocarbures



UNION EUROPEENNE

## Programme National de Biogaz domestique du Sénégal (PNB-SN)

### BIODIGESTEUR

#### IMPACT DU BIODIGESTEUR SUR LE MENAGE



*Le biogaz, une énergie  
naturelle et renouvelable  
pour un Sénégal émergent*



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## Le « biogaz » une filière transversale

Secteur : Elevage

Secteur de la  
construction et des  
infrastructures

Intrant « bouse  
de vache »

Equipement  
Biodigesteur

Produit : Biogaz  
domestique

Secteurs  
d'utilisation

- La cuisson
- L'éclairage

Production d'engrais organique

Secteur d'utilisation : Agricole

Développement des activités génératrices de revenus

# FINANCING THE PROGRAMME



- **FUNDING THE ENERGY COMPONENT BY**
  1. GOVERNMENT OF SENEGAL: **1 679 574 619 FCFA (2.560.500 EUR)**
  2. EUROPEAN UNION : **4 850 624 907 FCFA (7.394.730 EUR)**  
(Energy Facility)
  
- **FUNDING OF THE AGRICULTURE AND LIVESTOCK COMPONENTS THROUGH PARTNERSHIPS WITH :**  
**HEIFER, PASA-LOUMAKAF, PROGRAMME PLATEFORME, SODEFITEX, AVSF, etc.**

# FINANCIAL SUPPORT TO HOUSEHOLDS



SIZE OF THE BIODIGESTER	SUBVENTION RATE OF THE PROGRAMME	BIODIGESTER COSTS	AMOUNT OF SUBVENTION	HOUSEHOLD CONTRIBUTION IN KIND
<b>10 m3</b>	<b>80%</b>	<b>512 000 FCFA</b>	<b>410 000 FCFA</b>	<b>102 000 FCFA</b>
		<b>780,539 EUR</b>	<b>625,041 EUR</b>	<b>155,498 EUR</b>



# KEY ACTORS : OPERATING PARTNERS

## Example: Heifer Sénégal - PNB-SN

- **Targeted Area :**

- region of Thiès
- Niayes zone of the regions of Louga et Saint Louis

- **Co-funding**

- PNB-SN: 620 728 000 FCFA / 946.294 EUR
- HEIFER: 494 661 000 FCFA / 754.106 EUR
- Beneficiaries: Households, canteens : 182 546 250 FCFA / 278.290

- ⑩ **Expected results**

- 1.250 biodigesters are built and are in operation

# KEY ACTORS : SMALL ENTERPRISES AND OTHERS



**At least :**

- **40 Enterprises for the Construction of Biodigesters (ECB)**
- **05 local producers of lamps and gas burner**
- **104 skilled macons for the contruction works**



# KEY ACTORS : OTHERS PARTNERS



- Ministeries (livestock, agriculture, environnement, gender, water, etc)
- Local Collectivities
- Projects/programmes
- Universities, Research instituts, etc.

# Examples of achievements : Slaughterhouses in Saint Louis

Bio écO



**10 households in the neighborhood are connected to the system and they use the produced biogas for cooking purposes**

# Examples of achievements : Village in Fatick



## Achievements :



Up to date **1.085 biodigesters** have been installed

So you can imagine the **huge work** we still have to carry out!!!



*THANK YOU FOR YOUR KIND  
ATTENTION!!!!*



If you still have questions, please contact me at: [vieuxfall@yahoo.com](mailto:vieuxfall@yahoo.com)





AMBASSADE DE FRANCE  
AU SÉNÉGAL  
SCAC



Western Africa Biowastes for Energy and Fertilizer

