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Experimental contribution in the waste transforming system and its applications in thermal machines

"Clean and Ecological Sub-Saharan Africa(DRC) in the horizon 2030, 2064"

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Introduction

Our Central question

-Which does stop the pollution from waste and to restore the ecosystem in Sub Saharan Africa?

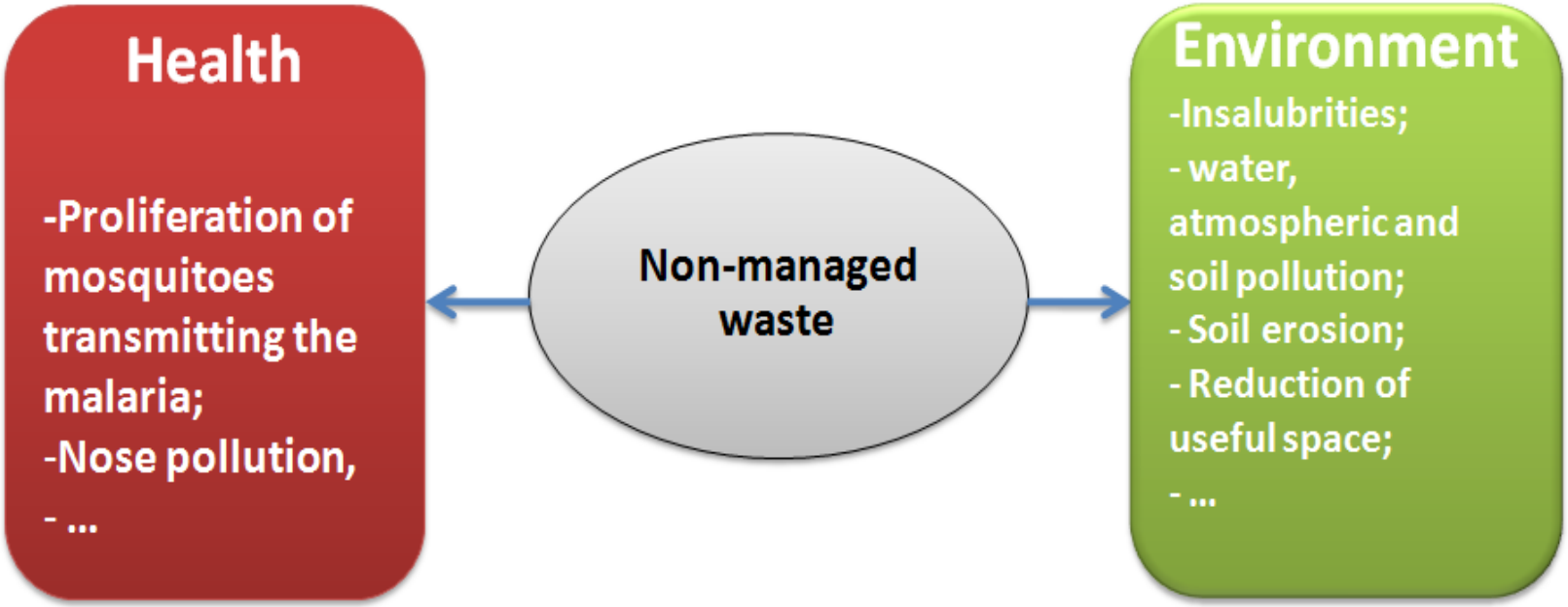
-What the appropriated African process can us adopt?

-What strategies can we choose and predict for Africa clean in 2025, 2030 to 2064 ?

Motivation

The waste is defined as any substance or object which is required to discard, it potentially represents an enormous loss of resources in the form of both materials and energy. In addition, the management and disposal of waste by its transformation can have positive environmental impacts in Sub-Saharan Africa(DRC) on the socio-economic and energy stability .

Non-managed waste effects



Global objective

To boost the economic by valorization the waste and its recycling process to restore our ecosystem

-To reduce the environmental and health negative impacts of waste and to improve the Sub-saharan Africa resource efficiency (green energy);

-. To vulgarize the waste management practice in the African society;

-. To predict a clean and ecological Sub-saharan Africa in the horizon 2025, 2030 and 2064.

Specific objectives

- To lead the Sub-saharan Africa country people to valorize their agro-pastoral residues potential energy in the environmental norms;

- To valorize the waste by producing the gas "CH4" to promote a better cleaning up of the environment;

- To reduce their energy dependence in the domestic, try to use less charcoal and produce many gas stove

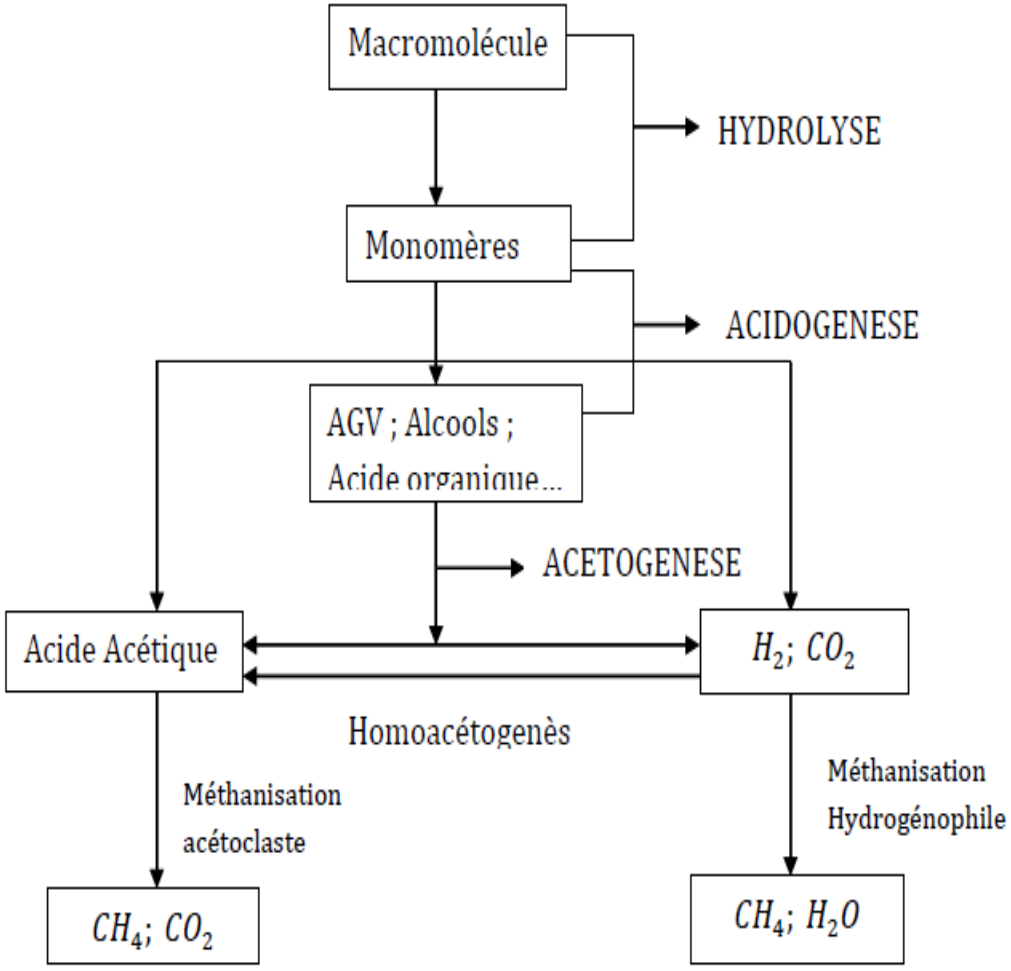
Waste African data

waste management in Africa has important consequences for the disposal of uncollected waste in dumps

Waste management is often one of the most complex public services, even when it organized properly

waste management is required in order to enable to reduce the overall amount of waste generated and to recover valuable materials for recycling and for the generation of energy.

Waste Transforming System's Experimental Model



The four phases of anaerobic digestion

-The transforming system based on the anaerobic digestion,

-The processes permitting to cultivate and to control the micro-organisms;

-Production methanol composed natural gas CH4 and 10 – 40% of carbonic gas CO2 and others.

"Yakam Matrix" in the liquefaction process

$$\Im_7 = \begin{bmatrix} I_{ss} I_{sl} & I_{sg} & I_{sp} & \cdots & I_{sc} \\ & \vdots & & \ddots & \vdots \\ I_{cs} I_{cl} & I_{cg} & I_{cp} & \cdots & I_{cc} \end{bmatrix} \qquad C_m^n = \frac{m!}{n!(m-n)!} \quad (1)$$

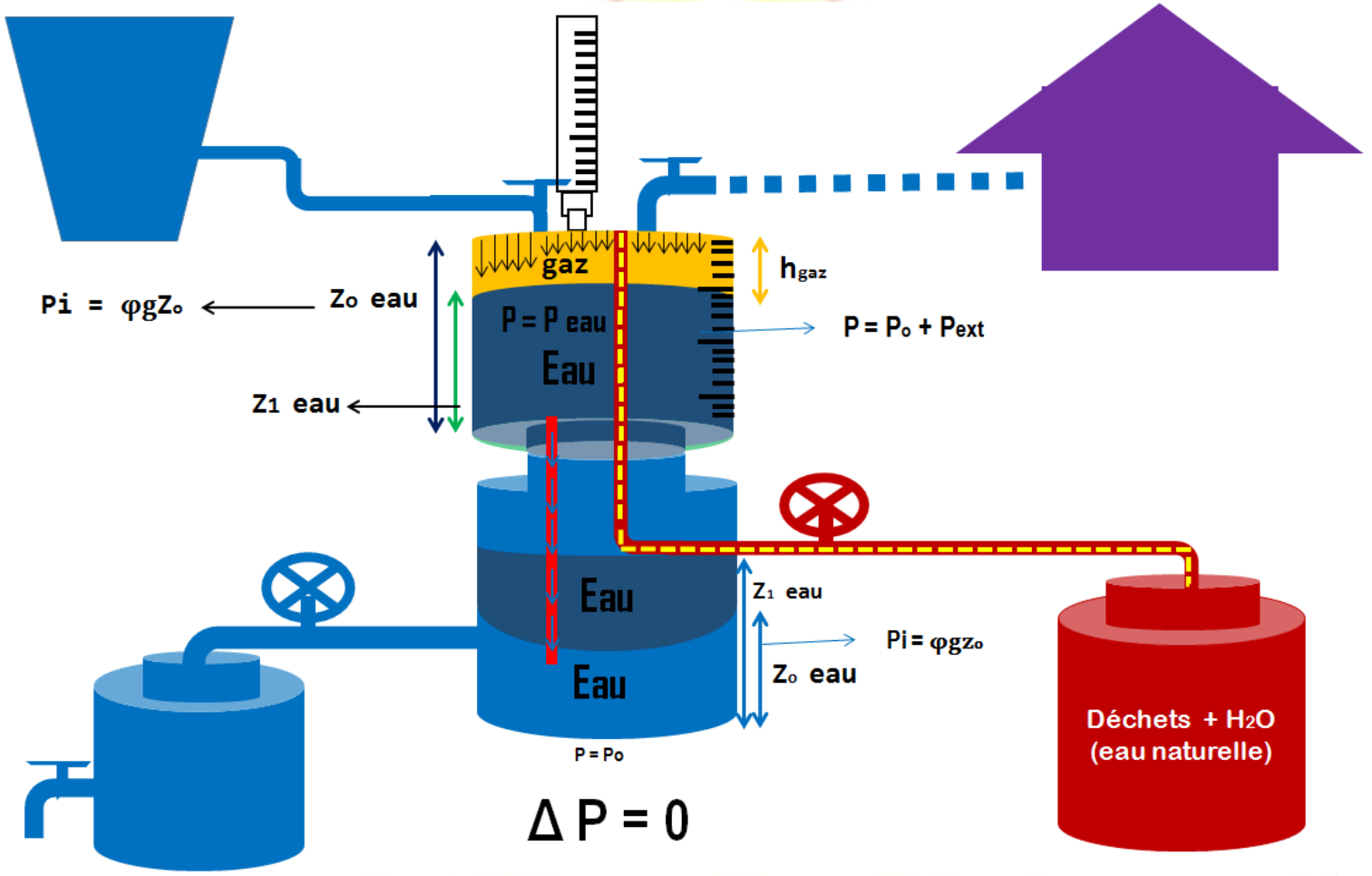
Physical states n well known:

solid (s), liquid (l), gas (g), plasma (p) etc., and

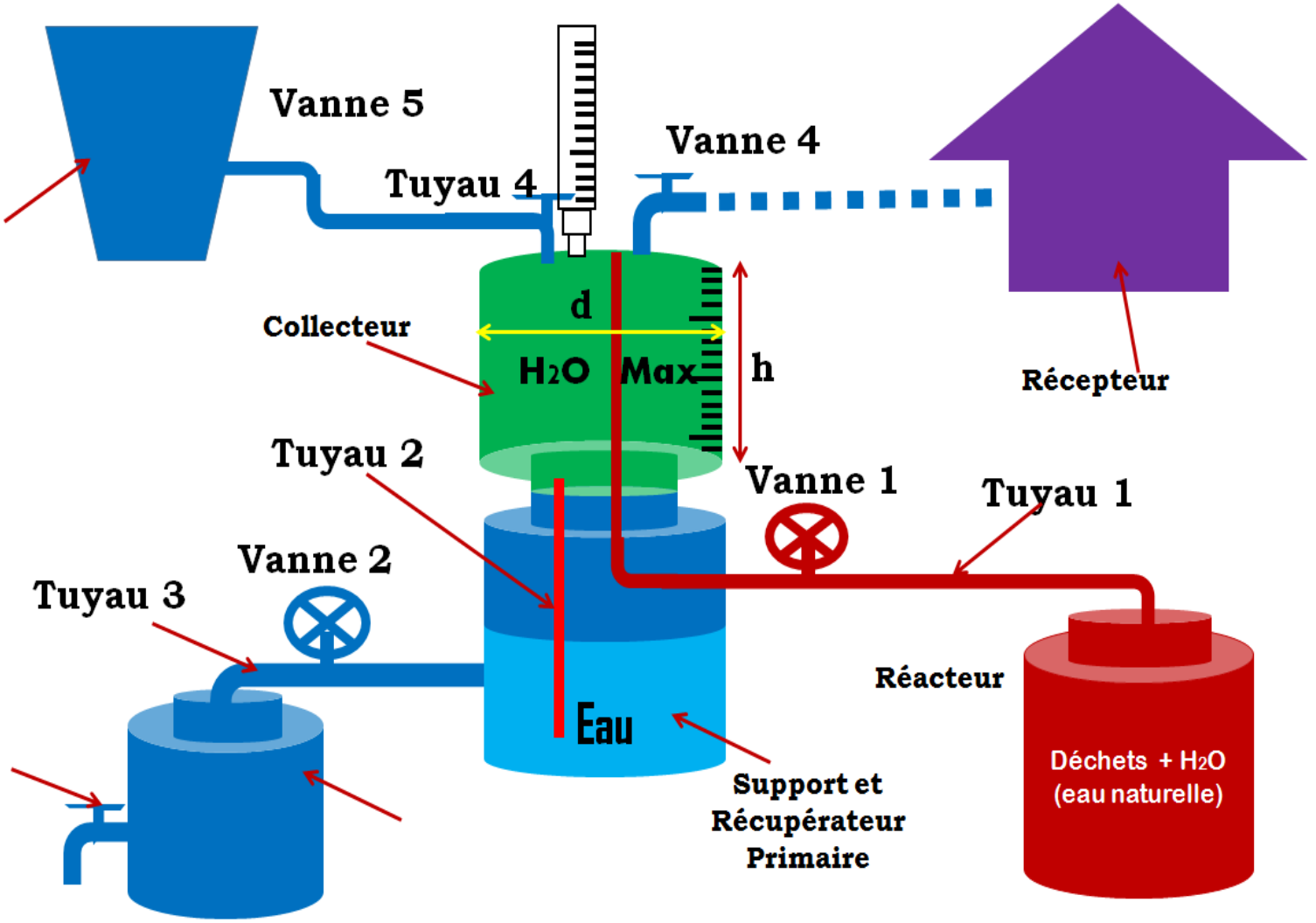
colloidal (c).

Different interfaces I of two physicals states or three states

Physical model approach



Industrial model approach



Predictive Simulation in 2025,2030,2064

If every African can use a gas stove for cooking and stopped to use charcoal: -shortly"2025" the waste it can become a current asset or raw material for all and our forest it gonna be totally protected

If each country can apply the training program on waste management from Primary to secondary school; by 2064 each African can be an actor of effective waste management and Africa supposed to be totally clean

Applications &Discussion

Fig.5: production du biogaz en fonction du volume du réacteur

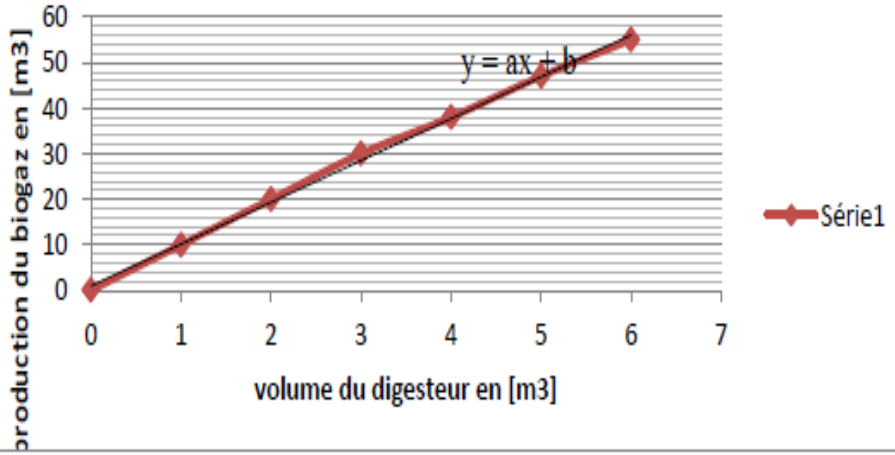


Fig.1:L'evolution de la temérature en fonction du temps

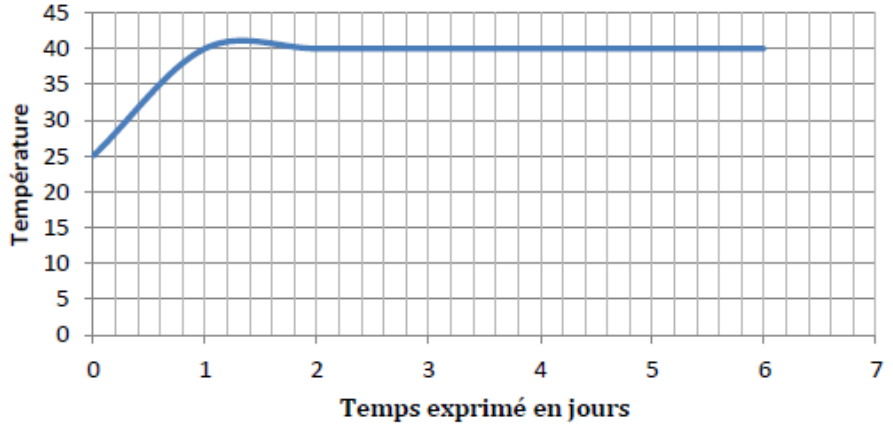


Fig.2: la variation de la température de 3°C

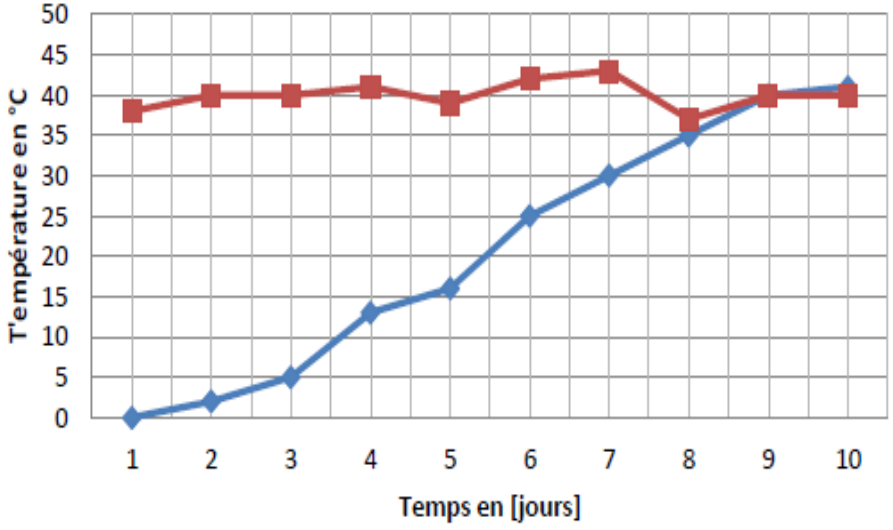


Fig.3:production du biogaz en fonction de jours

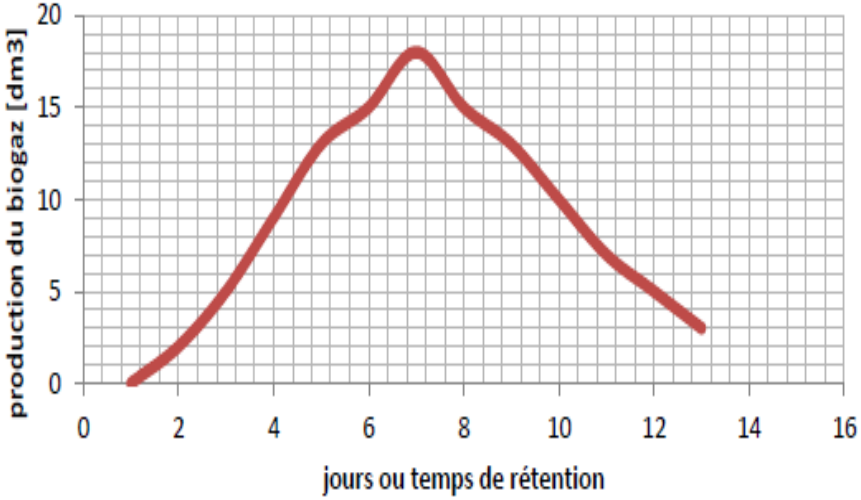
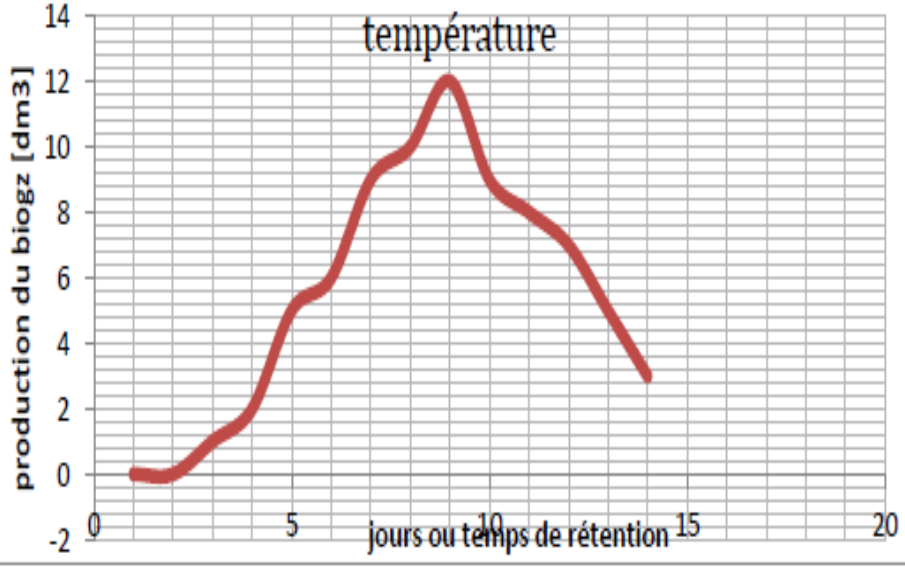


Fig.4: production du biogaz avec basse température



Recommendations

1.- Optimal System of waste recycling

2.- Training program on effective waste management (From Primary to High Education)

3.- Valorization by waste transformation to natural gas "CH4"and its employability in thermal machines(gas stove)

4.- Promotion of small useful machines design using natural gas "gas stove..."

5. - Reforestation

THANKS A LOT

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for Africa Development