FODDER YEAST FROM BIOETHANOL DISTILLERY SLOPS. AN ENVIRONMENTAL SOLUTION

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Focus Themes:
Technology and value addition

To which sector/s of agribusiness does the solution apply?:
Other

logistics:
Cold Chain

Please name:
ENVIRONMENTAL PROTECTION/ REUTILIZATION AND UPGRADING OF WASTEWATERS

Please describe the solution /project. :
The solution use a highly pollutant wastewaters (> 30 kg/m3 BOD) and propagates fodder yeast Candida utilis with more than 47.5% Kjeldahl protein, reducing at the same time more than 70% of the organic load –responsible for pollution. 3.36 Kg of CO2 are retired for emission per each ton of yeast produced

What problem or market opportunity did it address?:
Feedstuffs are scarce and expensive present day. Moreover they depends normally of climate. Fodder yeast is independent of climate and requires less land extension. Im addition it upgrades an higly pollutant wastewaters

How was the solution developed?:
Solution was developed through a research project started in the early 90's and finished with the first industrial installation in 1999

What were the implementing stages of the solution?:
Implementation needs: feasibility study, basic engineering, executive projects, erection, tests, training of personnel and put into operation

What challenges had to be overcome?:
There is no relevant challenges to overcome

What are the main outputs / outcomes of the solution?:
Main outputs are: wastewaters ready for irrigation (less than 10 kg/m3 of BOD) and feeding protein. If the project is conceived with swine fattening, meat could be an output as well

What are the lessons learned in implementing the solution? What factors were critical for its success?:
High yeast concentration in propagation broth are not possible. No critical factors have been found during industrial operation, however an stable supply of distillery slops is essential

If there are other solutions to a similar problem what makes this one different?:
There is no similar solutions that produce protein and reduce contamination at the same time. It is an unique
solution to present day problem: decontamination of wastewaters from an alternative source of energy for fossil fuels

**How long was the duration of the project / how long was required for the solution?:**

Project cycle from lab scale to industrial implementation required about 10 years

**Which institutions / organizations are supporting the implementation of the solution? :**

Local / national government agencies

**What are the key areas of impact?:**

*Social*

*Employment*

*Food security/availability*

*How is the impact evaluated?:*

It could be assessed in different ways: reduced local contamination; creation of new factory with an important offer of new jobs, production of feed protein for local animal production with its concomitant food availability from local resources

**What was/is the budget allocated to design/implement your solution?:**

4,000,000.00 USD

**How was the solution financed?:**

Local/national government

**Were alternative sources of finance considered?:**

Yes

**Please Specify:**

Carbon credits could be an important source of funding

**How can the sustainability of the solution be ensured?:**

Sustainability is ensured by project philosophy: slop treatment close the cycle of fuel bioethanol production. Wastewaters from yeast production can be irrigated with no harm to soil or plants. Financial sustainability would be achieved by credit carbons due to emission reduction.

**Is there a cost recovery scheme in place?:**

A techno-economical study is available. However it will depend on local conditions and prices. Investment is recovered in less than three years depending on production scale

**Are beneficiaries able / willing to pay for services?:**

Such an analysis must be casuistic

**What are the future plans for the implementing institution?:**

Interests in this technology have been received from: Venezuela, Mexico, Colombia, South Africa, Soth Korea and Brazil. Projects are under development for the first two

**How will the implementing institution continue to provide services to beneficiaries?:**
Consultancy and technical assistance for troubleshooting is guaranteed during installation life span. Scale down experiences can be carried out if needed.

**Are there expansion plans for new services – new potential beneficiaries?:**

Technology could be extended for other biodegradable wastewaters, i.e. cheese whey.

**Can the solution be replicated/scaled up to cover other areas/regions/countries/groups/products? :**

It certainly can be replicated. Technology modification can be done as well to meet customer needs.

**In which way can this be achieved and what resources would be needed in order to replicate/scale up the solution? :**

The only need is financial and the nearby production of bioethanol from cane, sweet sorghum or any other source of sugar that produce liquid wastes, namely slops.

**What should be considered in the implementation?:**

Nothing special should be considered as far as local condition guarantee the minimum resources for production.

**Please Upload Documents:**

- SLOP YEAST SOLUTION1.pdf

**Does the solution model offer opportunities for South-South cooperation? :**

Yes

**Is there cooperation already ongoing with initiatives or projects in other places? :**

Yes

**What are the tools and elements needed for South-South cooperation?:**

Financial support for project implementation

**How could South-South cooperation be implemented? :**

By direct technology transfer and technical assistance during project implementation period and beyond that.

**Comments:**

Project documents and relevant information can be obtained through non-disclosure agreements signature.

**Reports, brochures, newspaper clippings etc. (PDF format preferred) :**

- ICIDCA_additional information.pdf

Youtube Videos: