Support to Mexico's M2M Agriculture Program

Promoting anaerobic digestion pig and dairy farms

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Workshop on Recovery and Use of Agricultural Waste Methane

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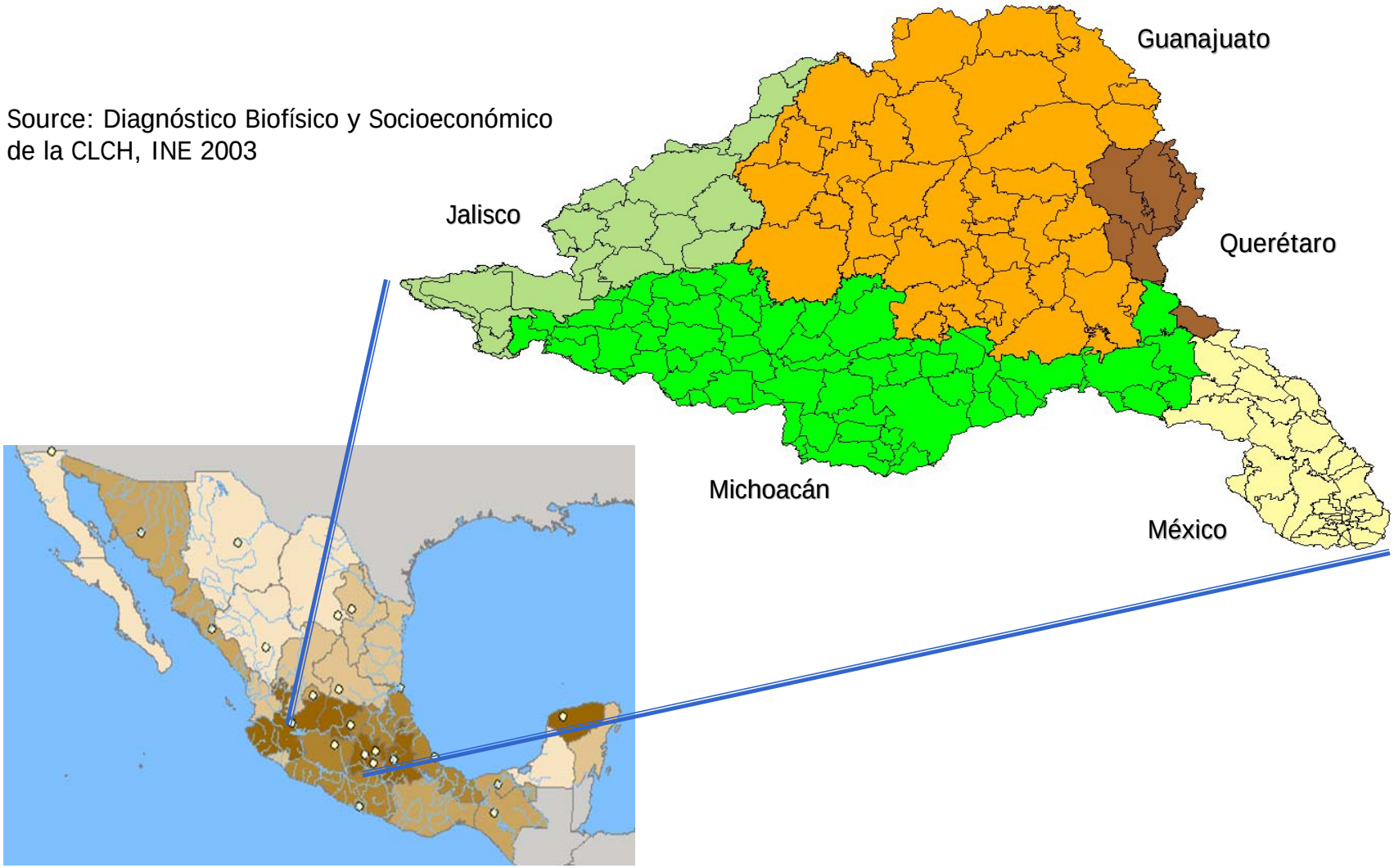
Program overview

Background

- Mexico is the 2nd largest swine producer in Latin America, and the 18th worldwide (>15 M pigs)
- Mexican swine production grew by 2.8% between 1999 and 2004
- Almost 70% of Mexico's swine production is located in 6 states: Jalisco, Sonora, Guanajuato, Puebla, Yucatan y Michoacán
- Period of performance: late 2005 to date
- M2M efforts focusing on swine farms in the Lerma-Chapala Watershed
  - High concentration of small and medium farms: 4.8 million of pigs (35 % of total national production)
  - Critical agricultural region: population of > 11 MM (2000) with accelerated expansion of agricultural limits
  - Significant environmental impacts: Eutrofication of water sources caused by hi-concentration of nutrients and a reduction of biodiversity due to high BOD

Lerma-Chapala Watershed

Source: Diagnóstico Biofísico y Socioeconómico de la CLCH, INE 2003



Program objectives and partners

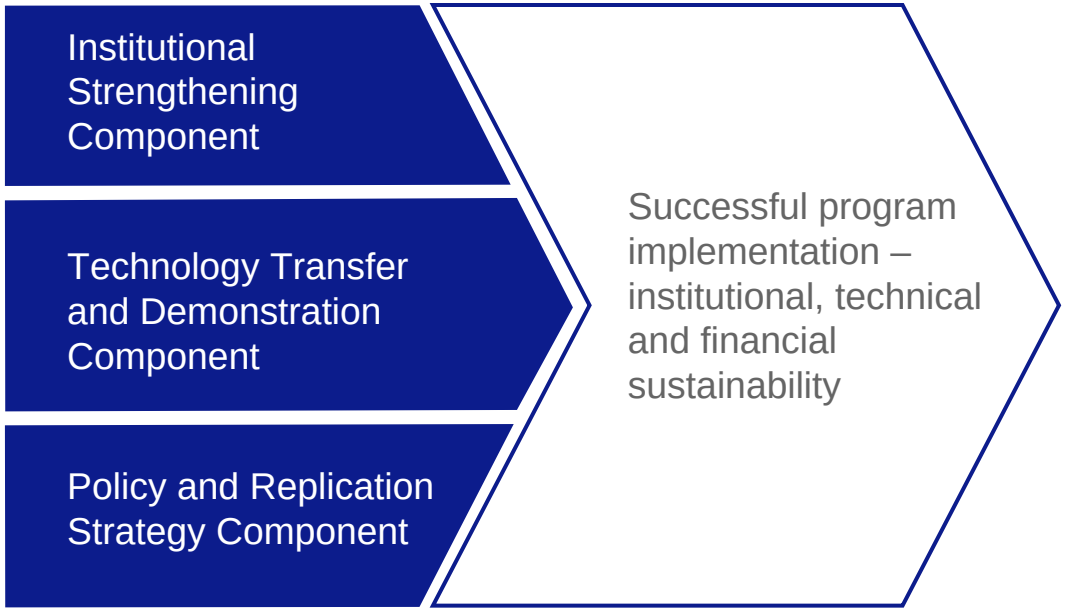
Objectives

- Reduce GHG emissions from anaerobic lagoons in swine farms; promote alternative fuels and bring economic savings to the farms
- Promote sound environmental management and reduce pollution to water bodies

Program Partners

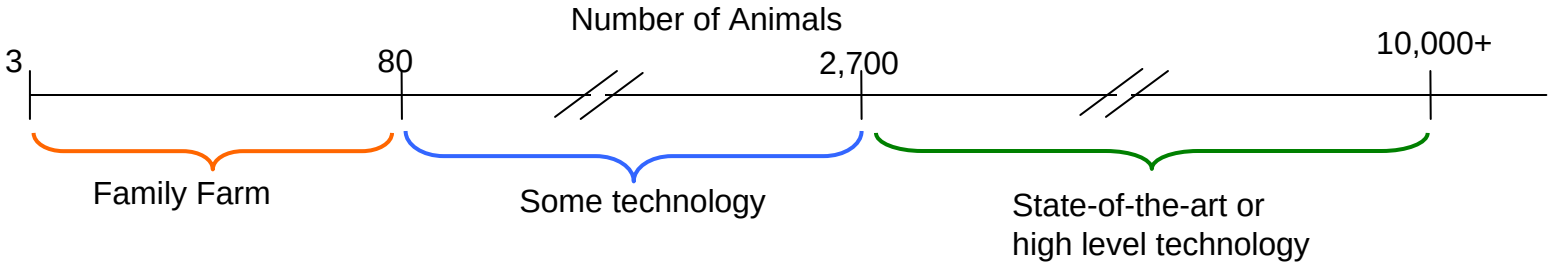
Program approach

- Designed to have a positive impact on:
  - environment, through an integrated waste management approach
  - rural and economic development, through income generation and/or farm operating cost-reduction activities
- Designed to test US and local technology through:
  - pilot projects in representative farms
  - technology and know-how transfer from the US



Institutional strengthening component

- Livestock country profile (e.g., size, resources used, waste generation), methane generation potential. Characteristics of the market:
  - 40% from high level technology farms (700+ farms).
  - 10% of production from farms with some level of technology (2,200+ farms).
  - 50% of production from farms with a very low level of technology (90,000+ farms).



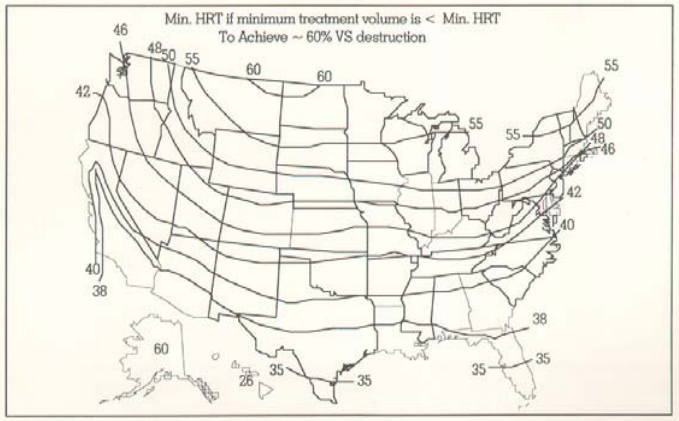
- Capacity building to SEMARNAT and SAGARPA staff through a series of short training sessions focusing on manure management, methane capture and flaring, and economic and environmental assessments of biodigesters.

Technology transfer and demonstration component

This component focuses on demonstration projects to show the benefits of different technologies applicable to the local context.

- Working with farms of all sizes - from small/medium size (~500 swine) to large integrator farms (>1,000 swine)
- M2M has applied the scientific and technical knowledge developed in the US to design anaerobic digestion systems and lagoon sizing protocols that are applicable to Mexico; the program adapted these standards to consider Mexican temperatures and farm-specific loading rates.

Figure 2: Covered Anaerobic Lagoon Minimum Hydraulic Retention Times (MINHRT in days)



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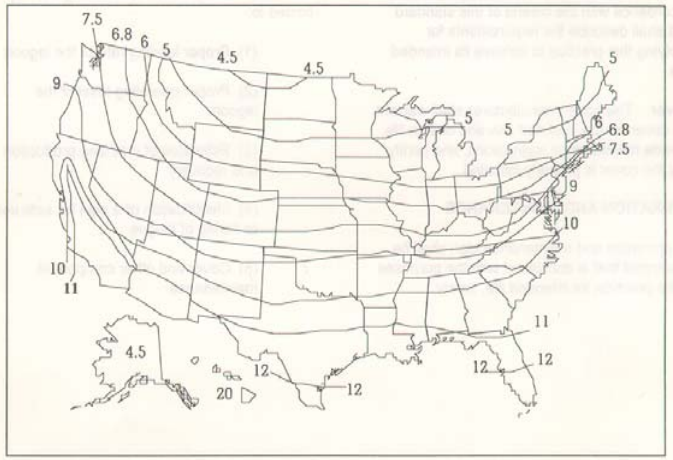
NRCS, NHCP
May, 1996

Figure 1: Covered Anaerobic Lagoon Maximum Loading Rate (lb VS/1000ft^3/day)



Technology transfer and demonstration component

- To date, five projects in swine farms demonstrating two different technologies applicable to Mexico - typical covered lagoon and modular covers – a new technology is under review (bag technology) for small/medium farms
- Developed local flare technology appropriate for small/medium size farms.
- Provided on-the-job technical training in lagoon sizing, construction and cover installation; promoted FarmWare as a useful preliminary design tool
- Started conducting monitoring of operational performance of the demonstration projects

Farm	Animal population	Biogas captured (m^3/day)	Emissions reduced (Ton CO_2/year)
GCM	7,500	NA	NA
Santa Mónica	6,000	450	1,400
Pegui	460	25	70
Guadalupe	142	9	25
Paraiso IV	120	12	33

Demonstration projects - Granja Pegui

Before

After

Demonstration projects - Granja Santa Mónica

Before

After

Demonstration projects - Granjas Carroll de Mexico

Before

Policy and replication strategy component

This component is focused on promotion and awareness activities by the major stakeholders (i.e., SEMARNAT, SAGARPA and CPM).

- Promotion and awareness activities to attract public and private investment through dissemination of information
- Establishment of formal collaborations with the swine sector, local technical institutions, and an official program at SEMARNAT to ensure the development of policies, technical standards and financing opportunities for anaerobic digestion projects as part of an integrated waste management strategy.
- Development of case studies and regional workshops to promote lessons learned and foster project development replication.

Implementation through the Mexican National Subcommittee for Agricultural Wastes.

Lessons learned

- Find a policy champion
- Involve key stakeholders
- Ensure policy is based on sound scientific and technical knowledge and experience
- Adapt to local conditions
- Integrate into overall country strategy

Next steps

- Continue to support SEMARNAT in the leadership of the M2M program in Mexico
  - Institutional strengthening
  - Technology transfer and demonstration
  - Policy and replication strategy.