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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Thirty-eighth Meeting
Rome, 20-22 November 2002

PROJECT PROPOSAL: GUATEMALA

This document consists of the comments and recommendation of the Fund Secretariat on the following project proposal:

Fumigant

- National phase out of methyl bromide

UNIDO

**PROJECT EVALUATION SHEET
GUATEMALA**

SECTOR: Fumigant ODS use in sector (2001): 796.6 ODP tonnes

Sub-sector cost-effectiveness thresholds: n/a

Project Titles:

(a) National phase out of methyl bromide

Project Data	Methyl bromide
Enterprise consumption (ODP tonnes)	796.60
Project impact (ODP tonnes)	473.40
Project duration (months)	72
Initial amount requested (US \$)	4,824,340
Final project cost (US \$):	
Incremental capital cost (a)	6,272,488
Contingency cost (b)	627,249
Incremental operating cost (c)	1,217,949
Total project cost (a+b+c)	8,117,686
Local ownership (%)	100%
Export component (%)	0%
Amount requested (US \$)	4,824,340
Cost effectiveness (US \$/kg.)	
Counterpart funding confirmed?	
National coordinating agency	Ministry of the Environment and Tourism
Implementing agency	UNIDO

Secretariat's Recommendations	
Amount recommended (US \$)	
Project impact (ODP tonnes)	
Cost effectiveness (US \$/kg)	
Implementing agency support cost (US \$)	
Total cost to Multilateral Fund (US \$)	

PROJECT DESCRIPTION

1. The project is to phase out 473.4 ODP tonnes of methyl bromide (MB) used for soil fumigation in melon, tomato, strawberry and cut flowers crops in Guatemala, representing 60 per cent of the total MB consumption in the country. Implementation of the project will achieve the 20 per cent reduction in MB baseline consumption by 2005.
2. The total surface area where melons are produced and MB is applied is 4,665 ha. Of this area, 1,208 ha are owned by non-Article 5 companies, with a total MB consumption of 217.4 ODP tonnes of MB.
3. The selected alternatives are grafting (melons), metam sodium in combination with solarisation (tomatoes) and steam pasteurisation of the substrate (cut flowers and strawberries). A demonstration project on alternatives to the use of MB in soil fumigation was approved by the Executive Committee at its 22nd Meeting at a total cost of US \$440,000 (UNIDO).
4. The results of the demonstration project were very positive in broccoli and tomato crops, using bio-fumigation and solarisation in combination with metam sodium. Since then, the use of MB for soil fumigation of broccoli and cabbage has been replaced by bio-fumigation. This same technology has also been used in tomato crops, limiting the use of MB for particularly infested areas. In melons, the use of alternative chemicals (metam sodium and telone C-35) in combination with solarisation were effective against most of the common diseases, but inefficient against melon necrotic spot virus. For this reason, in the demonstration project, the use of grafted plants was tested with very positive results (this technology is considered the best available solution to the existing melon pests in tropical/ sub-tropical areas, as well as in moderate climates).
5. Grafting is an effective method to control soil borne diseases, nematodes, virus (necrotic spot viruses transmitted by a soil fungus). This technology requires the installation of greenhouses and an acclimatised workshop for grafting, a sowing machine, a germination room, and trays, at an estimated cost of US \$5.25 million. The application of metam sodium in combination with solarisation requires modification to the irrigation system (US \$319,000). The use of steam pasteurisation in cut flowers and strawberry crops requires 24 boilers of different capacities, a pasteurisation kit (PVC sheets with steam inlets) and a pasteurisation tunnel at a cost of US \$816,200. The project also includes a training programme (US \$515,570). Incremental operating costs amount to US \$1.22 million.
6. The Government of Guatemala is committed to a permanent reduction in aggregate consumption of controlled uses of MB, banning its use in soil fumigation and any other non-critical uses. The Government is also committed to a complete phase-out in the use of MB by 2008, through the implementation of the project.
7. The project will be implemented by UNIDO under the co-ordination of the Ozone Office and the Ministry of Agriculture.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

Non-Article 5 ownership

8. The total surface area fumigated with MB in the production of melons is 4,665 ha. Two of the companies involved in the production of melons have a non-Article 5 ownership component (about 26 per cent of the total cultivated surface area). The project cost was discounted taking into account the foreign ownership component.

MB consumption

9. The project proposal indicated that agricultural production in Guatemala decreased by 50 per cent in the years 2000 and 2001 due to adverse climatic conditions, including Hurricane Mitch. However, MB consumption increased by 53 per cent between 1999 and 2001. The Secretariat sought an explanation for the large increase in MB consumption when agricultural production substantially decreased. UNIDO informed the Secretariat that the protected agriculture production where MB is applied represents a very small portion of the total agricultural production in the country (i.e., cereals, sugar cane, fruits, tubers) where MB is not applied in the soil.

Strawberry crops

10. The Secretariat pointed out that MB consumption in strawberry crops is very small (0.6 ODP tonnes) and limited to only one production co-operative, and requested additional information on how other growers are producing without the use of MB. The Secretariat also questioned the long-term sustainability and cost-effectiveness of the steam pasteurisation technology, taking into consideration the small amount of MB used, the low-price of strawberries, and the high operating and maintenance costs associated with the use of a boiler (fuel, water, very long period of time required). UNIDO informed the Secretariat that MB is only applied for fumigation of nursery substrate to ensure the production of healthy seedlings. The production co-operative is the only one with a nursery for seedling production and supplies many other growers. Also growers are not using MB for open-field soil fumigation, which is one of the reasons why the yields are low. The cost of importing and transporting substrates (to avoid fumigation) would be very high; and the use of the chemical telone C-35 as an alternative to steam was not considered since this fumigant is not registered in Guatemala.

Tomato crop

11. The Secretariat and UNIDO discussed cost issues related to the modification of the irrigation system, including the venturi injector, water tanks, and plastic sheets (the unitary cost of the equipment proposed at US \$3,220/ha excluding piping was very high compared to equipment in similar projects that have been approved). Furthermore, since farms in Guatemala are smaller than in other Article 5 countries, then, the cost per ha is higher. However, it is feasible to use smaller buffer tanks at a lower cost. Regarding the price of the plastic for

solarisation, UNIDO indicated the plastic film produced in Guatemala does not have the necessary anti-ultraviolet additives and disintegrates very quickly. Therefore, the price of plastic is based on solarisation-quality imported plastic, which is not available in Guatemala.

12. The Secretariat pointed out that the annual operating cost for replacing MB with metam sodium (at US \$287.50/farmer with a surface area of 0.5 ha) was very high, and sought a clarification on whether this issue was carefully discussed with small farmers during project preparation. UNIDO informed the Secretariat that this issue had been discussed with farmers and with the Ministry of Agriculture and it was agreed to use this technology.

Cut flowers

13. The project proposes the phase out of 17.6 ODP tonnes of MB used in the production of cut flowers by steam pasteurisation at a total cost of US \$1,480,000 (including capital cost, operating costs and training). The Secretariat pointed out that the cost effectiveness of this project component appeared not to be sustainable. UNIDO indicated that growers in Guatemala are currently using very low amounts of MB for fumigating the substrate (and not the open field) which is produced from their own agricultural wastes (if instead of substrate, growers would have used MB treated soil, the consumption of MB would have been 125 ODP tonnes). The selection of this alternative was decided after examining all possible alternatives by growers, Government technical staff and UNIDO. The growers are fully aware of the incremental operating costs of this alternative; however, on the basis of the results achieved through the demonstration project, farmers decided to select this alternative.

Melons (grafting)

14. The Secretariat indicated that in the off-season, the proposed greenhouses could be used for production of other crops. UNIDO informed the Secretariat that taking into account the relatively small area of the proposed greenhouses, the production of other crops would not be economically viable.

15. The Secretariat and UNIDO are finalising discussions on the project cost. The results of the discussions will be communicated to the Sub-Committee on Project Review.

RECOMMENDATION

16. Pending.
