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EXECUTIVE COMMITTEE OF  
THE MULTILATERAL FUND FOR THE  
IMPLEMENTATION OF THE MONTREAL PROTOCOL  
Forty-third Meeting  
Geneva, 5-9 July 2004

**PROJECT PROPOSAL: LEBANON**

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

Fumigant

- Phase-out of methyl bromide for soil fumigation in strawberry production (request for change of technology)

UNIDO

## **PROJECT DESCRIPTION**

### Introduction

1. At the 34<sup>th</sup> Meeting of the Executive Committee, the Government of Lebanon submitted two project proposals for the phase-out of methyl bromide (MB) in Lebanon:

- (a) Phase-out of 186.1 ODP tonnes of MB used in vegetable, cut flower and tobacco production, at a total cost of US \$2,600,000, to be implemented through UNDP; and
- (b) Phase-out of 50.4 ODP tonnes of MB used for soil fumigation in strawberry production, at a total cost of US \$1,821,945, to be implemented through UNIDO.

2. Subsequently, the Executive Committee decided to:

- (a) Approve in principle US \$4,421,945 as the total funds that would be available to the Government of Lebanon to achieve the complete phase-out of MB in Lebanon,
- (b) Approve the agreement between the Government of Lebanon and the Executive Committee contained the agreed conditions for the phase of MB in Lebanon;
- (c) Approve the first tranche of the two projects, i.e., US \$800,000 for UNDP's project and US \$350,000 for UNIDO's project (Decision 34/56).

3. Since the approval of the agreement, the Executive Committee has agreed to the disbursement of three tranches of the two projects and has allocated US \$1,900,000 to UNDP (for a total phase-out of 111.6 ODP tonnes MB) and US \$1,221,946 to UNIDO (for a total phase-out of 30.3 ODP tonnes ). The third tranche of each of the two projects was approved at the 41<sup>st</sup> Meeting (UNEP/OzL.Pro/ExCom/41/41). The total amount of MB that has been phased out through implementation of the two projects is consistent with the total amount agreed by the Government of Lebanon.

4. On behalf of the Government of Lebanon, UNIDO has submitted to the 43<sup>rd</sup> Meeting of the Executive Committee, a report with a request for the change of the technology in the project for the phase-out of MB for soil fumigation in strawberry production. The report submitted by UNIDO is summarized below.

### Issues encountered during project implementation

5. The alternative technology selected for the phase-out of MB used for soil fumigation in strawberry production was the negative pressure soil steaming technology in combination with an integrated pest management (IPM) programme. Implementation of the steam technology requires installation of pipes in the soil, an electric fan, and the use of 9 steam generators.

6. As it was reported to the Executive Committee at its 38<sup>th</sup> and 41<sup>st</sup> Meeting, in 2002 and 2003 respectively, a total of 16.1 ODP tonnes of MB used in strawberry farms has been phased

out. However, this was achieved through the application of IPM principles (i.e., crop and land rotation, and reduced MB application rates), rather than the use of steam, which met some technical and cost limitations encountered during the implementation of steam technology (UNEP/OzL.Pro/ExCom/38/41 and 41/41).

7. According to the report now submitted by UNIDO to the 43<sup>rd</sup> Meeting, the limited amount of MB phase-out achieved through the application of steam was due to a delay in the delivery of steaming machines in 2002, technical limitations pertaining to steam application (i.e., limited access to the production fields; longer application time; lack of adequate quality water; water and fuel replenishment; machine breakdown and associated time delays). Also operating costs were much higher than previously estimated (i.e., high and constant increase in fuel prices; high labour costs and difficult payment facilities for farmers; and high rental costs of tractors to pull the steam machine). Under these circumstances, the soil steaming technology in Lebanon is not sustainable or economically viable. This has significantly reduced the acceptance of steam technology by the local strawberry farmers.

#### Proposed change in technology

8. UNIDO has advised that the Government of Lebanon wishes to redesign the project proposal to introduce the following alternative technologies: combination of reduced dose of alternative chemicals (metham sodium, 1,3-dichloropropene and chloropicrin) alone or with solarization, in combination with an IPM programme.

9. Based on the results from the demonstration project on alternatives to the use of MB for soil fumigation approved by the Executive Committee at its 26<sup>th</sup> Meeting (UNDP, US \$328,200), the technologies selected to replace MB in soil treatment are: solarization in combination with alternative chemicals (metam sodium, 1,3-dichloropropene) and bio-fumigation (for vegetables),

10. The project re-orientation has been proposed based on the field experience of the project team in the phase out of MB in Lebanon and on a careful analysis of the strawberry sector by both the project team and international experts. The proposed alternative technologies have already been demonstrated in Lebanon (through a demonstration project approved by the Executive Committee at its 26<sup>th</sup> Meeting) and are currently being used for the phase-out of MB in vegetables (UNDP's project). In addition, the proposed technologies have been tailored according to the pest pressure and cropping practices in each of the main strawberry production regions in Lebanon. Based on these considerations, UNIDO has now indicated that the selected technologies are practically and economically feasible and accepted by the farmers.

11. The Government of Lebanon has reiterated its commitment to proceed with the project and to achieve the complete phase-out of MB by 2006 consistent with the current Agreement.

12. The following distribution of the remaining balance of the project (i.e., US \$1,404,669) has been proposed:

<b>Description</b>	<b>Cost (US \$)</b>
Salaries	286,359
Alternative supplies (heat resistant plastic sheets, soil thermometers, soil moisture meters)	205,690
Training of trainers and farmers	45,000
Monitoring of alternatives; equipment for follow-up of soil born strawberry pathogens	236,000
Training of trainers and farmers in IPM programme	30,000
Contribution to production of healthy transplants	195,000
Contribution to management of crop wastes	25,000
Booklets, brochures, stickers, logo, CDs, TV spots, video production, web development	80,000
Participation at international conferences and purchase of relevant publications	35,000
Field vehicle, laptops, LCD projector, projection screens, cameras	90,000
Petty cash and unforeseen expenditures	181,620
<b>Total cost</b>	<b>1,404,669</b>

## **SECRETARIAT'S COMMENTS AND RECOMMENDATION**

### **COMMENTS**

13. The Secretariat reviewed the project documents in light of the original project proposal approved at the 34<sup>th</sup> Meeting of the Executive Committee. These included: the annual requests for the second and third funding tranches of the project; the various exchanges of correspondence between the Secretariat and UNIDO; other MB investment projects approved by the Executive Committee; and relevant decisions taken by the Executive Committee.

#### Decision on change of technology

14. At its 22<sup>nd</sup> Meeting, the Executive Committee adopted guidelines for change of technology for projects already approved (Decision 22/69)<sup>1</sup>. Notwithstanding the terms of Decision 22/69, the Agreement between the Government of Lebanon and the Executive Committee covering this project and the project under implementation by UNDP, provides for flexibility by the Government in implementing the project components which it deems to be more important in order to meet its phase-out commitment.

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<sup>1</sup> According to the guidelines, there is a presumption that the technology selected in all projects will be mature and that the projects will be implemented as approved. Specifically, for projects approved after the adoption of these guidelines (i.e., the MB phase-out project for Lebanon), the Executive Committee decided that the projects were to be implemented as approved; and exemptions will be considered when (i) the only other option would be cancellation of the project, or (ii) the project approved is for conversion to a transitional technology, and the revised proposal is for conversion in a single step to non-transitional technology. For these cases, proposals will be submitted to the Executive Committee for individual consideration, together with the Secretariat's review and recommendations; and the revised proposals will be implemented within the level of funding already approved.

Issues with steam technology raised by the Secretariat

15. Commencing with the review of the project when it was first submitted for approval by the Executive Committee (34<sup>th</sup> Meeting), and in subsequent requests for the second tranche (38<sup>th</sup> Meeting) and the third tranche (41<sup>st</sup> Meeting), the Secretariat has consistently raised major concerns regarding the use of steam technology under the specific circumstances of the strawberry production sector in Lebanon.

16. In particular, the Secretariat had pointed out to UNIDO that a number of the fundamental conditions adding to the operating costs such as the fluctuating cost of fuel, the increased number of personnel needed to apply steam, the limited availability of farm workers, the down time related to boiler break-downs and the lack of good quality water would always be present. On this basis, the Secretariat questioned the long-term sustainability of the proposed steam technology (e.g., after the project funds are fully used), and concluded that the steam technology may not be viable. Following initial approval, the Secretariat requested that the steam technology should be re-assessed prior to purchasing additional boilers (as reported to the 41<sup>st</sup> Meeting).

17. In addressing the concerns of the Secretariat, UNIDO on each occasion indicated that the steam technology was viable, sustainable and wanted by the country. At the 41<sup>st</sup> Meeting (UNEP/OzL.Pro/ExCom/41/41), UNIDO advised the Secretariat that it “believes that this first experience in Lebanon using steam is of fundamental importance. The mastering of equipment is yet to be achieved, and the number of farmers will increase after the good results achieved in treating the soil are demonstrated. The only main issue that needs to be addressed is the price fluctuation of fuel, which was in any case foreseen. However, farmers are highly interested in this technique since it is both ozone and environment friendly. UNIDO said it considered the results so far achieved to be very encouraging and to justify an extension of the steam pasteurization”. This now appears not to be the case.

Current expenditure and scope of the project

18. The cost-effectiveness of the project for the phase-out of MB in strawberries as approved was US \$36.14/kg, in part because of the high cost of the negative pressure soil steaming technology.

19. So far, the Executive Committee has disbursed US \$1,221,946 to UNIDO for the implementation of the project (including US \$450,000 approved at the 41<sup>st</sup> Meeting). UNIDO has advised that of the total amount approved, US \$677,710 has been disbursed or already committed, with an unspent balance of US \$544,236.

20. With the funds already disbursed and committed, four steaming machines have been procured (three machines have already been delivered). However, for the reasons indicated above, the Government of Lebanon has advised that the maximum amount of MB that is likely to be permanently phased-out in strawberry production using steam is 8.4 ODP tonnes (i.e., about 15 per cent of the total sectoral consumption of 50.4 ODP tonnes). Therefore, the Government is requesting that the proposed alternative technologies address a phase-out of 42.0 ODP tonnes.

Implication of a change in technology

21. In the light of the views expressed by the Government of Lebanon and the advice now provided by UNIDO, it appears that the project cannot be implemented in its present form. If the project is to be reformulated using alternative technologies, the principal issues for consideration would appear to be (i) sustainability and (ii) incremental costs.

22. In regard to sustainability, the Executive Committee might wish to note:

- (a) The reiterated commitment by the Government of Lebanon to a permanent national reduction in aggregate consumption of controlled uses of MB and to achieve a complete phase-out by 2006, consistent with the existing Agreement with the Executive Committee (demonstrated by the phase-out to date of almost 78 ODP tonnes of MB);
- (b) The sustainability and cost-effectiveness of the alternative technologies proposed by the Government, compared to steam, as demonstrated in the field from implementation of the UNDP project; and
- (c) The ongoing capacity building activities and training programmes for farmers to sustain the phase-out of MB.

23. In regard to incremental costs, the Secretariat noted that the alternative technologies being proposed (reduced dose of alternative chemicals alone or in combination with solarization), involve substantially reduced capital and operating costs. Furthermore, many strawberry production areas are already equipped with drip irrigation systems which require minimum additional equipment at a very low cost to adopt the proposed alternative technologies. Incremental operating costs associated with the alternative technologies are nil. Therefore, the proposal to use the remaining balance (over US \$1.4 million) for implementation of the proposed alternative technologies could not be considered as eligible.

24. The Secretariat has suggested that reformulation of the project might be considered on the basis of a cost-effectiveness of US \$13.97/kg for the remaining MB consumption of 42.0 ODP tonnes, which is equal to the cost-effectiveness of the UNDP project being implemented under the same Agreement. This cost-effectiveness is proposed because the replacement alternative technologies have been demonstrated in situ; since the approval of the UNDP investment project, they have been used on farms resulting in actual phase-out of MB; and they could be easily adapted to strawberry production areas that are already equipped with drip irrigation systems.

25. On this basis, the incremental cost for the phase-out of the remaining consumption of MB in the production of strawberries would be US \$586,740. After taking account of the funds already disbursed/committed of US \$677,710, the total cost of the revised project would amount to US \$1,264,450, compared to the total amount of US \$1,821,945 approved in principle at the 34<sup>th</sup> Meeting.

26. Because funding of US \$1,221,946 has already been approved by the Executive Committee, a revised project, with costs as indicated in paragraph 25 above, would be fully funded at the level of US \$1,264,450. If this approach was adopted, a final tranche at the amount of US \$42,504 could be requested by the Government of Lebanon in 2005. The Agreement between the Government of Lebanon and the Executive Committee could be amended accordingly.

**RECOMMENDATION**

27. Based on the above comments, the Executive Committee may wish to consider the request for a change of the technology in the project for the phase-out of MB for soil fumigation in strawberry production in Lebanon.

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