APPRAISAL REPORT

HORTICULTURE AND FOOD CROPS DEVELOPMENT PROJECT

REPUBLIC OF MALAWI

COUNTRY DEPARTMENT
SOUTH REGION

SCCD: N.A.

OCDS
OCTOBER 1998
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### A. GENERAL

<table>
<thead>
<tr>
<th>Year</th>
<th>Malawi</th>
<th>Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>118</td>
<td>30.305</td>
</tr>
</tbody>
</table>

- **Population size (in million):**
  - 1996: 11.37
  - 1995: 9.8

- **Population six-five years and over (%):**
  - 1994: 4
  - 1993: 5

- **Dependency ratio:**
  - 1990: 104
  - 1994: 92.3

- **Urban Population %:**
  - 1995: 30.1
  - 1990: 24

- **Rural Population (%):**
  - 1990: 87

- **Population per sq. km of arable land:**
  - 1985: 304
  - 1995: 300

- **Adult Literacy Rate (Total):**
  - Male: 56.4
  - Female: 53

- **Labour Force Participation Rate (%):**
  - Male: 70.38
  - Female: 55

- **GNP per habitant (USD):**
  - 1996: 180

- **Annual growth rate of GNP (%):**
  - 1993: -1.2

### B. DEMOGRAPHIC INDICATORS

<table>
<thead>
<tr>
<th>Year</th>
<th>Malawi</th>
<th>Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>3.1</td>
<td>2.7</td>
</tr>
</tbody>
</table>

- **Urban population growth rate (%):**
  - 1992: 6.9

- **Crude death rate (per 1000 population):**
  - 1995: 20.50

- **Infant mortality rate (per 1000 live birth):**
  - 1995: 132

- **Child mortality rate (<1000 child age 1 - 4):**
  - 1995: 215

- **Maternal mortality rate (per 100000 live birth):**
  - 1995: 620

- **Life expectancy at birth (years):**
  - Male: 44.80

- **Crude birth rate (per 1000 pop.):**
  - 1995: 50.40

- **Total fertility rate (No of children):**
  - 1995: 7.05

- **Median age:**
  - 1995: 17

- **Population doubling time (years):**
  - 1990: 20

- **Women of child bearing age (% of all women):**
  - 1991: 45

- **Proportion of women using contraceptive (%):**
  - 1993: 13

### C. HEALTH & NUTRITIONAL INDICATORS

<table>
<thead>
<tr>
<th>Year</th>
<th>Malawi</th>
<th>Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>27000</td>
<td>18000</td>
</tr>
</tbody>
</table>

- **Population per physician:**
  - 1990: 14000

- **Access to safe water:**
  - 1995: 54

- **Percentage of fully immunized children:**
  - 1995: 98

- **Average per capita calorie intake:**
  - 1990: 2049

- **Babies born with birth weight <2500 gm (%):**
  - 1990: 20

- **Percentage of GNP spent on health:**
  - 1990: 5

- **Average per capita spending on health (USD):**
  - 1990: 11

### D. EDUCATION INDICATORS

<table>
<thead>
<tr>
<th>Year</th>
<th>Malawi</th>
<th>Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>120</td>
<td>79</td>
</tr>
</tbody>
</table>

- **Gross enrolment ratio:**
  - Primary School Total: 1994
  - Secondary School Total: 1994

- **Percentage of GDP spent on education:**
  - 1991: 3.4

### Source:
- The State of World Population 1991, UNFPA
- Africa Recovery No.3, 1991, UN
- The World Health Report, 1996
- World Bank Development Report, 1993
- La situation des enfants dans le monde/UNICEF 1996
- The World Health Report, WHO 1996
- Human Development Report, UNDP 1995

### Notes:
- Natural rate of increase only
CURRENCY AND MEASURES

Currency Equivalents
(As of August 1998)

<table>
<thead>
<tr>
<th>Currency Unit</th>
<th>=</th>
<th>Malawi Kwacha</th>
</tr>
</thead>
<tbody>
<tr>
<td>UA 1</td>
<td>=</td>
<td>MWK 35.5184</td>
</tr>
<tr>
<td>MWK1</td>
<td>=</td>
<td>UA 0.0281544</td>
</tr>
<tr>
<td>UA 1</td>
<td>=</td>
<td>USD 1.34222</td>
</tr>
</tbody>
</table>

Weights and Measures

<table>
<thead>
<tr>
<th>Metric Ton (mt)</th>
<th>=</th>
<th>2,200 lbs (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kilogram (kg)</td>
<td>=</td>
<td>2.2 lbs (pounds)</td>
</tr>
<tr>
<td>Metre (m)</td>
<td>=</td>
<td>3.28 ft (feet)</td>
</tr>
<tr>
<td>Kilometre (km)</td>
<td>=</td>
<td>0.62 miles</td>
</tr>
<tr>
<td>Hectare (ha)</td>
<td>=</td>
<td>2.471 acres</td>
</tr>
</tbody>
</table>

FISCAL YEAR

July 1 - June 30
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADB</td>
<td>African Development Bank</td>
</tr>
<tr>
<td>ADD</td>
<td>Agricultural Development Division</td>
</tr>
<tr>
<td>ADF</td>
<td>African Development Fund</td>
</tr>
<tr>
<td>ALDSAP</td>
<td>Agriculture and Livestock Development Strategy and Action Plan</td>
</tr>
<tr>
<td>AMINA</td>
<td>African Development Fund for Micro-Finance Investment for Africa</td>
</tr>
<tr>
<td>AMTA</td>
<td>Agricultural Management Training for Africa</td>
</tr>
<tr>
<td>amsl</td>
<td>above mean sea level</td>
</tr>
<tr>
<td>BCA</td>
<td>Bunda College of Agriculture of the University of Malawi</td>
</tr>
<tr>
<td>CCs</td>
<td>Collection Centers</td>
</tr>
<tr>
<td>CMB</td>
<td>Central Marketing Board</td>
</tr>
<tr>
<td>DARTS</td>
<td>Department of Agricultural Research and Technical Services</td>
</tr>
<tr>
<td>DOI</td>
<td>Department of Irrigation</td>
</tr>
<tr>
<td>DOCP</td>
<td>Department of Crop Production</td>
</tr>
<tr>
<td>EMA</td>
<td>Environment Management Act</td>
</tr>
<tr>
<td>EPA</td>
<td>Extension Planning Area</td>
</tr>
<tr>
<td>Fcs</td>
<td>Farmer Clubs</td>
</tr>
<tr>
<td>FLS</td>
<td>Front Line Staff</td>
</tr>
<tr>
<td>FGLs</td>
<td>Farmer Group leaders</td>
</tr>
<tr>
<td>GOM</td>
<td>Government of Malawi</td>
</tr>
<tr>
<td>HDP</td>
<td>Horticulture and Food Crops Development Project</td>
</tr>
<tr>
<td>ITF</td>
<td>Irrigation Task Force</td>
</tr>
<tr>
<td>JICA</td>
<td>Japanese International Collaboration Agency</td>
</tr>
<tr>
<td>LMB</td>
<td>Local Marketing Board</td>
</tr>
<tr>
<td>MASIP</td>
<td>Malawi Agriculture Sector Investment Programme</td>
</tr>
<tr>
<td>MEPC</td>
<td>Malawi Export Promotion Council</td>
</tr>
<tr>
<td>MFI</td>
<td>Micro-Finance Intermediary</td>
</tr>
<tr>
<td>MK</td>
<td>Malawi Kwacha</td>
</tr>
<tr>
<td>MOAI</td>
<td>Ministry of Agriculture and Irrigation</td>
</tr>
<tr>
<td>MUSCCO</td>
<td>Malawi Union of Savings and Credit Cooperatives</td>
</tr>
<tr>
<td>NBM</td>
<td>National Bank of Malawi</td>
</tr>
<tr>
<td>NEAP</td>
<td>National Environment Action Plan</td>
</tr>
<tr>
<td>NEP</td>
<td>National Environment Policy</td>
</tr>
<tr>
<td>NIPADS</td>
<td>National Irrigation Policy and Development Strategy</td>
</tr>
<tr>
<td>NRC</td>
<td>Natural Resource College</td>
</tr>
<tr>
<td>PMO</td>
<td>Project Management Office</td>
</tr>
<tr>
<td>Pms</td>
<td>Programme Managers</td>
</tr>
<tr>
<td>PRA</td>
<td>Participatory Rural Appraisal</td>
</tr>
<tr>
<td>PY</td>
<td>Project Year</td>
</tr>
<tr>
<td>RDP</td>
<td>Rural Development Project</td>
</tr>
<tr>
<td>SCCBU</td>
<td>Saving and Credit Community Based (self-owned) Unions</td>
</tr>
<tr>
<td>ShIP</td>
<td>Smallholder Irrigation Project</td>
</tr>
<tr>
<td>UA</td>
<td>Unit of Account</td>
</tr>
<tr>
<td>VDC</td>
<td>Village Development Committee</td>
</tr>
<tr>
<td>WAB</td>
<td>Water Association Bond</td>
</tr>
<tr>
<td>WFP</td>
<td>World Food Programme</td>
</tr>
<tr>
<td>WPS</td>
<td>Woman Program Section</td>
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LIST OF TABLES

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Page</th>
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<tbody>
<tr>
<td>4.1</td>
<td>Summary of Project Cost Estimates by Component</td>
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<td>4.2</td>
<td>Summary of Project Cost by Category of Expenditure</td>
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</tr>
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<td>5.1</td>
<td>Procurement Arrangements</td>
<td>22</td>
</tr>
<tr>
<td>5.2</td>
<td>Expenditure Schedule by Component</td>
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<tr>
<td>5.3</td>
<td>Expenditure Schedule by Source of Finance</td>
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</tr>
</tbody>
</table>

LIST OF ANNEXES

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>No. of Pages</th>
</tr>
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<tbody>
<tr>
<td>Annex 1A</td>
<td>Map of Malawi: Project Area</td>
<td>1</td>
</tr>
<tr>
<td>Annex 1B</td>
<td>Project Area and Targeted Farmers</td>
<td>1</td>
</tr>
<tr>
<td>Annex 2</td>
<td>Environmental Summary</td>
<td>1</td>
</tr>
<tr>
<td>Annex 3</td>
<td>Provisional List of Goods and Services</td>
<td>1</td>
</tr>
<tr>
<td>Annex 4</td>
<td>Tentative Implementation Schedule</td>
<td>1</td>
</tr>
<tr>
<td>Annex 5</td>
<td>Crop Production Budget</td>
<td>1</td>
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<tr>
<td>Annex 6</td>
<td>Economic Internal Rate of Return (EIRR)</td>
<td>2</td>
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</table>
8. SOURCES OF FINANCE

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF</td>
<td>UA 6.23 million</td>
</tr>
<tr>
<td>TAF</td>
<td>UA 1.26 million</td>
</tr>
<tr>
<td>Government Contribution</td>
<td>UA 1.00 million</td>
</tr>
<tr>
<td>Beneficiaries Contribution</td>
<td>UA 0.60 million</td>
</tr>
<tr>
<td>Donor Contribution</td>
<td>UA 0.58 million</td>
</tr>
<tr>
<td>TOTAL COST</td>
<td>UA 9.67 million</td>
</tr>
</tbody>
</table>

9. DATE OF APPROVAL: December 1998

10. ESTIMATED STARTING DATE OF PROJECT: March 1999

11. PROJECT DURATION: Five years

12. PROCUREMENT: Project goods, works and services to be financed by the Fund will be procured according to the ADF Rules and Procedures for procurement using the Fund's Standard Bidding Documents.

13. CONSULTANCY SERVICES REQUIRED AND STAGE OF SELECTION:

A project manager and an accountant will be required for five years each. A marketing specialist/expert and an accountant will be recruited for three years each to manage the marketing structure component. Two Civil Engineers with experience in irrigation, an environmentalist and a Participatory Rural Appraisal (PRA) specialist will be recruited for training in the use of the survey and soil equipment, supervision of the civil works design, monitoring of environmental mitigative measures, and training in marketing techniques respectively. A number of short-term consultants will be required for the irrigation and marketing civil works. In addition, short term consultants will be required for marketing studies and environmental impact assessment studies. Other technical assistant will be recruited through the NGOs and the MFI for training in credit management. Audit services will also be procured through Short Listing. Selection process will commence as soon as the Board approves the loan.
SUMMARY, CONCLUSION AND RECOMMENDATIONS

1. BORROWER : Government of Malawi
2. EXECUTING AGENCY : Ministry of Agriculture and Irrigation (MOAI)
3. ADF LOAN : Not exceeding UA 6.23 Million

TERMS

i) Duration : Fifty (50) years including a grace period of 10 years.
ii) Service Charge : 0.75% per annum on amounts disbursed and outstanding.
iii) Commitment Charge : 0.5% on the undisbursed portion of the loan, 120 days after signature of the loan Agreement.
iv) Repayment : 1% of principal loan amount payable annually from the eleventh (11th) year after the signing of the Loan Agreement through the twentieth (20th) year and 3% per annum thereafter.

GRANT

ADF/TAF : Not exceeding UA 1.26 million

4. PURPOSE OF THE LOAN AND GRANT

The ADF Loan will finance 76% of the foreign exchange costs amounting to UA 4.34 million and also part of the local cost of the project. This will amount to UA 1.89 or 20% of total project cost. The grant will finance capacity building and training of project staff.

5. THE PROJECT

a) Objective

The sector goal is to improve the well being of Malawians through poverty alleviation, especially among rural people, by promoting broad based and accelerated agricultural development. Specifically, the objective is to contribute to food security by increasing agriculture productivity and farm income of the smallholder target group through better access to small-scale irrigation, horticulture and marketing development.

b) Description

To achieve the above objective, the project design has taken into consideration five main components. These are: i) Capacity Building of the following departments: Irrigation, Crop Production and Research of Ministry of Agriculture and Irrigation; ii) Establishment of a Micro-Finance Credit System; iii) Establishment of Small-Scale Irrigation Schemes; iv) Establishment of a Marketing Structure; and v) Project Management Office.
6. PROJECT COST

The total cost of the project including physical and price contingencies is estimated at UA 9.67 million. The foreign exchange component is UA 5.75 million i.e. 59% of the total project cost. A summary of the project cost is shown in the table below.

<table>
<thead>
<tr>
<th>Components</th>
<th>(In MK Million)</th>
<th>(In UA Million)</th>
<th>% F.E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Foreign Exchange</td>
<td>Local Costs</td>
<td>Total Costs</td>
</tr>
<tr>
<td>A. Capacity Building and Training</td>
<td>45.82</td>
<td>17.40</td>
<td>63.22</td>
</tr>
<tr>
<td>B. Rural Micro-Finance System</td>
<td>57.19</td>
<td>24.15</td>
<td>81.34</td>
</tr>
<tr>
<td>C. Small-Scale Irrigation Schemes</td>
<td>40.49</td>
<td>36.23</td>
<td>76.72</td>
</tr>
<tr>
<td>D. Establishment of a Marketing Structure</td>
<td>28.06</td>
<td>17.40</td>
<td>45.46</td>
</tr>
<tr>
<td>E. Project Management</td>
<td>10.66</td>
<td>29.13</td>
<td>39.79</td>
</tr>
<tr>
<td>Total Base Cost</td>
<td>182.22</td>
<td>124.31</td>
<td>306.53</td>
</tr>
<tr>
<td>Physical Contingency</td>
<td>10.30</td>
<td>6.75</td>
<td>17.05</td>
</tr>
<tr>
<td>Price Contingency</td>
<td>11.72</td>
<td>8.17</td>
<td>19.89</td>
</tr>
<tr>
<td>Total Project Cost</td>
<td>204.24</td>
<td>139.23</td>
<td>343.47</td>
</tr>
</tbody>
</table>

7. SUMMARY OF PROJECT COST BY CATEGORY OF EXPENDITURE

The total project cost by category of expenditure is summarized in the table below:

<table>
<thead>
<tr>
<th>Category of Expenditure</th>
<th>(In MK Million)</th>
<th>(In UA Million)</th>
<th>% F.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Foreign Exchange</td>
<td>Local Costs</td>
<td>Total Costs</td>
</tr>
</tbody>
</table>
| 1. Goods and Equipment | 19.89 | 4.26 | 24.15 | 0.56 | 0.12 | 0.68 | 82%
| 2. Credit for Goods & Equipment | 46.53 | 10.30 | 56.83 | 1.31 | 0.29 | 1.60 | 82%
| 3. Civil Works | 46.53 | 17.05 | 63.58 | 1.31 | 0.48 | 1.79 | 73%
| 4. Training and Studies | 13.85 | 9.23 | 23.08 | 0.39 | 0.26 | 0.66 | 60%
| 5. Technical Assistance (Local) | 0.00 | 4.62 | -4.62 | 0.00 | -0.13 | -0.13 | 0%
| 6. TA & Consultancy Services (Int'l) | 22.73 | -0.00 | 22.73 | 0.64 | 0.00 | 0.64 | 100%
| 7. Farm Inputs and Local Material | 10.66 | 18.11 | 28.77 | 0.30 | 0.51 | 0.81 | 37%
| 8. Operation & Maintenance | 22.03 | 9.59 | 31.62 | 0.62 | 0.27 | 0.89 | 70%
| 9. Government | 0.00 | 31.97 | 31.97 | 0.00 | 0.90 | 0.90 | 0%
| 10. Beneficiaries | 0.00 | 19.18 | 19.18 | 0.00 | 0.54 | 0.54 | 0%
| Total Base Cost | 182.22 | 124.31 | 306.53 | 5.13 | 3.50 | 8.63 |
| Physical Contingency | 10.30 | 6.75 | 17.05 | 0.29 | 0.19 | 0.48 |
| Price Contingency | 11.72 | 8.17 | 19.89 | 0.33 | 0.23 | 0.56 |
| Total Project Cost | 204.24 | 139.23 | 343.47 | 5.75 | 3.92 | 9.67 | 60.0% |
8. SOURCES OF FINANCE

The financial plan of the project is summarized in the following table:

<table>
<thead>
<tr>
<th>Source</th>
<th>Foreign Exchange</th>
<th>Local Costs</th>
<th>Total Costs</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF</td>
<td>4.34</td>
<td>1.89</td>
<td>6.23</td>
<td>64.4</td>
</tr>
<tr>
<td>TAF</td>
<td>0.83</td>
<td>0.43</td>
<td>1.26</td>
<td>13.0</td>
</tr>
<tr>
<td>Government</td>
<td>0.00</td>
<td>1.00</td>
<td>1.00</td>
<td>10.3</td>
</tr>
<tr>
<td>Beneficiaries</td>
<td>0.00</td>
<td>0.60</td>
<td>0.60</td>
<td>6.3</td>
</tr>
<tr>
<td>JICA</td>
<td>0.58</td>
<td>0.00</td>
<td>0.58</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>5.75</strong></td>
<td><strong>3.92</strong></td>
<td><strong>9.67</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

The ADF loan of UA 6.23 million will finance 76% of the entire foreign exchange costs estimated at UA 4.34 million and part of the local costs amounting to UA 1.89 million i.e. 20% of the total project cost. The TAF grant will finance 13% of the total costs for institutional and technical capacity building which will include provision of training in irrigation and horticultural technologies, marketing techniques, consultants, technical assistance, studies as well as the provision of survey, soil water and water flow measuring equipment and office equipment. The Government will finance UA 1.00 million of the total project costs which will include Government staff salaries, rental cost for the PMO offices, the land and design work for construction of market depots and collection centers, and salaries of some off-campus professors who will teach at NRC periodically. The project beneficiaries will contribute about 6.3% of the total project cost by providing free labour for construction of on-farm irrigation canals and digging of boreholes for treadle pumps. Their total contribution will amount to UA 0.60 million. It is expected that JICA will contribute UA 0.58 million i.e 6% of the total project cost in terms of training for MOAI staff and provision of volunteers as technical assistance.

9. EXPENDITURE SCHEDULE BY COMPONENT AND SOURCE OF FINANCE

<table>
<thead>
<tr>
<th>Source of Finance</th>
<th>FY1</th>
<th>FY2</th>
<th>FY3</th>
<th>FY4</th>
<th>FY5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF</td>
<td>1.47</td>
<td>1.91</td>
<td>1.42</td>
<td>0.89</td>
<td>0.54</td>
<td>6.23</td>
</tr>
<tr>
<td>TAF</td>
<td>0.75</td>
<td>0.25</td>
<td>0.11</td>
<td>0.12</td>
<td>0.03</td>
<td>1.26</td>
</tr>
<tr>
<td>Government</td>
<td>0.32</td>
<td>0.18</td>
<td>0.18</td>
<td>0.16</td>
<td>0.16</td>
<td>1.00</td>
</tr>
<tr>
<td>Beneficiaries</td>
<td>0.08</td>
<td>0.18</td>
<td>0.19</td>
<td>0.15</td>
<td>0.00</td>
<td>0.60</td>
</tr>
<tr>
<td>JICA</td>
<td>0.18</td>
<td>0.13</td>
<td>0.13</td>
<td>0.14</td>
<td>0.00</td>
<td>0.58</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>2.80</td>
<td>2.65</td>
<td>2.03</td>
<td>1.46</td>
<td>0.73</td>
<td>9.67</td>
</tr>
</tbody>
</table>
Expenditure Schedule by Component
(In UA Million)

<table>
<thead>
<tr>
<th>Components</th>
<th>FY1</th>
<th>FY2</th>
<th>FY3</th>
<th>FY4</th>
<th>FY5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Capacity Building and Training</td>
<td>0.96</td>
<td>0.40</td>
<td>0.27</td>
<td>0.27</td>
<td>0.06</td>
<td>1.96</td>
</tr>
<tr>
<td>B. Rural Micro-Finance System</td>
<td>0.39</td>
<td>0.49</td>
<td>0.64</td>
<td>0.66</td>
<td>0.42</td>
<td>2.60</td>
</tr>
<tr>
<td>C. Small-Scale Irrigation Schemes</td>
<td>0.45</td>
<td>1.00</td>
<td>0.74</td>
<td>0.27</td>
<td>0.00</td>
<td>2.46</td>
</tr>
<tr>
<td>D. Estab. of a Marketing Structure</td>
<td>0.72</td>
<td>0.53</td>
<td>0.14</td>
<td>0.00</td>
<td>0.00</td>
<td>1.39</td>
</tr>
<tr>
<td>E. Project Management</td>
<td>0.28</td>
<td>0.23</td>
<td>0.24</td>
<td>0.26</td>
<td>0.25</td>
<td>1.26</td>
</tr>
<tr>
<td><strong>GRAND TOTAL</strong></td>
<td>2.80</td>
<td>2.65</td>
<td>2.03</td>
<td>1.46</td>
<td>0.73</td>
<td>9.67</td>
</tr>
</tbody>
</table>

10. IMPLEMENTATION

The project will be implemented over a five-year period with 1999 being PY1. The establishment of the Project Management Office (PMO), shortlisting and selection of the NGOs for formation and training of farmer groups as well as capacity building activities will commence during the first year of the project. Construction of marketing depots, formation of marketing boards and training of DOI and DOCP staff and farmers groups leaders, design, construction of irrigation canals and rehabilitation of earth dams will also start in project year 1 and continue into project year 4. There will be a mid term review in project year 3. Farmer groups formation and training through NGOs will continue throughout project implementation from year 1 to 5.

11. PROCUREMENT OF GOODS AND SERVICES

Procurement of goods, works and acquisition of consulting services financed by the ADF will be in accordance with the Fund’s Rules of Procedure for Procurement of Goods and Works or, as appropriate, Rules of Procedure for the Use of Consultants, Contracts for vehicles and office equipment will be awarded under International Competitive Bidding (ICB) procedures. Large irrigation equipment will be procured through ICB. Small irrigation equipment will be procured using NCB. Survey, soil and water flow measuring equipment will be procured using National Competitive Bidding (NCB). Food processing equipment will be procured using National Shopping (NS). The materials needed for on-farm canals, land levelling and collection centers are diversified and readily available off-the shelf goods; these will be procured through NS. Procurement of civil works for main irrigation canals will be carried out under ICB procedures. Procurement of civil works for the market depots will be carried out through ICB procedures. Procurement of Technical Assistant, Short Term Consultancy Services, External Auditor and the use of local specialized agencies or NGOs working in Malawi, will be on the basis of Short List.

12. CONCLUSIONS AND RECOMMENDATIONS

The Horticulture and Food Crops Development project is in line with the ADF VII Policy and strategy of poverty alleviation. The proposed project conforms to the Government’s objectives of improving smallholder crop production by promoting the adoption of improved irrigation and horticultural technology to farmers and by providing the
necessary capacity building for irrigation, marketing, credit and institutional support to stimulate sustainable agricultural development. The irrigation technology to be promoted is simple and as it will be backed by intensive farmer and staff training; thus it will be mastered within a reasonably short period.

Poverty alleviation strategy of the project is conceived within the framework of total beneficiary participation. The incorporation of two NGOs and a financial intermediary to train, implement and manage credit for the project will minimize Government intervention, strengthen decentralization and participatory community development. Farmer Clubs and Savings and Credit Community Based Unions (SCCBU) will be involved in planning, implementing and managing, especially, the credit component with a built-in-mechanism for credit recovery. This will create ownership and sustain project activities after the project implementation period. Contribution to the investment in the construction of on-farm canals by the beneficiaries will also provide ownership of the project and further enhance the maintenance of infrastructural facilities and add to the sustainability of the project.

Improved food security situation of the beneficiaries will be achieved through increased production of food and horticultural crops. This will result in higher income accrual at household levels, specifically, for rural women, the youth and children and better nutrition and health. The development of rural infrastructure will further help the rural women to have better access to markets for small scale trading activities usually carried out by women. Communities outside the target groups will also benefit from improved access to markets and higher levels of employment generation due to project related activities.

Participation of rural women smallholder farmers and the youth in training, farmer clubs and credit unions will empower them to assimilate higher levels of farming technology and also boost their confidence and self respect. These project activities will further assist rural women to achieve higher social status which is vital for the success of any development effort. The project, therefore, is economically and financially viable, and socially desirable.

**Recommendations and Conditions for Loan Approval**

It is recommended that an ADF Loan not exceeding UA 6.23 million and a TAF grant not exceeding UA 1.26 million be granted to the Government of Malawi for the purpose of implementing the project as described in this appraisal report subject to the following conditions.

A) **Conditions Precedent to Entry Into Force**

Prior to entry into force, the borrower shall have:

- i) established a Project Management Office (PMO) based in Lilongwe and the appointment of the required professional and support staff whose qualifications and experience are acceptable to the Fund (section 5.2);

- ii) opened a special account for the project funds with a commercial bank acceptable to the Fund and which has branches in each of the Agricultural Development
(vi)

Divisions (ADDs) covered by the project (para 5.3.1);

iii) submitted a written undertaking that any allocation of land to be used for the Project, including customary land, shall be carried out fairly in accordance with the laws of Malawi (para 3.4.1);

iv) submitted a written undertaking concerning allocation of land to be used for the construction of four marketing depots in each of the Agricultural Development Divisions (ADDs) and collection centers in each of the Extension Planning Areas (EPAs) covered by the project (para 4.3.18);

v) submitted a written undertaking concerning that it will submit a list of staff to be trained through Japanese International Cooperation Agency (JICA) as well as a written request to JICA for voluntarily technical assistant before June 1999 (paras 4.3.2 and 4.6.1).

B) Other Conditions

1. Provide evidence that its contribution to the project is reflected on an annual basis in the MOAI budget;

2. Prior to any disbursement of the funds for the credit component of the project:

(i) the Borrower and National Bank of Malawi (NBM) shall have executed, in a form satisfactory to the Fund, a binding and unconditional agreement for the administration of the funds for the credit component;

(ii) the Borrower and the MFI shall have executed, in a form satisfactory to the Fund, a binding and unconditional agreement for the on-lending of the credit portion of the Loan funds to the beneficiary farmers; and submitted to the Fund a copy of the model agreement.
### Project Matrix

**Malawi: Horticulture and Food Crops Development Project (HDP)**

**Logical Framework**

<table>
<thead>
<tr>
<th>Narrative Summary (NS)</th>
<th>Measurable Performance Indicators (MPIs)</th>
<th>Means of Verifications (MOV)</th>
<th>Important Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Reduce poverty among rural people by promoting broad based and accelerated agriculture development.</td>
<td>1.1 Average farm income significantly increased; 1.2 Simple technology of high-return promoted to and adopted by farmers.</td>
<td>1.1 Statistics of MOAI 1.2 Statistical Government publication.</td>
<td>(Goal to Supergoal) 1.1 Gov. reform programme remains on track 1.2 Adequate Government support to the project 1.3 Favourable prices to sustain production</td>
</tr>
<tr>
<td><strong>Project Objective:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Agriculture productivity and farm income of the smallholder target group increased through better access to small-scale irrigation, horticulture and marketing development.</td>
<td>1.1 Irrigated land increased by 3,400 ha in 25 EPAs by PY5; 1.2 Average farm income per 0.4 ha increase from US$ 62 to 515 annually by PY6; 1.3 Irrigated land will be cultivated 2.5 times per year and productivity will increase more than 2.2 times by end of PY5; 1.4 Target group form and manage 350 Farmer Clubs and 12 Credit Unions by PY5; 1.5 Improved nutritional status. 1.6 Progressive change from hatched houses to corrugated sheets 1.7 Improved human resource mobility (bicycles and motorcycles).</td>
<td>1.1 Base-line data and sample surveys; 1.2 Sample surveys for target groups; 1.3 MOAI files and records;</td>
<td>1.1 Low probability of drought 1.2 Adequate and timely supply of inputs 1.3 Adequate institutional capacity for agricultural sector; 1.4 Adequate supervision and appropriate technology transfer 1.2 Accredited Financial intermediary to manage and administer credit. 1.3 Project Beneficiaries are responsive</td>
</tr>
<tr>
<td><strong>Outputs:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Building institutional capacity in irrigation, horticultural and marketing technology in the project area;</td>
<td>1.1 Survey, soil, water flow and soil sampling practices in DOI, 4 ADDs and 8 nurseries for research stations and DOCP improved by end of PY5; 1.2 166 extension Front Line Staff, 370 Farmer Group Leaders, and 108 Subject Matter Specialists trained in irrigation, horticulture, and food processing technologies by end of PY2; 1.3 Capacity of the two DOI, DOCP, and Research significantly improved by PY2;</td>
<td>1.1 PMO’s files and records; 1.2 DOI files and records at ADDs and RDPs levels;</td>
<td>1.1 Same as above 1.2 Trained staff efficient and accountable to the project</td>
</tr>
<tr>
<td>2. Establishment of a credit system and efficiently managed by NGOs;</td>
<td>2.1 850 farmers reached, 30 Fcs grouped and trained by one NGO each year covering 2-3 EPAs starting PY1; 2.2 1,700 farmers (60 Fcs) reached and facilitated by the credit services by MFI covering 5 EPAs each year starting PY1; 2.3 Farmers voluntarily participate in formation of farmer groups/clubs and Credit Unions starting PY1; 2.4 UA 2.6 million efficiently utilized for credit.</td>
<td>1.1 Same as above</td>
<td>2.1 Farmer Groups adopt new technologies and credit system provided by the project; 2.2 Market interest rate is affordable by small-holder farmers in the project area.</td>
</tr>
<tr>
<td>Narrative Summary (NS)</td>
<td>Measurable Performance Indicators (MPIs)</td>
<td>Means of Verifications (MOV)</td>
<td>Important Assumptions</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------------------------------</td>
<td>-----------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>3. Establishment of small-scale irrigation schemes and managed by farmers;</td>
<td>3.1 Needs assessment prepared for about 60 Fcs starting PY1; 3.2 395 ha irrigated by treadle pump by PY5; 3.4 1,398 ha irrigated by motorized pumps by end of PY5; 3.5 1,590 ha irrigated by canals and lifting pumps irrigation systems by end of PY5; 3.6 25 earth dams rehabilitated by end of PY5; 3.7 431 tubewells established by end of PY5; 3.8 A total of 57.6 km irrigation canals established by end of PY5; 3.9 A total of 41.5 km drainage canals established by end of PY5;</td>
<td>Same as above</td>
<td>3.1 Cost of irrigation equipment affordable by farmers; 3.2 Project Beneficiaries are responsive to prepare their fields for water distribution and maintenance of pumps. 3.3 Farmers are willing to participate in labour work in their fields.</td>
</tr>
<tr>
<td>4. A marketing structure establishment and efficiently managed by marketing boards and representatives farmers;</td>
<td>4.1 Five marketing boards established by end of PY3; 4.2 Four marketing deposits established at 4 ADDs and managed by end of PY3; 4.3 25 collection centers for marketing established at 25 EPAs by end of PY3;</td>
<td>Same as above</td>
<td>4.1 Marketing information and channels regularly provided and used by farmers; 4.2 Local market capacity is sufficient to absorb surplus of crop production; 4.3 Commercial crop prices promote marketing activities for surplus of production.</td>
</tr>
<tr>
<td>5. Project Management Office established at Lilongwe and efficiently coordinating the project implementation.</td>
<td>5.1 PMO staff well qualified and efficiently implementing the project as scheduled. 5.2 PMO meeting the above performance indicators.</td>
<td>Same as above</td>
<td>5.1 Timely recruitment of PMO staff, Tas and short term consultants</td>
</tr>
</tbody>
</table>

### 4. Activities

<table>
<thead>
<tr>
<th>Inputs and Resources</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Accon:ts Department records</td>
<td>0.96</td>
<td>0.40</td>
<td>0.27</td>
<td>0.27</td>
<td>0.06</td>
</tr>
<tr>
<td>1.2 M &amp; E records</td>
<td>0.39</td>
<td>0.49</td>
<td>0.64</td>
<td>0.66</td>
<td>0.42</td>
</tr>
<tr>
<td>1.3 FLAD Disbursement records</td>
<td>0.45</td>
<td>1.00</td>
<td>0.74</td>
<td>0.27</td>
<td>0.00</td>
</tr>
<tr>
<td>1.4</td>
<td>0.72</td>
<td>0.53</td>
<td>0.14</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>1.5</td>
<td>0.28</td>
<td>0.23</td>
<td>0.24</td>
<td>0.26</td>
<td>0.25</td>
</tr>
</tbody>
</table>

1.1 Efficient executing agency satisfactory coordination among participating ministries.
1. INTRODUCTION AND BACKGROUND

1.1 Origin and History of the Project

1.1.1 With a total land area of 119,140 km² Malawi is bordered by Tanzania in the North and North West, Zambia in the West and Mozambique in the East, South and South West. Out of its total land area, 24,200 km² comprise Lake Malawi and other smaller lakes. It stretches from latitude 9° 45' to 17° 5' south of the equator for about 900 km in length from north to south, and varying in width from 80 to 160 km. Malawi is one of the most densely populated countries in sub-Saharan Africa. Its population is currently estimated at about 11.37 million with an average growth rate of 3.3% per year. Approximately 87% of the total population lives in the rural areas.

1.1.2 Malawi is not endowed with many natural resources. Its main resource base is agriculture which plays a key role in the country’s economy and accounts for 43% of GDP. The economy of the country is heavily dependent on rainfed agriculture by smallholder farmers. A study prepared in 1996 by the World Food Programme (WFP), USAID and Government of Malawi (GOM) on Vulnerability Assessment and Mapping (VAM) estimated that rural per capita income is at US$ 66.00 per annum with the poorest area being as low as US$ 35.00 per annum. This classifies Malawi as one of the poorest countries in the world.

1.1.3 Recent droughts have greatly affected agriculture production, and made rainfed agriculture unreliable means of achieving sustainable food security, particularly with the increasing population growth. Development of the sector is therefore central in the Government’s effort to reduce poverty. In 1995, the Government of Malawi (GOM) produced the Agricultural and Livestock Development Strategy and Action Plan (ALDSAP) with emphasis on rural poverty alleviation. This Action Plan continue to be the basis for formulating Malawi Agricultural Sector Investment Programme (MASIP).

1.1.4 On June 30, 1998, the Bank received a request from the Government of Malawi to consider funding of the Horticulture and Food Crops Development Project, which is a very high priority area in the Government’s effort to improve the food security situation and for employment generation in the rural areas. In this connection, a Bank preparation/appraisal mission was launched during September 1998. The mission held discussions with all the stakeholders including the donor community to ensure that the project does not duplicate ongoing donor activities in the sub-sector and/or in the proposed project area. This report reflects the mission’s findings and agreements reached with the Government.

1.1.5 The project is in line with the ADF-VII development strategy which lays emphasis on poverty alleviation. It further proposes a smallholder strategy, especially for women and the youth, for income generation and improved household food security. The project also supports the Government development objective of eradicating poverty through the diversification of the economic base, especially the agriculture sector consistent with a broad base growth strategy.

1.2 Performance of Similar Projects in Malawi
1.2.1 The Bank Group has financed a total of 14 projects in Malawi. The commitments to the agricultural sector account for 27% (UA 83.54) of the total. So far 6 agricultural projects are on-going, of which, 2 are rural development projects, one agricultural service, one forestry and one livestock development project. The Rural Income Enhancement Project has not been declared effective.

1.2.2 Performance of these projects have improved in recent times and have been rated satisfactory with an exception of the National Livestock Project, which faced a number of institutional constraints. The Bank has restructured the project and the Government has informed the Bank that all the conditions laid down by the Bank have been fulfilled. A Bank mission will be scheduled early next year to review the situation and make appropriate recommendations regarding the project implementation.

2. THE AGRICULTURAL SECTOR

2.1 Salient Features

2.1.1 Agriculture is the mainstay of Malawi's economy. The sector continues to play a central role in the social and economic activities of the nation. It contributes 43% of the Gross Domestic Products (GDP), of which 27% originates from the smallholder. Furthermore, it accounts for 90 to 95% of total export earnings of which tobacco, tea and sugar alone account for over 60%. The sector directly employs 87% of the work force and provides raw materials for about two-thirds of the manufacturing sector.

2.1.2 Structure: The agricultural sector is dualistic in nature consisting of (i) relatively large scale, modern estates and (ii) smallholder farms. Of the 5.3 million ha, suitable for cultivation, about 0.9 million ha belong to the estate sector while 3.8 million ha are under smallholder sector. The Smallholder Sector occupies about 80% of total cropped area. Their farm sizes vary across the country, with 55% of all smallholders cultivating less than 1 ha; 31% between 1 ha and 2 ha and 14% more than 2 ha. Smallholders are engaged mainly in subsistence farming and cultivate a variety of crops including maize, pulses, sorghum, millet, cowpeas, soya beans and pigeon peas, potatoes and cassava. The estate sector is engaged primarily in the production of tobacco, coffee, tea and sugar.

2.2 Performance of the Agricultural Sector

Agricultural growth rate has varied widely over the year. In the 1970s it grew by nearly 5%, in the early 1980s by 1% and, from 1987 to 1990 by 2.7%. From 1992 to 1994, the agricultural-sector experienced a negative growth rate, mainly due to two major droughts in 1991 and 1993 respectively. Following reasonable rains and subsidized distribution of seed and fertilizer to smallholder farmers in 1994, the country enjoyed a good harvest in 1995. Maize production, for example, increased from 941,500 tonnes to 2,038,000 tonnes in 1995/96 season. In 1994/95 season, agricultural production grew by a robust 29.7 percent and in 1995/96 the sector registered 38 percent growth over the previous year. This continuous growth is mainly due to expansion of smallholder production by 40 per cent.

2.3 Agricultural Institutions
The Ministry of Agriculture and Irrigation (MOAI) has the overall responsibility for development and administration of the agricultural sector. The Ministry has six technical departments: Agricultural Extension Services (DAES); Agricultural Research and Technical Services (DARTS); Animal Health and Industry (DAHI); Agricultural Land Resources and Conservation (DALRC); Department of Crops (DOC); and Department of Irrigation (DOI). In addition to these departments, the Ministry has a Planning Division which is responsible for the planning, executing, reviewing and monitoring and evaluation of development programs. The four departments of interest to the project are DAES, DOI, DOC and DARTS. The four departments together have a total of 2,200 Front Line Staff (FLS).

2.4 Agricultural Credit Institutions

2.4.1 The financial sector in Malawi consists of two main systems – namely the formal and informal credit services. Apart from the commercial banks, other development finance institutions (DFIs) are providing informal credit services to rural sector. The DFIs consist of Malawi Development Corporation (MDC), Industrial Development Fund (INDEFUND), the Small Enterprise Development Organization of Malawi (SEDOM), Malawi Mudzi Fund (MMF), Malawi Union of Savings and Credit Cooperatives Limited (MUSCCO) and the Post Office Savings Bank (POSB).

2.5 The Marketing of Horticultural Crops

2.5.1 On the whole the potential for horticultural production still remains under developed despite the country's comparative advantage in producing most horticultural crops demanded in the international market. The marketing of horticultural crops is divided between the export and domestic markets. The export market is almost exclusively exploited by the large-scale commercial horticultural and cooperative estates. The domestic market is of more importance to smallholder horticulture. It consists of supermarkets and institutional buyers. Transactions are conducted through contracts with respect to quality, quantity and price. Prices offered on the average are higher in these markets and are less volatile. Most of the produce of the smallholder farmers which enter the domestic market is characterized by low quality, ungraded and unpacked produce. Since most of the value-added activities are not undertaken by the smallholders, they get low prices for their produce. If such value-added activities are done by the smallholders, it could enhance the marketability of their produce and consequently fetch higher prices to increase their income.

2.5.2 The Agricultural Development Marketing Cooperation (ADMARC) from 1987 ceased to be the sole buyer of food and horticultural crops. However, it still intervenes in the marketing of maize which is the staple food of the country. Its withdrawal from the marketing of horticultural crops, especially fruits, has demotivated smallholders from growing those crops.

2.6 Government Policy in the Agriculture Sector

The Government's medium and long-term objective for the agricultural sector aims at raising farm incomes and promoting economic growth while conserving natural resources; improving food self-sufficiency as well as the nutritional status of the population; and expanding
and diversifying crop and livestock production for local and export markets. The major strategies employed by the GOM to facilitate the realizations of these objectives focus on policy reforms and generation and dissemination of appropriate technology. The Agricultural and Livestock Development Strategy and Action Plan (ALDSAP), which was prepared in 1995, emphasizes rural poverty alleviation and constitutes the basis on which the priority areas for investment under (MASIP) will be pursued. ALDSAP is determined to accelerate broad-based agricultural and rural development as a major element of its struggle against poverty. The government has made serious efforts since 1987 to implement structural and sectoral adjustment measures to remove the barriers to enhance rapid growth and development of the agricultural sector. The impact of policy reforms on agriculture performance has been remarkably satisfactory, growth rate since 1993/94 ranging from 29.7% to 38%.

2.7 Land Tenure and Land Use

2.7.1 Land Tenure: The land tenure system has three categories namely: Public Land, Customary Land and Private Land. Customary land is vested in the President who, under the Chiefs Act, delegates power to allocate land to traditional Chiefs for use by smallholder sector. Private land is owned by individuals either under freehold or leasehold title, while public land is used by the Government for developing public institutions such as towns and markets or set aside for national parks and forest reserves. It is estimated that 6.6 million ha are customary land, 1.25 million ha are private land and 1.7 million ha has been set aside as public land to be used for forest or game reserves.

2.7.2 Following the liberalization of the Malawi Land Act of 1971, smallholder farmers, in principle, can apply to register customary land, to which they hold usufruct rights by authority of the village headman, as leasehold. Leaseholds are for 21 years at the first option. Extension of the leasehold for 99 years is possible once the necessary formalities of survey and registration are completed. Customary landholders, in general, appear satisfied with this system of land allocation and security. The land tenure system currently in place will not affect the project beneficiaries.

2.8 Poverty and Agriculture

Malawi is one of the poorest countries in the world. As per the 1996 UNDP Human Development Index on the basis of per capita, GDP, life expectancy and education, Malawi was ranked number 157 out of 174 countries. About 60% of the population is below the poverty line. A study prepared in 1996 by the World Food Programme (WFP), USAID and GOM on Vulnerability Assessment and Mapping (VAM) revealed that in Malawi, rural per capita income is estimated at US$ 66.00 per annum with the poorest area being as low as US$ 35.00 per annum. This is exacerbated by poor living conditions due to high unemployment rates, declining incomes, limited access to sanitation and health, high illiteracy rates and food insecurity. Poverty is prevalent in all regions in Malawi however, in terms of distribution, it is more pronounced in the northern and central regions. The project design will take into consideration these limitations to remove the constraints related to unemployment, incremental production, processing, storage and marketing.

2.9 Gender Issues
The ratio of female farm holders to male farm holders varies from region to region, however, female comprise about 60% of all smallholder farmers. Their farm sizes range from 2.6 ha to less than 0.5 ha for female-headed households who account for 40% of households. On the average women's holdings tend to be smaller than that of men and traditionally, women have less access to land. Furthermore, the dependency ratio in female-headed households is very high combined with lack of financial resources and inadequate extension support, prevent these households from breaking free from the cycle of low-input low-out farming. Apart from crop production, women are also involved in raising of cattle, layers and broilers. Other off-farm activities performed by women include post harvest activities such as food processing while men are involved in brick making and cottage enterprises.

2.10 Health and Nutrition

2.10.1 In general, the main diseases diagnosed among the population in the project area are malnutrition, malaria, measles, diarrhea and anemia. However, AIDs in recent years has aggravated the already poor health situation. It is estimated that about 20% of the population might be HIV positive.

2.10.2 The nutritional status in the project area is affected by seasonal factors. Children with higher underweight rates are observed during the rainy season than the dry season as the rainy season coincides with high incidence of diseases such as malaria and diarrhea in addition to low levels of staple in stock. Undernutrition and micro-nutrient deficiencies especially iodine, vitamin and iron are prevalent among the rural population.

2.11 Constraints to Agriculture Development

2.11.1 Erratic rainfall patterns and recurrent droughts remain the most unpredictable constraint facing the sector. Furthermore, smallholders do not have adequate incentives and support to produce surpluses apart from what they require for subsistence. Other constraints inherent to the sector include, poor and declining productivity on the dryland, lack of capital to purchase inputs and farm implements, lack of marketing channels and marketing information systems preventing smallholders from being competitive, inadequate extension advise, inadequate supply of seeds of improved varieties, high cost of inputs and inadequate village-level storage and processing facilities. In addition, pest and diseases especially during the rainy season represent a constraint to crop development. The proposed project is designed to support Government's effort to alleviate some of these constraints.

3. THE IRRIGATION, HORTICULTURE-AND FOOD CROPS SUB-SECTORS

3.1 Main Features

A) Irrigation Sub-Sector:

3.1.1 Malawi is served with both surface and ground water resources. It is drained by the two river systems of Lake Malawi - Shire and Lake Chilwa - Ruvuma. The weathered basement of
the plateau and the alluvial aquifers of the lakeshore and the Shire Valley serve as storage facilities for groundwater for the country. Of all these sources of water, shallow groundwater plays an important role in the development of small-scale irrigation. Annual run-off averages 16.14 billion m³, out of which only 7% is utilized for irrigation.

3.1.2 Rainfall occurs from October to April. Precipitation varies from 1800 mm in the highlands plateau and mountains to less than 800 mm in the rift valley areas. More than 90% of the run-off occurs during the rainy season renewing about 30 cubic kilometers of Malawi’s fresh water resources annually. Lake Malawi has an average live storage of 90 cubic kilometers which drains to the Shire River. Its total storage is 1,000 cubic kilometers. However, in spite of this quantity of water, Malawi often experiences periods of drought and low rainfall.

3.1.3 Water Quality: There has not been any significant pollution of water both surface and ground from possible pollutants. Therefore, the quality of water to date is reasonably good except for contamination with some water borne diseases.

3.1.4 Irrigation Experiences: Irrigation development started in Malawi in 1949 at Limphasa. In mid 1950s, two more schemes were developed on the Chilwa/Phalombe plain and an irrigated crop research station was established at Maganga. The largest irrigation scheme is owned by the Sugar Company of Malawi (SUCOMA). It came into production in 1965 and has reached its full development of 9,200 ha of sugarcane. This was followed by the second largest estate of 6,000 ha sugarcane, at Dwangwa in 1979. Major cash crops such as tea, coffee, tobacco, macadamia and rice are produced under irrigation. Irrigation farming is going on in about 22,000 ha out of an irrigation potential of about 101,100 ha.

B) Horticultural and Food Crops Sub-Sector:

3.1.5 Malawi has a strong economic comparative advantage in many horticultural crops especially fruits and vegetables. The cost of farm labour is very cheap, cost of production is cheap since several earth dams already exist and trebble pumps are produced locally. However this potential is under utilized. During the last decade, horticulture sector has developed slowly and has recently become one of the sub-sectors with an increasing foreign exchange earner. The wide range of climatic conditions and soil types enable the production of fruits trees including cashew nuts, macadamia, peaches, apples and plums to be grown in Malawi. High valued horticultural and food crops such as chillies, paprika, macadamia, cashew nut, cut flowers and spices offer small and large scale commercial producers an opportunity to expand into a highly lucrative export market replacing tobacco as the major foreign exchange earner in Malawi.

3.1.6 Malawi has two types of farming systems namely: upland- and floodplain. Upland farming relies mainly on rainfall, while floodplain farming depends on residual moisture from shallow wells and irrigation from stream diversions. The sub-sector is dominated by smallholder farmers who produce a wide variety of horticultural and food crops. The area allocated to horticultural growing in relation to other crops is estimated to be 10%. The main horticultural crops in addition to those mentioned in para 3.1.5 above, include oranges, tangerines, lemons, bananas, pineapples, mangoes, guavas, pawpaws and vegetables such as cabbage, tomato, onion, mustard, pumpkin and beans. The demand for horticultural and food crops exceeds the supply and the shortfall is met with imports. The worst negative agricultural trade balance is in
commodities such Irish potatoes, beans, sweet potatoes, cabbages tomatoes and pigeonpea. Most of these crops will be promoted under the project to improve the economic comparative advantage of Malawi in vegetable crops.

3.2 Government Policy in the two Sub-Sectors

A) Irrigation Sub-Sector:

3.2.1 The overall objective of the National Irrigation Policy and Development Strategy (NIPADS) of 1996 is to promote social and economic development through sustainable irrigated agriculture. NIPADS aims at projects that are economically and financially justified, socially acceptable and technically sound without causing unacceptable impact on the environment. NIPADS also ensures that irrigation development programmes benefit as many households as possible and in particular those that belong to the most vulnerable groups of the rural community.

3.2.2 The policy for financing irrigation development is that it occurs within minimum government subsidy and that all operations, maintenance and replacement costs are to be borne by the beneficiaries of irrigation schemes. The government encourages the application of cost sharing approach for capital costs of irrigation development, taking into consideration the farmer's ability to pay. The strategy for financing irrigation development promotes in-kind contributions from beneficiaries and credit availability by promoting financial institutions to recycle savings and invest in irrigated agriculture production, which will help enhance productivity of smallholder farmers.

B) Horticultural Sub-Sector:

3.2.3 The objectives of the sub-sector are inter alia, to encourage farmers to grow fruits of high quality for local and export consumption and to process and/or preserve the surplus; to increase the production of vegetables to meet domestic and to a limited extend the export demand while improving the nutritional status of the rural and urban population and to promote the growing of tree nut crops in all suitable areas in order to widen the economic base of the smallholder farmers and to provide raw materials for confectionery and other industrial uses. The horticultural section of the Department of Crops has not receive adequate support for its activities this has lead to the absence of a coherent and focused horticultural policy in the country.

3.3 Donor Support Activities

3.3.1 A total of nine (9) projects are currently being supported by a number of multilateral and bilateral donors and GOM to assist in developing the irrigation sub-sector. These include the Small-Scale Irrigation Project funded by IFAD. A grant aid of MK 20 million has been committed by the German Government through GTZ for institutional strengthening of the Department of Irrigation and development of smallholder irrigation schemes. The Shire Valley Pilot smallholder Irrigation Scheme is being financed by the French Government; project financing is reported at US$ 1.25 million. The Government of the Republic of China has donated 200 pumps for irrigation development. An estimated US$ 15 million has been provided
by Government of Japan through Japan International Co-operation Agency (JICA) to finance the design and construction of an 800 ha irrigation scheme in Bwanje Valley (Salima ADD).

3.3.2. The European Union (EU) under its Stabilization of Exports Programme (STABEX) funding is financing the construction of 10 self-help irrigation schemes in the Blantyre, Machinga and Mzuzu ADDs. The Danish International Development Agency (DANIDA) is providing support for finalizing Irrigation Policy, institutional assessment and studies of dam and dambo potential for a total US$ 1.3 million. Other irrigation projects being financed by the Government of Malawi include the construction of Irrigation Boreholes; Smallholder Irrigation Schemes Rehabilitation Project; Development of Sprinkler Irrigation Schemes Project and Replacement of Irrigation Pumps. The Chinese Agricultural Mission, the Japanese International Cooperation Agency (JICA), the USAID and The German Development Aid (GTZ) are the main donors involved in horticulture development. The ADB Smallholder Irrigation Development Project (ShIP) was appraised in May 1998 and is scheduled for board presentation in November 1998. Under the irrigation sub-sector all donor activities are coordinated by the Irrigation Task Force of the MOAI.

3.3.3 The proposed activities of the Horticultural and Food Crops Development Project will not duplicate the activities of on-going horticultural projects, but it will rather complement horticultural and food crops development activities especially in the selected project area which has not benefitted from related developmental and poverty alleviation activities.

3.4 Project Area

3.4.1 The Horticulture and Food Crops Development Project will cover four Agricultural Development Divisions (ADDs): Kasungu, Lilongwe, Mzuzu, and Salima in the north and center regions of the country. About 3,400 ha scattered in 27 Extension Planning Areas (EPAs) will be covered by the irrigation technologies and facilities under the project. Farmers in the project area have customary tenure thus security of the land in the project is not threatened. Selected project ADDs are shown in the country map and attached table of Annex 1A and 1B.

3.4.2 The principles governing the selection of the project sites were: i) technical and environmental criteria laid down by GOM; ii) irrigation potentiality; iii) availability of and access to market outlets; iv) consideration of areas with high incidence of poverty; iv) coordination and survey of similar irrigation activities being implemented and/or proposed by donor community as discussed in para. 3.3 above; v) conformity with the basic principles of the Malawi Agriculture Sector Investment Programme (MASIP) and vi) interventions that match local capacity for implementation.

3.5 Climate, Topography, Soils and Vegetation

3.5.1 The project areas have two defined seasons. The dry season which starts from May and ends in October and the wet season which covers the months of November to April. These climatic conditions are influenced by air pressure belts in the Inter-Tropical Convergence Zone. Rainfall is unimodal and is higher in the hilly areas; it ranges from 738 mm to over 1000 mm per year.
3.5.2 The terrain of the project area is gently undulating with an average slope of less than one percent. In the Rift Valley and the High-Altitude Plateaux, the altitude ranges from 200 meters above mean sea level to 3,000 meters in the highlands. Soils are mainly fertile alluvial deposits from the Shire River and terraces lying on the bed rock of the Rift Valley. The vegetation in the project area consists mainly of fertile lowland savanna with remnants of forests or thickets.

3.6 Project Beneficiaries

It is estimated that a total of 8,500 farm families will benefit from the project. Farmers, women and the youth will benefit directly from the project's activities. These farm families are among those below the poverty line (para 2.8.1). Subsistence smallholder farmers identified in the project area and have expressed their willingness to participate in the project will be targeted. Farmer Clubs (FCs) exist and they are eager to participate in the project. For sustainability, the project will upgrade and utilize existing FCs, but where they do not exist, FCs will be organized by NGO's and the Women Section of the MOAI to participate in the project.

3.7 Environmental Aspects

3.7.1 Some of the most pressing environmental problems that have been identified in the National Environmental Action Plan of Malawi include soil erosion, deforestation, water resources degradation, threat to natural resources and biodiversity, and human habitat degradation. On-site investigations and discussions with authorities concerned has helped to identify the key environmental receptors likely to be impacted by the project. They include: (a) the aquifers, which are presumably very important in the project area, but whose true potential has not yet been fully investigated; (b) the soils, which can be easily impoverished as a result of poor irrigation and management practices; (c) the rivers, whose water quality can be impaired; and (d) Lake Malawi, which constitutes the ultimate receptor of all impacts generated in its watershed.

3.7.2 Due consideration has also been given to the heterogeneity of the project sites. In fact, the total project area of 7500 hectares is distributed over a number of sites varying in area from 10 to 3000 hectares. Four types of sites can be distinguished: (a) the general flood plains, fairly large in area, and liable to occasional flooding; (b) the smaller sites that are part of the floodway and the flood fringes and generally subject to annual flooding; (c) the lake shore sites, strewn along the shores of Lake Malawi; they are fairly large in area and constitute potentially good agricultural land; however, some of these sites may be part of “Conservation Areas” as defined in the National Physical Development Plan of Malawi and therefore subject to special consideration.

4. THE PROJECT

4.1 Sector and Project Objective

4.1.1 The sector goal is to improve the well being of Malawians through poverty alleviation, especially among rural people, by promoting broad based and accelerated agricultural development.
4.1.2 The specific objective is to contribute to food security by increasing agriculture productivity and farm income of the smallholder target group through better access to smallscale irrigation, horticulture and marketing development.

4.2 Description of Project Outputs

4.2.1 The project design has five main components. These are: i) Capacity Building in irrigation technology, horticulture and research; ii) Establishment of a Credit System; iii) Establishment of Small-Scale Irrigation Schemes and rehabilitation of earth dams; iv) Establishment of a Marketing Structure for horticulture and food crops; and v) Project Management.

4.2.2 Through the Capacity Building component, a total of 644 trainees: 166 Front Line Staff (FLS), 370 Farmer Groups Leaders (FGLs), and 108 Subject Matter Specialists (SMS) will be trained during first two years in short and long-term regional and overseas training as well as field study tours in irrigation and horticulture technology, marketing, credit, environment and water use management. Under Marketing, 4 warehouse depots, 25 collection centers and 5 horticultural Marketing Boards (MBs) will be established. Under the Credit component, 350 Farmer Clubs, 15 savings and credit unions to be managed by the community will be established. For irrigation, a total of 395 ha will be irrigated by treadle pumps; 1,398 ha by small-motorized pumps, 1,590 ha will be under canal construction and gravity-fed irrigation.

There will be a total incremental crop production of 46,700 tonnes of the crops being proposed under project which include maize, sweet potatoes, tomatoes, cabbage; paprika, chillies, carrots and onions.

4.3 Detailed Description of Project Components and Activities

(A) Capacity Building

4.3.1 To ensure sustainable irrigation and horticultural development both in the selected project area and at national level, the project will strengthen the capacity of MOAI in irrigation, horticultural and marketing technologies and related areas as well as strengthen the capacity at the grass root level through a sustainable training programme. This will be achieved through building the capacity of the following relevant institutions:

4.3.2 Department of Irrigation (DOI): The project will build the capacity of DOI through training in irrigation technology, the provision of survey, soil water and water flow measuring equipment and office equipment for project related ADDs and RDPs. The project will provide local and overseas short-term training for DOI Staff, FLS and farmers’ group leaders (FGLs). The local training will be at the Natural Resources College (NRC) of MOAI. For the local training and field study tours, provision has been made under the project to train 80 irrigation Front Line Staff (FLS), 160 Farmer Group Leaders (FGLs) and 32 irrigation officers at Natural Resources College (NRC) of MOAI. Trained FLS, FGLs and irrigation officers will in turn train assistant officers and the project beneficiaries in related subjects. NRC will use the demonstration plots for irrigation and marketing already provided by the Smallholder Irrigation Project (ShIP) for the proposed training program. NRC will, in collaboration with Bunda College of Agriculture (BCA) and DOI, prepare the required training material for FLS and
FGLs. Training subjects will include irrigation practices, land leveling, crop water requirements, on-farm water distribution, excavation of dug wells, operation and maintenance of irrigation pumps, and earth dam design. The NRC will also train DOCP staff in the use of the field hydraulic equipment. In addition, six irrigation officers from the ADDs will be trained in irrigation and drainage technologies through the already existing training programme provided on an annual basis by Japanese International Cooperation Agency (JICA) to Malawi Government. MOAI will submit a list of staff to be trained by JICA. This will be retained as a loan condition.

4.3.3 To strengthen the extension capacity, provision has been made under the project to improve the management skills of the key project implementation and management staff through the Agricultural Management Training for Africa (AMTA) program.

4.3.4 Department of Crop Production (DOCP): The project will also build the capacity of crop production, seed distribution, and marketing through staff training in horticulture technology, marketing and extension; the provision of field tools and equipment; rehabilitation of four nurseries one at each ADD, and office equipment for project related ADDs and RDPs. The project will provide DOCP with local, regional and overseas training program. Provision has been made under the project, for the short-term training and field study tours, to train 80 extension Front Line Staff (FLS), 160 Farmer Group Leaders (FGLs) and 32 horticulture officers at Natural Resources College (NRC) of MOAI. NRC will, in collaboration with BCA and DOCP, prepare training material for FLS, FGLs, DOCP and MOAI staff. Furthermore, provision for regional training has been made to train 12 senior officers from the ADD levels in horticulture extension, crop storage and food processing, marketing and market information systems, and foreign trade development. In addition, 14 senior officers from the ADDs will be trained through JICA in vegetable cultivation techniques, agricultural cooperatives, and extension services for farmer leaders. The Women Programme Section (WPS) of MOAI will also conduct training workshops for project FLS and project beneficiaries.

4.3.5 Department of Agriculture Research and Technical Services (DARTS): Technical and managerial capacity of DARTS will be strengthened through rehabilitation of nurseries at research stations at the ADD levels as well as agro-forestry practices. Lack of seeds, planting materials for fruit trees, soil erosion and degradation as well as deforestation in the project areas will be mitigated through support for seed multiplication units, establishment of fruit tree nurseries and agro-forestry practices. In this connection, funds will be provided to support Chitedze and Mkondezi research activities for seed multiplication of horticultural, food crops and for selected multipurpose leguminous trees and shrubs to reduce soil degradation, improve crop yields and supply fodder and fuel wood for livestock and household fuel respectively. These planting materials and improved seeds will be provided to project beneficiaries at cost.

4.3.6 Farmer Groups: Project beneficiaries will receive training through residential and inter-district study torus. They will further receive training in horticulture and irrigation technology, crop grading, packaging and marketing of horticultural and food crops at NRC. One minibus per ADD will be provided to facilitate transportation of farmers to the training centers. Project participants will also be trained in water use and management, soil fertility and environmental management techniques. The project will recruit a TA specialized in Participatory Rural Appraisal to train FLS and farmer groups.
(B) Establishment of Micro-Finance Credit System

4.3.7 Under the project, credit will be provided to established farmer, women and youth groups. The project will utilize the support already provided by the ShIP project through the ADF Micro-finance Initiative for Africa (AMINA) to build the capacity of Micro-Finance Intermediaries (MFIs) and credit oriented NGOs in Malawi. The major project sub-components (credit, marketing and irrigation) will be implemented through short-listing of the NGOs which will be selected by AMINA programme. The project will contract one MFI and two NGOs to implement the project in collaboration with Project Management Office (PMO). While the MFI will administer and manage the credit funds, the two NGOs will organize and train farmers to access the credit facility to implement both irrigation and marketing components.

4.3.8 To meet the demand for credit, UA 2.6 million will be available for credit. The funds will be channelled through the National Bank of Malawi (NBM) to the financial intermediary (MFI) for on-lending to project beneficiaries. A portion of the credit fund will be available to DOI to purchase and examine the irrigation equipment to be handed over to the MFI. As a starting point, an awareness campaign will be undertaken by two NGOs in collaboration with the FLS and WFS. Trained FLS of DOI and DOCP, in collaboration with NGO's staff will in turn organize, support and train the project target group in group formation and dynamics, as well as credit and water use management. Using the PRA approach, participating farmers will determine their needs for irrigation development taking into consideration the source of water, and land terrain. Based on the result of PRA, farmers will be registered as small (Fcs) for credit. It is estimated that a total of 8,500 beneficiary farmers in the selected 25 EPAs will be organized into 350 legally registered Fcs.

4.3.9 To avoid non-payment of credit fund by farmers, MFI will be introduced to farmers as a separate credit entity. The Fcs will be organized into larger groups to establish 12 Saving and Credit Community-Based (self-owned) Unions (SCCBUs) to access the credit line and where necessary into Water Association Bond (WAB) for mutual concern in water management for large irrigation schemes. For sustainability of the credit system at the community levels, the selected MFI will upgrade and utilize existing SCCBUs, but where they do not exist, assist in establishing new ones. The formation of groups will facilitate farmers' access to credit and also provide group security and liability. Farmers will be invited to complete an application form and pay an affordable entrance fee to confirm their membership to participate and develop sense of ownership. Participating farmers will be encouraged to save with SCCBU and buy shares on a regular basis until they have acquired the minimum shares, to be agreed upon by union members, to be a full member. Next, members of SCCBU will open a deposit account. Shareholders will share dividends at the end of the year and profit market interest rate for their deposits. A legal ownership of SCCBU will be transferred to beneficiary members of the community. Beneficiaries, who are full members in SCCBU, will elect one representative and decide on how the system will be managed. Members will agree on an operation and maintenance fee to be collected by their representative for the recurrent cost of operating fuel and maintenance of the irrigation systems. An operator to be elected by project beneficiaries, will be fully trained and supervised by FLS.

4.3.10 The MFI will provide the necessary backstopping and will be responsible for credit
administration and management including group assessment and credit recoveries. The credit line will be available for procurement of treadle and motorized pumps as well as food processing equipment. To promote private sector activities, farmers will have access to the credit facility to establish seed multiplication units, fruit tree nurseries, horticultural nurseries, fish farms, livestock production and to purchase oxen drawn carts and small trucks. Established youth groups and clubs will be eligible to access the credit line for construction of workshops for the maintenance and repairs of the irrigation pumps. Credit also will be provided for construction of village-level storage facilities. Beneficiary farmers will have access to credit to purchase farm inputs and any other project related income generating activity in addition to motorcycle/bicycle for FLS extensionists. Project beneficiaries will be required to repay the loan to the MFI through its Fcs or SCCBU or cooperatives within 12-18 months after receipt of the irrigation equipment. The MFI will ensure over 90% repayment rate for continued operations of credit facilities.

(C) Establishment of Small-Scale Irrigation Schemes

4.3.11 For the purpose of sustainability, the project is designed to establish simple irrigation practices. Selection of the appropriate irrigation technique is based on the location and source of water. Five irrigation patterns are proposed under the project to promote irrigated agriculture in the four ADDs selected for this project as follows:

4.3.12 Treadle pumps: Project beneficiary will be provided with treadle pumps on credit to serve an area of 0.3 hectare on average in areas with shallow ground-waters. Participating farmers will undertake the excavation of dug wells, construction of the wellhead protection, land preparation, and on-farm water distribution network on their respective plots. All participating farmers will be required to complete their farm preparation before receiving their pumps.

4.3.13 Small-motorized pumps for surface water: In schemes will perennial rivers, farmers groups will be provided with small-motorized on credit. One pump is expected to serve an area of 3 ha. Each scheme will be served by a main distribution canal that abstracts water directly from the rivers. Farmers will be responsible for the construction of the irrigation and drainage distribution systems. The main distribution canals will be served by a large motorized pump to lift water from the river, while the small farms will be served with small-motorized pumps. The tertiary canals, and infield drainage networks will be designed by consultant(s) and constructed by trained farmers to ensure sense of ownership.

4.3.14 Rehabilitation of 25 earth dams: A total of 25 earth dams will be rehabilitated for irrigation purposes. Some of these dams are heavily silted and some feeding streams are largely blocked with weeds. The spillways of some of the dams will also need rehabilitation. For downstream irrigation, tubewell will be relied on for irrigation. Motorized pumps will extract water from the tubewells to irrigate the areas downstream. The spillway ditches will be rehabilitated and lined by contractors and a network of field canals will be constructed by trained farmers to distribute water by gravity to irrigate farmers plots. Beneficiary farmers will be trained to participate in performing the necessary land preparation. Legal ownership of the rehabilitated dams will be transferred to the beneficiaries in the community who will assume the maintenance of the dams.
4.3.15 Establishment of sprinkler irrigation schemes: Sprinkler irrigation will be established at selected schemes with an area 15 hectares (e.g. Tembwe) using groundwater. Sprinkler irrigation is generally adaptable to many crops and soils. Beneficiaries will be trained to operate and maintain the sprinkler systems.

4.3.16 Small-motorized pumps for groundwater extraction in floodplain: In areas with vast floodplain, tubewells will be sunk for small-motorized pumps of 5 horse-power, to extract groundwater for irrigation. One pump will irrigate three hectares and will serve about 9 to 10 farmers. The tubewells will be constructed initially by contractors and eventually, farmers will be trained on how to construct these tubewells, the infield irrigation canals and drainage systems. No permanent distribution canals will be encouraged since such flood-plains are river channels which are subject to denudation during the rainy season. Annex 1B provides the details of the project area and the corresponding irrigation patterns.

(D) Establishment of Marketing Structure

4.3.17 The marketing of horticultural produce is central to improving farmers' income. The project will provide marketing depots and Collection Centers (CCs) in the project areas. Four Market depots to handle horticultural produce and food crops will be established, one in each ADD. The depots will have a wholesale market grading and packaging facilities, and a cold room that can store horticultural produce for a few days. CCs will be established, nearer to the producers. The project will provide materials for construction of the CCs. Members of FCs or SCCBU will select strategic locations and provide input for the construction of the CCs. Farmers groups will be provided with credit to purchase vehicles and ox-drawn carts to transport their produce to the collection centers or the main depots. Each market depot will be managed by a Local Marketing Board (LMB). Members of the LMB will be elected from the SCCBUs with representatives from planning and marketing division of MOAI, Ministry of Commerce and Export Promotion Council (MEPC).

4.3.18 A Central Marketing Board (CMB) will also be established in Lilongwe to coordinate the marketing activities locally, regionally and at international levels. The project will recruit an international Technical Assistance with expertise in marketing to serve as the manager for the marketing component. The TA will set up a marketing information intelligence system and will liaise with the MEPC to explore export market opportunities for project beneficiaries. To promote the private sector, marketing agents will be allocated marketing stands at the depots on rental basis. These agents will facilitate the linkage between producers and suppliers by purchasing the produce from farmers on whole sale basis or by growing on demand for export market. The Government will provide the land to be used for construction of marketing depots and collection centers in relevant EPAs of the project area. This will be retained as a loan condition.

4.3.19 Marketing and Food Processing Studies: A marketing study to explore regional marketing potentialities will be conducted immediately after loan effectiveness by a consultancy firm specialized in marketing studies. The consultancy firm will conduct in selected regional countries a baseline survey and marketing study to provide a marketing information system, regional export potentialities and provide a better assessment of the export problems and standard quality of horticultural produce. The study will assist the marketing office to set-up an
export strategy in the regional countries. In addition, a food processing study will also be conducted to determine appropriate small-scale food processing equipment which would be sufficient for the agricultural and food produce in order to support micro enterprises sub-sector in Malawi. The study will include market prices as well as technical and financial viability for different types of food processing equipment.

4.3.20 It is proposed that the management of the market will be tendered to the private sector after project year three on rental basis. The modalities of the management of the market depots will be agreed upon between the Government and private sector.

(E) Project Management

4.3.21 The project will be implemented within the existing institutional framework of the Ministry of Agriculture and Irrigation. The staff of DOI, DOCP will be trained in irrigation, horticulture, and management technology to implement the project at the ADD levels through TAF resources. A project management office will be established at Lilongwe and headed by a locally recruited manager who will be assisted by a qualified accountant and a manager assistant. A Technical Assistant, marketing expert, will be recruited to manage the marketing component. The TA will be assisted by two nationally recruited project counterparts. Two civil engineers, one horticulturist, one environmentalist and one PRA expert will be recruited. The civil engineers will initiate and supervise civil work activities related to the smallscale irrigation and marketing infrastructure. The environmental and PRA specialists will be recruited to supervise the training and extension activities. Other short term technical consultants will be required for the irrigation civil work.

4.4 Project Assumptions and Risks

4.4.1 The project design is based on some assumptions: 1) the credit facility for project beneficiaries will be at market interest rates. It has been assumed that the mechanism to be provided under the project for credit will ensure that the vulnerable groups, smallholders, women farmers and the youth will have access to credit. 2) the establishment of on-farm canals for water distribution, drainage and dam rehabilitation will be undertaken by project beneficiaries. The implementation of this simple civil work will be accomplished if farmers are responsive to provide labor for construction of on-farm canals in their respective fields. However, introducing FCs, SCCBU to be owned and managed by project beneficiaries with full and legal membership will confirm their participation and reduce this risk. 3) the non-availability of market outlets for farmers in the project is another shortcoming to the project. It has been assumed that the provision for construction of marketing depots and collection centers in the project area will overcome this constraint. 4) It is also assumed that the probability of draught will be low.

4.4.2 The inadequate administrative skills at DOI which is required for project management is a risk for the project implementation. The introduction of AMTA’s training programme for procurement, financial reporting and auditing of the project will strengthen the administrative capacity of DOI staff.
4.5 Project Cost

The total cost of the project including physical and price contingencies is estimated at UA 9.67 million (MK 343.47 million). The foreign exchange component is UA 5.75 million (MK 204.24 million) i.e. 59% of the total project cost. UA 3.92 million (MK 139.23 million) i.e. 41% of the total project cost will be in local currency. Physical contingencies have been applied to all civil works at 10% and for procurement of equipment and tools at 5%. Price contingencies have been applied to all cost items at an annual rate of 2.5% compounded, which is based on the most recent estimates of projected increases in the world community prices. Although, all prices were costed at local current prices, the world prices were used as the project cost is calculated in UA which will offset any possible future local inflation. Cost estimates by component summarized in Table 4.1 are based on prices prevailing and confirmed in September 1998. Project cost by category of expenditure is summarized in Table 4.2.

4.6 Sources of Finance

4.6.1 The financing plan of the project is summarized in table 4.3 below. The ADF loan of UA 6.23 million will finance 76% of the foreign exchange costs estimated at UA 4.34 million and part of the local costs amounting to UA 1.89 million i.e. 20% of the total project cost. The TAF will finance 13% of the total costs for institutional and technical capacity building which will include provision of training in irrigation and horticultural technologies and marketing techniques, consultants, technical assistance, studies as well as the provision of survey, soil water and water flow measuring equipment and office equipment. The Government will finance UA 1.00 million of the total project costs which will include Government staff salaries, rental cost for the PMO offices, the land and design works for construction of market depots and salaries of some off-campus professors who will teach at NRC periodically. The project beneficiaries will contribute about 6.3% of the total project cost by providing labour work for construction of on-farm irrigation canals and digging boreholes for treadle pumps. Their total contribution will amount to UA 0.60 million. The MOAI staff will benefit from the already existing JICA’s training program in terms of

| Table 4.1 |

Summary of Project Cost Estimates by Component

<table>
<thead>
<tr>
<th>Components</th>
<th>(In MK Million)</th>
<th>(In UA Million)</th>
<th>% F.E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Foreign Exchange</td>
<td>Local Costs</td>
<td>Total Costs</td>
</tr>
<tr>
<td>A. Capacity Building and Training</td>
<td>45.82</td>
<td>17.40</td>
<td>63.22</td>
</tr>
<tr>
<td>B. Rural Micro-Finance System</td>
<td>57.19</td>
<td>24.15</td>
<td>81.34</td>
</tr>
<tr>
<td>C. Small-Scale Irrigation Schemes</td>
<td>40.49</td>
<td>36.23</td>
<td>76.72</td>
</tr>
<tr>
<td>D. Estab. of a Marketing Structure</td>
<td>28.06</td>
<td>17.40</td>
<td>45.46</td>
</tr>
<tr>
<td>E. Project Management</td>
<td>10.66</td>
<td>29.13</td>
<td>39.79</td>
</tr>
<tr>
<td>Total Base Cost</td>
<td>182.22</td>
<td>124.31</td>
<td>306.53</td>
</tr>
<tr>
<td>Physical Contingency</td>
<td>10.30</td>
<td>6.75</td>
<td>17.05</td>
</tr>
<tr>
<td>Price Contingency</td>
<td>11.72</td>
<td>8.17</td>
<td>19.89</td>
</tr>
</tbody>
</table>
Table 4.2

Summary of Project Cost by Category of Expenditure

<table>
<thead>
<tr>
<th>Category of Expenditure</th>
<th>(In MK Million)</th>
<th>(In UA Million)</th>
<th>% F.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Foreign Exchange</td>
<td>Local Costs</td>
<td>Total Costs</td>
</tr>
<tr>
<td>1. Goods and Equipment</td>
<td>19.89</td>
<td>4.26</td>
<td>24.15</td>
</tr>
<tr>
<td>2. Credit for Goods &amp; Equipment</td>
<td>46.53</td>
<td>10.30</td>
<td>56.83</td>
</tr>
<tr>
<td>3. Civil Works</td>
<td>46.53</td>
<td>17.05</td>
<td>63.58</td>
</tr>
<tr>
<td>4. Training and Studies</td>
<td>13.85</td>
<td>9.23</td>
<td>23.08</td>
</tr>
<tr>
<td>5. Technical Assistance (Local)</td>
<td>0.00</td>
<td>4.62</td>
<td>4.62</td>
</tr>
<tr>
<td>6. TA &amp; Consultancy Services (Int’l)</td>
<td>22.73</td>
<td>0.00</td>
<td>22.73</td>
</tr>
<tr>
<td>7. Farm Inputs and Local Material</td>
<td>10.66</td>
<td>18.11</td>
<td>28.77</td>
</tr>
<tr>
<td>8. Operation &amp; Maintenance</td>
<td>22.03</td>
<td>9.59</td>
<td>31.62</td>
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<tr>
<td>9. Government</td>
<td>0.00</td>
<td>31.97</td>
<td>31.97</td>
</tr>
<tr>
<td>10. Beneficiaries</td>
<td>0.00</td>
<td>19.18</td>
<td>19.18</td>
</tr>
<tr>
<td><strong>Total Base Cost</strong></td>
<td>182.22</td>
<td>124.31</td>
<td>306.53</td>
</tr>
<tr>
<td><strong>Physical Contingency</strong></td>
<td>10.30</td>
<td>6.75</td>
<td>17.05</td>
</tr>
<tr>
<td><strong>Price Contingency</strong></td>
<td>11.72</td>
<td>8.17</td>
<td>19.89</td>
</tr>
<tr>
<td><strong>Total Project Cost</strong></td>
<td>204.24</td>
<td>139.23</td>
<td>343.47</td>
</tr>
</tbody>
</table>

overseas training and volunteers technical assistance through the Government channels. The total cost of this training is UA 0.58 million. Submission of a training request to JICA will be retained as a loan condition.

4.6.2 The contribution of ADF resources to the financing of local costs is justified by the fact that the country’s economy has suffered setbacks as a result of recurrent droughts during parts of 1980s and 1990s. The Government is not in a position to mobilize adequate local resources to meet the developmental resource needs. However, Government is making efforts to revitalize the economy through a series of economic reforms. This is confirmed by the fact that Malawi has remained committed to the implementation of the macroeconomic and structural reforms initiated since the 1980s. As a result of successful implementation of these programmes, the Government reached an agreement with the IMF for an Enhanced Structural Adjustment Facility in support of a medium-term reform programme covering the period 1996/97-1998/99. The external assistance received is predominantly used for financing the foreign exchange cost. In addition, the nature of the project is such that a significant portion

Table 4.3

Sources of Finance (In UA Million)

<table>
<thead>
<tr>
<th>Source</th>
<th>Foreign Exchange</th>
<th>Local Costs</th>
<th>Total Costs</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF</td>
<td>4.34</td>
<td>1.89</td>
<td>6.23</td>
<td>64.4</td>
</tr>
<tr>
<td>TAF</td>
<td>0.83</td>
<td>0.43</td>
<td>1.26</td>
<td>13.0</td>
</tr>
<tr>
<td>Government</td>
<td>0.00</td>
<td>1.00</td>
<td>1.00</td>
<td>10.3</td>
</tr>
<tr>
<td>Beneficiaries</td>
<td>0.00</td>
<td>0.60</td>
<td>0.60</td>
<td>6.3</td>
</tr>
</tbody>
</table>
of requirements for its implementation - mainly training of extension staff, credit for simple irrigation equipment, simple civil works to be implemented by farmers, local materials for boreholes, construction of irrigation facilities and the treadle pumps can be procured locally.

4.7 Environmental Impacts

4.7.1 Like with any other human activity, irrigation schemes generate a number of impacts that need to be identified and mitigated to improve the sustainability of the project. Despite the large surface area involved, it has been determined that a full environmental impact assessment is not warranted in view of the low technology irrigation methods being employed, the rural focus and the experience already acquired in the design and management of such projects. However, in accordance with the Environmental Management Act in force in Malawi, a number of the sites identified for irrigation schemes are subject to mandatory Environmental Impact Assessment. As such, the project will be subjected to a full national EIA process, which will improve the project quality by establishing an adequate environmental baseline that will eventually help in the monitoring and management of the project.

4.7.2 An assessment of the potential impacts, their likelihood to impact and the consequences of such impacts on the environmental receptors, has determined a range of mitigation measures that need to be applied. These include the protection of the river reserves, the construction of retention ponds to trap upstream silt before the river enters the dam, the protection of dam and canal embankments with vegetation, the maintenance of a minimum flow of water in the perennial rivers to protect the breeding grounds of migrating fish, and a close monitoring of the application of chemical fertilizers and pesticides. A complete list of the mitigating measures is at Annex 2.

4.8 Impact on Women and Youth

4.8.1 Provision has been made under the project to address the training and resource requirements of both women and the youth. The Women’s Program Section (WPS) and the Extension Department of the MOAI, in collaboration with selected NGOs, will identify, train and assist women and youth groups to establish farmer clubs. The formation of groups will provide group security and facilitate beneficiaries’ access to the credit line under the project. It will also provide the vehicle for collective bargaining of input supplies while providing a focus point to facilitate training and transfer of research and extension messages to beneficiaries.

4.8.2 The project will also direct its efforts towards easing women’s labour constraints, a factor which affects the ability of women to cultivate effectively, by providing credit for small farm implements for land preparation and ploughing. To promote private sector initiatives, the credit component will be made available for both individual and group activities. Individual women will have access to the credit funds to purchase and market agricultural produce from the project and for purchase food processors such as solar dryers, rampresses, maize and rice mills and groundnut crushers. Further, credit will be provided to established youth groups for the construction of workshops and purchase of some spare parts for maintenance and repairs of treadle and motorized pumps and sprinkler irrigation systems. These activities will enhance the
employment and income status of the project beneficiaries, especially women and the youth.

4.9 Impact on Poverty Reduction

4.9.1 The proposed project activities will complement the Government's objectives to increase the productivity on flood plains by increasing access to water for horticultural and food crops production for smallholder dryland farmers, mostly women who account for about 60% of the poorest of smallholders. The project will also assist in limiting and/or removing the constraints related to increased productivity, credit, food processing, storage facilities and marketing of horticultural and food crops surplus. In addition, the non-participant poor in the project area will also benefit indirectly from generation of project related employment as a result of increased agricultural production. The activities to be implemented under the project will have a positive impact and thereby reduce poverty in the project area.

5. PROJECT IMPLEMENTATION

5.1 Executing Agency

The Ministry of Agriculture and Irrigation (MOAI) will be the Executing Agency (EA). The MOAI is headed by a Minister. The Principal Secretary is the administrative head and the Accountant General. In this capacity he coordinates the overall day to day activities of the Ministry. The Controller of Agricultural Services is the technical head of the Ministry and has the overall responsibility for the implementation of agricultural projects and programmes in Malawi. The MOAI is divided into six departments; Agricultural Research, Agricultural Extension and Training, Animal Health and Industry, Irrigation and Land Resource and Conservation. There is also a department of Finance, Administration and Personnel. The Food and Nutrition unit deals with policies relating to food and nutrition and early warning complex.

5.2 Organization and Management

The project's headquarters will be located within the irrigation department of the MOAI in Lilongwe in order to ensure effective coordination and timely implementation of the project. The Project Management Office (PMO) will be headed by a project manager (PM), who will report to the controller of irrigation. Project Manager will liaise with related departments of MOAI including NRC, selected NGOs and MFI to coordinate project implementation. At the ADD levels the M&E officers, in collaboration with the horticulture and irrigation officers, will coordinate the project activities and report to the PM through the programme managers of their respective ADDs. The PM will be assisted by a qualified accountant. The marketing component will be managed by an internationally qualified marketing expert who will be assisted by two local assistants. Furthermore, the PMO will be supported technically by two civil engineers, one horticulturalist, one environmentalist and one PRA expert. All the extension, FLS and SMS staff will be existing staff of DOI, DOCP, WPS of the MOAI. The support staff will include one secretary and two drivers. The office space for the PMO will be provided by the Government. The establishment of the PMO at Lilongwe as well as the qualifications and experience of staff for PMO should be acceptable to the Fund. These will be retained as a loan condition.
5.3 Disbursement

5.3.1 The Government will open a foreign exchange denominated account with the Reserve Bank of Malawi in the name of the project. An operating/special account denominated in Kwacha, will be opened at the National Bank of Malawi (NBM) which has branches in the project areas. Funds for the credit component will be held in the Lilongwe account to facilitate drawing of funds by the financial intermediary and also facilitate monitoring of the credit funds by the PM. Funds for credit activities will be drawn by the financial intermediary upon submission to the commercial bank, of a list of beneficiaries, the intended activities and corresponding amount required.

5.3.2 The accounts in the 4 ADDs - Mzuzu, Kasungu, Salima, and Lilongwe will be replenished on a quarterly basis by transfer of funds from the foreign exchange account converted into Kwacha at the prevailing exchange rate. Larger procurement will be paid for by direct method of payment. The signatories of the account in Lilongwe will be the Project Manager and the Project Accountant. At the ADD levels, the signatories will be the ADDs Programme Managers, the Irrigation Officer in charge of the relevant ADDs and the Horticulture Specialist attached to the ADD.

5.4 Credit Administration

5.4.1 Provision is made under the project to allocate about 2.6 million for the credit component. A Micro-Finance Intermediary (MFI) with agencies in the project area will be recruited to administer and manage the credit facility. Two NGOs will also be recruited for formation of farmer groups, group dynamics and training of farmers for credit. In collaboration with the MFI, the NGOs will select after training, eligible farmer groups to access the credit fund. In this connection, all the irrigation equipment will be purchased by the DOI and handed over to the MFI. Beneficiary farmers eligible to access the credit line will be supplied with the irrigation equipment through the MFI.

5.4.3 The credit facility will be extended to established farmer and youth as well as eligible individual project beneficiaries. Credit will be provided for seasonal and medium term investments, including seasonal inputs, treadle and motorized pumps, sprinkler systems, establishment of seed multiplication units and fruit nurseries, construction of workshops for repairs and maintenance of irrigation pumps, small farm implements, marketing of agricultural produce, food processors and any other project related income generating activities.

5.4.4 The loan recovery will be ensured by the MFI and its field staff who have a direct interface with the beneficiaries in the community. The loan recovery will also be ensured by project beneficiaries themselves through peer pressure and group liability. In this type of credit and savings set up, the beneficiaries themselves are the owners of the credit and savings cooperative. They will therefore ensure that members repay their loans to avoid being penalized for future credit.
5.5 Procurement of Goods, Works and Services

5.5.1 Procurement arrangements are summarized in Table 5.1 below. All procurement of goods, works and acquisition of consulting services financed by the Bank will be in accordance with the Bank’s Rules of Procedure for Procurement of Goods and Works or, as appropriate, Rules of Procedure for the Use of Consultants, using the relevant Bank Standard Bidding Documents.

5.5.2 Malawi’s national procurement laws and regulations have been reviewed and determined to be acceptable. The MOAI is the Executing Agency. It has a Procurement Unit staffed by qualified personnel. It is conversant with Fund procurement rules and procedures. In addition, they will be trained by AMTA program provided by the project. Further, the Bank Group will conduct a workshop in procurement and disbursement in December 1998.

5.5.3 Civil Works: Procurement of civil works for main irrigation canals, totaling in aggregate at UA 0.77 million will be carried out under International Competitive Bidding (ICB) procedures. Three of such contracts will be awarded one for each of the areas of Salima, Mzuzu and Kasungu ADDs. Procurement of civil works for the market depots valued about UA 0.18 million per contract will be carried out through ICB procedures. Four of such contracts will be awarded for the four ADDs: Lilongwe, Kasungu, Mzuzu, and Salima. Procurement of civil works for tubewells, dam rehabilitation, and drainage canals valued at less than UA 0.10 million per contract will be carried out under NCB procedures. Numerous contracts will be awarded and valued in aggregate at UA 0.19, 0.28, and 0.31 million for each locality respectively. The small values of the single contracts and as they are scattered around, the project will not attract international contractors. It should be noted that these values include the contribution of beneficiaries in the form of labor work in kind totaling UA 0.11, 0.08, and 0.07 million for each locality respectively. The beneficiaries will make their contributions after the civil works contractors have completed the work.

5.5.4 Goods: Contracts for vehicles and office equipment valued in aggregate at UA 0.68 million will be awarded under International Competitive Bidding (ICB) procedures. Due to their small value and that they are off-the-shelf items, the survey and soil and water flow measuring equipment valued at UA 0.06 million will be procured using NCB. The tools and local materials needed for small civil works (on-farm canals, irrigation dugwells and tubewells, and collection centers for village marketing) are different in type, quantity and usage; valued at UA 0.28 million will be procured through National Shopping (NS). Irrigation equipment valued UA 0.19 million will be procured through ICB. Small irrigation equipment totaling in aggregate UA 0.90 million will be procured using NCB. Marketing equipment valued UA 0.88 million will be procured using National Shopping (NS), as they are diversified and will be procured by the selected Non Governmental Organizations (NGOs). The list of qualified suppliers for small irrigation and marketing equipment will be subject to ADF approval. Credit for the purchase of farm inputs and production material valued UA 0.51 million will be granted to beneficiary farmers under the credit scheme. Provisional list of goods and services is shown in Annex 3.

5.5.5 Consulting and Training Services: Procurement of consulting services for civil work design, and short term consultants for studies as detailed in Table 5.1, will be undertaken in accordance with the Fund’s Rules of Procurement for the Use of Consultants, using the
Standard Request for Proposals. Procurement will be on the basis of a short list. For consulting firms, the selection procedures will be the combined technical quality with price consideration. The training component will be basically implemented by local irrigation specialists and university experts who will train the irrigation officers in the NRC and in turn the front line extension staff. Technical Assistance involves the use of local specialized agencies or NGOs working in Malawi, and their procurement will be on the basis of Short List. Audit services will also be procured through Short Listing.

5.5.6 General Procurement Notice: The text of General Procurement Notice (GPN) will be discussed and agreed upon with the Government of Malawi during negotiations. It will be issued for publication in Development Business, upon approval of the Loan Proposal by the Board of Directors.

5.5.7 Review Procedures: The following documents are subject to review and approval by the Bank before promulgation:

| Table 5.1 |
| Procurement Arrangements (In UA Million) |

<table>
<thead>
<tr>
<th>PROJECT ITEM</th>
<th>ICB</th>
<th>NCB</th>
<th>Non-Bank Funded</th>
<th>Others</th>
<th>Short List</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Civil Works</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rehabilitation of 25 Dams</td>
<td>0.28 (0.20)</td>
<td></td>
<td></td>
<td>0.28 (0.20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Establish of 431 Tubewells</td>
<td>0.19 (0.08)</td>
<td></td>
<td></td>
<td>0.19 (0.08)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drainage Canals (41.5 km)</td>
<td>0.31 (0.24)</td>
<td></td>
<td></td>
<td>0.31 (0.24)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Irrig. Canals (576 Km)</td>
<td>1.06 (0.77)</td>
<td></td>
<td></td>
<td>1.06 (0.77)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marketing Depots</td>
<td>0.80 (0.75)</td>
<td></td>
<td></td>
<td>0.80 (0.75)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Goods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicles &amp; Office Equip.</td>
<td>0.68 (0.68)</td>
<td>0.06 (0.06)</td>
<td></td>
<td>0.68 (0.68)</td>
<td>0.28 (0.28)</td>
<td></td>
</tr>
<tr>
<td>Survey/hydr./soil/field Equip.</td>
<td></td>
<td></td>
<td></td>
<td>0.06 (0.06)</td>
<td>0.28 (0.28)</td>
<td></td>
</tr>
<tr>
<td>Tools and Local Material</td>
<td></td>
<td></td>
<td></td>
<td>0.28 (0.28)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Credit, Irrig. &amp; Marketing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irrigation Equipment</td>
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<td></td>
<td></td>
<td>0.19 (0.19)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small Irrigation Equipment</td>
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<td></td>
<td></td>
<td>0.90 (0.90)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marketing Equipment</td>
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<td></td>
<td></td>
<td>0.88 (0.88)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farm Input/Prod. Material</td>
<td>0.51 (0.51)</td>
<td></td>
<td></td>
<td>0.51 (0.51)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Training and Studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training Studies</td>
<td>0.30 (0.00)</td>
<td>0.20 (0.20)</td>
<td></td>
<td>0.50 (0.20)</td>
<td>0.13 (0.13)</td>
<td></td>
</tr>
<tr>
<td>E. Consultancy Services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical Assistance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TA and Consultancy Services</td>
<td>0.48 (0.00)</td>
<td></td>
<td></td>
<td>0.71 (0.00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Oper. &amp; Maintenance Costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicles &amp; Office Equip.</td>
<td>0.37 (0.37)</td>
<td>0.66 (0.66)</td>
<td>0.14 (0.14)</td>
<td>0.37 (0.37)</td>
<td>0.66 (0.66)</td>
<td>0.14 (0.14)</td>
</tr>
<tr>
<td>NGO's Advance Payment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office Rental/Land Value</td>
<td>0.17 (0.00)</td>
<td></td>
<td></td>
<td></td>
<td>0.17 (0.00)</td>
<td></td>
</tr>
<tr>
<td>Gov. Staff Salaries</td>
<td>0.71 (0.00)</td>
<td></td>
<td></td>
<td></td>
<td>0.71 (0.00)</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>1.77 (1.77)</td>
<td>2.10 (2.10)</td>
<td>2.18 (0.00)</td>
<td>3.04 (3.04)</td>
<td>0.58 (0.58)</td>
<td>9.67 (7.49)</td>
</tr>
</tbody>
</table>

(1) Numbers between brackets are funded by ADF resources.
(2) "Others" include National Shopping Procedures.

- Specific Procurement Notices;
- Tender Documents/Request for Proposals;
- Tender Evaluation/Evaluation of Proposals Reports, including recommendations for contract awards;
- Draft Contracts if these have been amended from the drafts included in the tender invitation documents.

5.6 Implementation Plan and Expenditure Schedule

5.6.1 The project will be implemented over five-year period with 1999 being PY1. The PMO will be responsible for overall supervision and implementation of all components in collaboration with:

a) DOI of MOAI will implement the small-scale irrigation schemes component. Beneficiaries will participate in the construction of on-farm distribution canals, boreholes/ tubewells digging and head protection through the provision of local materials and free labour. Design of civil work including dam rehabilitation will be contracted to local consultants. Construction of the main distribution canals including market depots and rehabilitation of dams will be contracted out to local construction firms on the basis of National Competitive Bidding (NCB). The management of the four marketing depots will be tendered to the private sector by the end of project year 3 on rental basis; and

b) MOAI through its ADDs and RDPs will assign irrigation and horticultural officers to assist in the implementation of irrigation, horticultural, and marketing extension programme and train farmers for irrigation, horticultural practices. In addition, 16 irrigation and horticultural assistants and 4 M&E officers will be assigned at the ADD level. At the EPAs level, 200 FLS will be assigned to collaborate with the selected NGOs and the MFI for farmer groups formation and credit management. In collaboration with Irrigation Task Force committee (ITF), the Village Development Committees (VDCs) will be responsible for mobilizing the beneficiary community to provide free labour for the construction of the on-farm distribution canals;

5.6.2 The expenditure schedule by component and by source of finance over the project period is projected to be as shown in tables 5.2 and 5.3 above. The tentative implementation schedule is shown in Annex 4.

Table 5.2

<table>
<thead>
<tr>
<th>Components</th>
<th>FY1</th>
<th>FY2</th>
<th>FY3</th>
<th>FY4</th>
<th>FY5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Capacity Building and Training</td>
<td>0.96</td>
<td>0.40</td>
<td>0.27</td>
<td>0.27</td>
<td>0.06</td>
<td>1.96</td>
</tr>
<tr>
<td>B. Rural Micro-Finance System</td>
<td>0.39</td>
<td>0.49</td>
<td>0.64</td>
<td>0.66</td>
<td>0.42</td>
<td>2.60</td>
</tr>
<tr>
<td>C. Smallscale Irrigation Schemes</td>
<td>0.45</td>
<td>1.00</td>
<td>0.74</td>
<td>0.27</td>
<td>0.00</td>
<td>2.46</td>
</tr>
<tr>
<td>D. Estab. of Marketing Structure</td>
<td>0.72</td>
<td>0.53</td>
<td>0.14</td>
<td>0.00</td>
<td>0.00</td>
<td>1.39</td>
</tr>
<tr>
<td>E. Project Management Office</td>
<td>0.28</td>
<td>0.23</td>
<td>0.24</td>
<td>0.26</td>
<td>0.25</td>
<td>1.26</td>
</tr>
<tr>
<td><strong>GRAND TOTAL</strong></td>
<td>2.80</td>
<td>2.65</td>
<td>2.03</td>
<td>1.46</td>
<td>0.73</td>
<td>9.67</td>
</tr>
</tbody>
</table>
5.7 Monitoring and Evaluation

5.7.1 Monitoring and Evaluation of the project's activities including implementation progress and expenditure will be carried out as a regular management function. It will be performed by the Project Management Office. The staff of the PMO, will design and implement a management information system with activities checklist for the control and monitoring of all project activities in collaboration with M&E officers at the ADDs level. The performance indicators that are listed in the project matrix will be used for monitoring implementation of project activities.

5.7.2 In addition to the supervision missions by the Fund, a mid-term review will be undertaken no later than the end of the third year of project implementation. The mid-term review report will assess the progress of the project and identify major problems and constraints. Performance indicators designed in the project matrix will be used to monitor the project performance and measure achievements of the project at that stage. It will make recommendations for any desired modifications of the project as designed.

5.8 Accounts, Audit and Reporting Requirements

5.8.1 Accounts and Audit: The GOM will open a special account for the project funds. The project funds will be disbursed to a commercial bank in Lilongwe the PMO will be located to facilitate the project implementation and avoid unnecessary transaction delays. A project account will also be opened in each of the ADDs at the project area. The accountant will be responsible for the design and installation of a computerized accounting and management information system. The accountant will ensure that the accounts are maintained by the category of expenditure, source of finance and that a system of internal control is put in place to enable prompt recording of transactions, timely production of accounts and reports and safeguard of the project assets.

5.8.2 There will be a set of financial and management information records maintained in each RDP from which monthly accounts and management information would be prepared. These will be integrated into the accounts of the PMO from where consolidated quarterly financial

Table 5.3

Expenditure Schedule by Source of Finance
(In UA Million)

<table>
<thead>
<tr>
<th>Source of Finance</th>
<th>FY1</th>
<th>FY2</th>
<th>FY3</th>
<th>FY4</th>
<th>FY5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF</td>
<td>1.47</td>
<td>1.91</td>
<td>1.42</td>
<td>0.89</td>
<td>0.54</td>
<td>6.23</td>
</tr>
<tr>
<td>TAF</td>
<td>0.75</td>
<td>0.25</td>
<td>0.11</td>
<td>0.12</td>
<td>0.03</td>
<td>1.26</td>
</tr>
<tr>
<td>Government Contribution</td>
<td>0.32</td>
<td>0.18</td>
<td>0.18</td>
<td>0.16</td>
<td>0.16</td>
<td>1.00</td>
</tr>
<tr>
<td>Beneficiaries Contribution</td>
<td>0.08</td>
<td>0.18</td>
<td>0.19</td>
<td>0.15</td>
<td>0.00</td>
<td>0.60</td>
</tr>
<tr>
<td>Donor (JICA) Contribution</td>
<td>0.18</td>
<td>0.13</td>
<td>0.13</td>
<td>0.14</td>
<td>0.00</td>
<td>0.58</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2.80</td>
<td>2.65</td>
<td>2.03</td>
<td>1.46</td>
<td>0.73</td>
<td>9.67</td>
</tr>
</tbody>
</table>
statements and management reports will be prepared for inclusion in the QPR for submission to the Fund. The financial statements of the project will be internally audited by the GOM Auditor-General. An externally recognized Audit Firm, acceptable to the Bank will be retained to audit the project twice a year. Provisions have been made for this purpose. The audited financial statements will be submitted to the Fund for review and comments not later than three months after the end of each accounting year.

5.8.3 Reporting: Quarterly Progress Reports (QPR) will be prepared and submitted to the Fund in accordance with ADF procedures. Reporting on progress of project activities will be compared with set targets of the Annual Work Program Budget (AWPB). The QPR will also include detailed description of achievements of the various components and sub-components, expenditure and physical acquisitions made as well as problems encountered during the reporting period. The M&E officers in the 4 ADDs will collect and compile data from the RDPs and submit to the PMO. On the basis of the data gathered, the PM will prepare quarterly progress reports and submit copies to ADF within two weeks of the end of each reporting period.

5.9 Recurrent Costs

Project recurrent cost expenditures will cover the costs of Government staff salaries, field allowances for supervision, project management running costs and operation and maintenance of vehicles. These costs are estimated at UA 1.49 million (MK 52.92 million) during the five-year implementation period. The Government will provide funds for the local cost associated with salaries of the extension and training staff. The staff salaries are already in the Government payroll and will not have any incremental effect on the Government’s budget. As the project is designed based on Farmer Clubs format, on-farm distribution canals for the irrigation system will be maintained through the FCs system. Any other maintenance cost beyond the project completion will have a marginal impact on the Government budget.

5.10 Project Sustainability and Cost Recovery

5.10.1 Project Sustainability: The sustainability of the project will be ensured through provision of capacity building of three related institutions in terms of irrigation, horticultural and marketing technology. Intensive irrigation, horticultural and credit training programmes both formal and informal, on-the-job training and workshops will be provided to project beneficiaries through NRC of MOAI and Malawi Management Centers. Further, long training courses-regional and international training program-provided by the project and in collaboration with JICA. Project beneficiaries, in Farmer Clubs will be provided credit and training to empower them and ultimately manage their own credit, irrigation, and marketing activities as well as seed multiplication units, fruit nurseries, village-level storage facilities and food processing.

5.10.2 Adequate design has been made to ensure effective experience and group-behavioral change for self-charge of irrigation cost and water use to ensure sustainable management of the irrigation schemes. Further, establishment of community-owned savings and credit union would create practical ownership for sustainability. Provision has been made in the project to effectively supervise the activities and provide incentives to the beneficiaries so as to ensure
their fuller participation even after project implementation.

5.10.3 Cost Recovery: The GOM has put in place a mechanism for cost recovery in public financed programmes and projects. Beneficiaries under the project will pay in full for all the farm inputs, irrigation equipment and services. Project beneficiaries will pay a fee at least to cover the operation and maintenance of the irrigation schemes and the marketing platforms. Established and qualified farmer and youth groups will obtain credit at market interest rates. The Crop Production Budget shown in Annex 5 demonstrates that project beneficiaries will be in a position to service the credit facility.

6. TECHNICAL AND ECONOMIC JUSTIFICATION

6.1 Technical Justification

6.1.1 Malawi used to have abundant surface and ground water for its irrigation which has been practiced since time-immemorial. However, as a result of extremely erratic rainfall patterns and subsequent recurrent drought there has been a serious reduction of both sources of water. This phenomenon calls for immediate conservation of available water through rainwater harvesting and judicious utilization of water. The proposed project areas have considerable potential for increasing agricultural productivity through irrigation. The rural population has realized the importance of irrigation in crop production and the demand for irrigation is presently very high.

6.1.2 The irrigation technology proposed under this project is simple and already available in a small scale in the country; it has been tried by smallholders and private sector and found to be suitable. Further, as selected project area is mainly for rainfed subsistence farms, smallholder farmers use hand carried water containers for irrigation during drought season. Effective training in simple irrigation techniques and provision of irrigation pumps with micro-credit facilities for participating farmers will expedite adoption of the technology and substantially improve productivity. The training of DOI staff both in the MOAI and in the project areas will enhance their capacity to effectively communicate irrigation and related technologies to farmers and also provide the necessary backstopping for beneficiaries. The training and technology packages to be promoted will be developed in close collaboration with project beneficiaries who are the end users, front line staff and extension staff.

6.1.3 Beneficiaries will increase their benefits through diversification of high value crops. The crops proposed (para 4.2) are currently being grown by beneficiaries but higher cropping intensities and improved crop husbandry will result in increased output.

6.2 Project Benefits

6.2.1 At the national and community levels, the project will contribute significantly to food security and poverty reduction. A total of 8,500 families in the 25 EPAs will benefit from training in irrigation and horticulture technologies as well as credit and marketing facilities to be provided by the project. According to available statistics, about 40% of the total beneficiaries are expected to be women.

6.2.2 With regard to permanent irrigation schemes, with the expansion of the irrigated area,
farmers will switch to more productive and profitable cropping systems, and consequently increase the irrigated area under maize, cabbage, chillies, sweet potatoes, carrot, tomatoes, onions, paprika, and green maize. The project benefits arise principally from the introduction of more high value food crops as well as from improvements in the productivity of horticultural crops. On the basis of the analysis undertaken for the selected schemes, it is estimated that, at full development, incremental crop production will be 8,000 tonnes of maize, 9,900 tonnes of Chinese cabbage, 10,950 tonnes of cabbage, 3,300 tonnes of chillies, 8,800 tonnes of sweet potatoes, 5,950 tonnes of carrots, 7,600 tonnes of tomatoes, 8,400 tonnes of onions, 1,600 tonnes of paprika and 8,450 tonnes of green maize annually. Furthermore, due to crop diversification, nutrition levels and farm income will improve from 16.5 Kwacha to 70.0 Kwacha per person per day and consequently poverty will be reduced.

6.2.3 Social Impact: The labour intensive nature of agricultural activities will result in a significant level of incremental employment will be created by the project. In addition, the construction of civil works and the subsequent annual operation and maintenance, especially for irrigation and food processing equipment by youth, will contribute to labour demand. There will also be an increase in employment opportunities in the marketing and processing of farm produce at the community levels as well as for suppliers of crop inputs (fertilizers, pesticides, and seeds) and contract services. Although, there are some secondary impacts that have not been formally included in the project analysis, they should not be overlooked. These indirect/secondary impacts are improved nutrition and welfare of the beneficiaries which will no doubt make a significant contribution to the social and economic development of the vulnerable sections, through poverty reduction in the project area.

6.3 Financial and Economic Justification

6.3.1 Financial Justification: In order to analyze the financial benefits that would accrue to the target farmers, farm models were prepared for smallholder farmers who are expected to be trained and provided with irrigation facilities. Crops expected to be grown under irrigation are maize, cabbage, chillies, sweet potatoes, carrot, tomatoes, onions, and paprika. Quantifiable benefits would be an increased production from the 3,380 ha irrigated.

6.3.2 The resulting financial analysis shows that the annual gross revenue from crop and horticulture production under irrigation cropping by the target group is expected to rise from its present level (rainfed cropping) of MK 7.900 million (US$ 0.30 million) to MK 359.53 million (US$ 13.60 million) at full development. Net Revenue, at constant prices, will increase from MK 4.35 million (US$ 0.16 million) to MK 287.98 million (US$ 10.88 million).

6.3.3 The average farm income per person day under rainfed conditions for an average holding area of 0.40 ha is expected to increase from MK 16.5 (US$ 0.62) to MK 70 (US$ 2.65) under irrigation conditions. The average net family farm income for smallholder beneficiaries under irrigation conditions is estimated to increase from MK 4,127 (US$ 156.00) to MK 34,102 (US$ 1,288) per annum for a household of one ha at full development. The crop production budget is presented in Annex 5.

6.3.4 Economic Justification: An economic analysis was also undertaken in order to assess the economic viability of the project by calculating the Economic Internal Rate of Return
The estimated EIRR was 23%. The calculation of EIRR and the assumptions made are presented in Annex 6 and Annex 6A respectively.

6.3.5 Sensitivity analysis was also undertaken for various possible situations. An assumption was made of a 20% increase in project costs which reduced the EIRR to 17.6%. An assumption of 30% reduction in expected benefits resulted in an EIRR of 13.1%.

7. CONCLUSIONS AND RECOMMENDATIONS.

7.1 Conclusions

7.1.1 The Horticulture and Food Crops Development Project (HDP) is in line with the ADF VII Policy and strategy of poverty alleviation. The proposed project conforms to the Government’s objectives of improving smallholder crop production by promoting the adoption of improved irrigation and horticultural technology to farmers and by providing the necessary capacity building for irrigation, marketing, credit and institutional support to stimulate sustainable agricultural development.

7.1.2 Poverty alleviation strategy of the project is conceived within the framework of total beneficiary participation right from the commencement of the project implementation. The incorporation of two NGOs and a financial intermediary to train, implement and manage credit for the project will minimize Government intervention, strengthen decentralization and participatory community development. The involvement of the Farmer Clubs and Savings and Credit Community Based Unions (SCCBU) in planning, implementation and management, especially for the credit component with a built-in mechanism for credit recovery, will sustain project benefits after the project implementation period. Contribution to the investment in the construction of on-farm irrigation canals by the beneficiaries will provide them with a sense of ownership of the project which will enhance the maintenance of infrastructural facilities and add to the sustainability of the project.

7.1.3 Through increased production of food and horticultural crops and higher income accrual at household levels, the project will directly improve food security of the beneficiaries; specifically for rural women farmers, the youth and children, this will result in better nutrition and health. The development of rural infrastructure will further help the rural women to have better access to markets for small scale trading activities usually carried out by women. Communities outside the target groups will also benefit from improved access to markets and higher levels of employment generation in project related activities.

7.1.4 Participation of rural women smallholder farmers and the youth in training, farmer clubs and credit unions will empower them to assimilate higher levels of farming technology, and also create a sense of involvement, confidence and self respect. This will assist rural women to achieve higher social status which is vital for the success of any development effort. The project, therefore, is economically and financially viable, and socially desirable.

7.2 ADF Commitment Capacity

The current allocation of the ADF-VII resources for Malawi is UA 79.30 million (UA 73.06
million for ADF and UA 6.24 million for TAF). The approved commitment as at 31 October 1998 is UA 50.93 million (UA 49.93 and UA 1.00 million for ADF and TAF respectively). The anticipated total commitments as at 31 December 1998 including this project would be UA 74.84 million. Total balance therefore would be UA 4.46 million.

7.3 **Recommendations**

It is recommended that an ADF Loan not exceeding UA 6.23 million and a TAF grant not exceeding UA 1.26 million be granted to the Government of Malawi for the purpose of implementing the project as described in this appraisal report subject to the following conditions.

A) **Conditions Precedent to Entry Into Force**

Prior to entry into force, the borrower shall have:

i) established a Project Management Office (PMO) based in Lilongwe and the appointment of the required professional and support staff whose qualifications and experience are acceptable to the Fund (section 5.2);

ii) opened a special account for the project funds with a commercial bank acceptable to the Fund and which has branches in each of the Agricultural Development Divisions (ADDs) covered by the project (para 5.3.1);

iii) submitted a written undertaking that any allocation of land to be used for the Project, including customary land, shall be carried out fairly in accordance with the laws of Malawi (para 3.4.1);

iv) submitted a written undertaking concerning allocation of land to be used for the construction of four marketing depots in each of the Agricultural Development Divisions (ADDs) and collection centers in each of the Extension Planning Areas (EPAs) covered by the project (para 4.3.18);

v) submitted a written undertaking concerning that it will submit a list of staff to be trained through Japanese International Collaboration Agency (JICA) as well as a written request to JICA for voluntarily technical assistant before June 1999 (paras 4.3.2 and 4.6.1).

B) **Other Conditions**

1. Provide evidence that its contribution to the project is reflected on an annual basis in the MOAI budget;

2. Prior to any disbursement of the funds for the credit component of the project:

   (i) the Borrower and National Bank of Malawi (NBM) shall have executed, in a form satisfactory to the Fund, a binding and unconditional agreement for the administration
of the funds for the credit component;

(ii) the Borrower and the MFI shall have executed, in a form satisfactory to the Fund, a binding and unconditional agreement for the on-lending of the credit portion of the Loan funds to the beneficiary farmers; and submitted to the Fund a copy of the model agreement.
# PROJET DE DEVELOPPEMENT DE L'HORTICULTURE ET DES CULTURES VIVRIERES

ZONE DU PROJET ET AGRICULTURES BENEFICIAIRES PAR DDA, PDR ET SDV

<table>
<thead>
<tr>
<th>DDA</th>
<th>PDR</th>
<th>EPA</th>
<th>POMPES A PEDALE</th>
<th>MOTOPOMPES</th>
<th>CANAUX ELEVATRICES</th>
<th>TOTAL GENERAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Puits creusés à main d'homme</td>
<td>Puits tubulaires</td>
<td>Irrigation par gravi</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
<td>54</td>
<td>100</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Z</td>
<td></td>
<td></td>
<td>48</td>
<td>150</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>U</td>
<td></td>
<td></td>
<td>10</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>DDA DE MIZUZU</td>
<td>87</td>
<td>350</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Machingi
- Kahunu
- Akawiri
- Akawa R.S.

TOTAL DDA DE MIZUZU
- Machingi
- Kahunu
- Akawiri
- Akawa R.S.

| K   |      |     | 23 |  41 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |
| KAS  |      |     | 32 | 100 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |
| KASU  |      |     | 25 | 100 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |
| GAS  |      |     | 20 |  70 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |
| TOTAL | DDA DE KASANGU | 44 | 71 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |

Swange
- Gomondi
- Total PDR

S  |      |     | 23 |  41 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |
SAI  |      |     | 32 | 100 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |
| LIMI  |      |     | 25 | 100 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |
| MA  |      |     | 20 |  70 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |
| TOTAL | DDA DE SALIMA | 40 | 90 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |

LIL  |      |     | 15 |  50 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |
| LING  |      |     | 30 | 150 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |
| TOTAL | DDA DE LILINGWE-Ouest | 75 | 150 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |

E  |      |     | 23 |  41 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |
| TOTAL | DDA DE LILINGWE-Est | 40 | 90 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |

TOTAL DDA DE LILINGWE | 115 | 150 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |  0 |

TOTAL GENERAL
- Swange
- Gomondi
- Total PDR

**DDA** = Division de développement agricole
**PDR** = projet de développement rural
**SDV** = Secteur de vulgarisation

**PP** = Pompes à pédales
**MP** = Motopompes
**Sup.** = Superficie
**Agric.** = Agriculteur
ENVIRONMENTAL ASSESSMENT
HORTICULTURAL AND FOOD CROPS DEVELOPMENT PROJECT

The project is classified as Category II according to the ADB Environmental guidelines, as all the necessary mitigation measures has been incorporated in the project design as follows:

1. **Positive Impact**
   1.1 By raising the standard of living of the rural poor, the current rate of environmental degradation will be arrested and eventually minimized.
   1.2 The increased ground cover will minimize soil erosion.
   1.3 The project does not involve displacement or involuntary resettlement. On the other hand, the project will result higher incomes, improve the role of women, empower the farmers, and increase their environmental awareness through training, hence help sustain the project.

2. **Negative Impact**
   2.1 Possible interference with the river reserves.
   2.2 Possible deforestation and human activities in the upper reaches of the watersheds, outside the project area, which may increase the sediment load in the rivers. This load may be deposited in the project dams, thereby reducing their water storage capacity.
   2.3 Surface and river bank’s soil erosion.
   2.4 Reduced flow due to river diversion may impact the fisheries and aquatic life.
   2.5 Ground and surface water contamination due to excessive use of chemical fertilizers.

3.0 **Mitigation Measures**
3.1 The Water Resources Board and the Ministry of Agriculture (Land Resources and conservation Department) are in the process of defining the river reserves. It is very likely that a 10-metre reserve will be applied from the average flood water mark. The detailed designing of the dambo schemes will take this factor into consideration.

3.2 During rehabilitation of the dams, retention ponds will be built to trap the silt before the water enters into the dams. The silt thus trapped can be regularly dredged out and used to reclaim impoverished farm lands.

3.3 Banks of dams and canals will be planted with vegetation to minimise erosion and reduce maintenance costs.

3.4 Diversion of water from perennial rivers will be carried out in such a way as to maintain an adequate flow throughout the year. Breeding grounds for migrating fish will be maintained or increased, where warranted, along the seasonal rivers.

3.5 The application of chemical fertilisers and pesticides will be carefully monitored. Specific training will be given to staff and farmers on this issue. Farmers will also be provided with basic training in local environmental management and simple techniques in soil fertility enhancement.

3.6 Close contacts will be established with the GEF Lake Malawi/Nyasa Biodiversity Project, which has a program to monitor the quality of water entering into the lake and to carry out research.
### MALAWI

**HORTICULTURE AND FOOD CROPS DEVELOPMENT PROJECT (HDP)**

Provisional List of Goods and Services

**ADF LOAN / TAF GRANT**

<table>
<thead>
<tr>
<th>COMPONENTS</th>
<th>F.E. (UA '000)</th>
<th>L.C. (UA '000)</th>
<th>Total cost (UA '000)</th>
<th>Total cost (MK'000)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A CAPACITY BUILDING</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Goods and equipment</td>
<td>349.0</td>
<td>76.6</td>
<td>425.6</td>
<td>15,116.6</td>
</tr>
<tr>
<td>2 Training and field allowance</td>
<td>364.1</td>
<td>182.7</td>
<td>546.8</td>
<td>19,421.5</td>
</tr>
<tr>
<td>3 Studies</td>
<td>29.6</td>
<td>40.8</td>
<td>70.4</td>
<td>2,500.5</td>
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<tr>
<td>4 Technical Assistance</td>
<td>397.9</td>
<td>0.00</td>
<td>397.9</td>
<td>14,132.8</td>
</tr>
<tr>
<td>5 Farm inputs and local materials</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>6 Operation and maintenance</td>
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<td>120.6</td>
<td>402.0</td>
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<td>7 Beneficiaries contribution</td>
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<td>115.5</td>
<td>115.5</td>
<td>4,102.5</td>
</tr>
<tr>
<td><strong>B MICRO-FINANCE CREDIT</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Credit for irrigation equipment</td>
<td>761.3</td>
<td>323.3</td>
<td>1,084.6</td>
<td>38,523.3</td>
</tr>
<tr>
<td>2 Credit for food processing equipment</td>
<td>267.4</td>
<td>113.6</td>
<td>381.0</td>
<td>13,532.5</td>
</tr>
<tr>
<td>3 Credit for establishing workshops</td>
<td>21.3</td>
<td>9.1</td>
<td>30.4</td>
<td>1,079.8</td>
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<tr>
<td>4 Credit for marketing activities</td>
<td>325.0</td>
<td>138.0</td>
<td>463.0</td>
<td>16,445.0</td>
</tr>
<tr>
<td>5 Credit for farm inputs &amp; prod. material</td>
<td>353.8</td>
<td>150.2</td>
<td>504.0</td>
<td>17,901.3</td>
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<tr>
<td>6 Operation and maintenance</td>
<td>95.7</td>
<td>40.7</td>
<td>136.4</td>
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<tr>
<td><strong>C SMALL SCALE IRRIGATION</strong></td>
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<td>Seed Multiplication</td>
<td>Soil and Water Conservation</td>
<td>Livestock Production</td>
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<td>0.026</td>
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# MALAWI

**HORTICULTURE AND FOOD CROPS DEVELOPMENT PROJECT (HDP)**

## Tentative Implementation Schedule

<table>
<thead>
<tr>
<th>Activity/Action</th>
<th>Initiator</th>
<th>Starting</th>
<th>Ending</th>
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<tr>
<td><strong>1 Administration</strong></td>
<td>ADF</td>
<td>Dec-98</td>
<td>Dec-98</td>
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<td>ADF/GOM</td>
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<td>ADF/GOM</td>
<td>Jun-99</td>
<td>Jun-99</td>
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<tr>
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<td></td>
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<tr>
<td>Office allocated and furnished</td>
<td>MOAI/DOI/DOCP</td>
<td>Jun-98</td>
<td>Jul-98</td>
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<tr>
<td>Personnel assigned</td>
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<td>Aug-98</td>
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<td>Sep-99</td>
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<td>Sep-99</td>
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<td>Sep-99</td>
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<td>Commencement of farmer grouping &amp; training</td>
<td>MOAI/PMO/NGOs</td>
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<td><strong>3 Vehicles, Office &amp; Field Equipment</strong></td>
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<td>List of suppliers drawn and approved</td>
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<td>Sep-99</td>
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<td>Bids received and evaluated</td>
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<td>Nov-99</td>
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<tr>
<td>Tenders awarded</td>
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<td>Nov-99</td>
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<td>Supplier/PMO/DOI</td>
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<td>Dec-02</td>
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<td><strong>4 Training at NRC &amp; Overseas</strong></td>
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<td>Aug-99</td>
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<tr>
<td>Overseas training reserved</td>
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<td>Aug-99</td>
<td>Oct-99</td>
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<td>Sep-01</td>
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<tr>
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<td>Oct-01</td>
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<td>Farmer training started</td>
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<td>Oct-99</td>
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<td>Sep-00</td>
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<td>Oct-01</td>
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<tr>
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<td>Dec-99</td>
<td>Nov-01</td>
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<tr>
<td>Contracts signed</td>
<td>MOAI/PMO/DOI</td>
<td>Dec-99</td>
<td>Nov-01</td>
</tr>
<tr>
<td>Commencement of services &amp; completed</td>
<td>Consultants</td>
<td>Jan-00</td>
<td>Jan-01</td>
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<tr>
<td><strong>6 Establishment of Credit System</strong></td>
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<td>DOI/ADF/AMINA</td>
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<td>Nov-99</td>
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<td>Nov-99</td>
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<td><strong>7 Civil Works for Irrigation &amp; Marketing</strong></td>
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<td>Nov-02</td>
</tr>
<tr>
<td>Bids invited</td>
<td>MOAI/PMO/DOI</td>
<td>Jan-00</td>
<td>Dec-02</td>
</tr>
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<td>Jan-02</td>
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<td>Jun-02</td>
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<td>Jul-02</td>
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<tr>
<td>Construction commence &amp; completed</td>
<td>Contractors</td>
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<td>Feb-02</td>
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<td><strong>8 Small Scale Irrigation Equipment</strong></td>
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<td>Sep-99</td>
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<td>Nov-99</td>
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Crop Production Budget

Existing Situation per ha
of Rainfed Farming

<table>
<thead>
<tr>
<th>Crop</th>
<th>Maize</th>
<th>Cassava</th>
<th>Sweet Potatoes</th>
<th>Ground Nut</th>
<th>Pigeon Pea</th>
<th>Sorghum</th>
<th>Soybean</th>
<th>Tobacco</th>
<th>Cotton</th>
<th>Cow Pea</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Prod (Kg/ha)</td>
<td>1,850</td>
<td>2,850</td>
<td>3,200</td>
<td>430</td>
<td>280</td>
<td>580</td>
<td>700</td>
<td>980</td>
<td>750</td>
<td>225</td>
<td>4,660</td>
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<tr>
<td>Price (MK/kg)</td>
<td>2.5</td>
<td>3</td>
<td>18</td>
<td>3</td>
<td>3</td>
<td>15</td>
<td>5</td>
<td>2</td>
<td>2</td>
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<td>6.7</td>
</tr>
<tr>
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<td>8,550</td>
<td>6,400</td>
<td>7,740</td>
<td>880</td>
<td>2,040</td>
<td>2,100</td>
<td>14,700</td>
<td>3,750</td>
<td>450</td>
<td>4,574</td>
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II. INPUTS COSTS

<table>
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<tr>
<th>Item</th>
<th>Seed</th>
<th>Fertilizer</th>
<th>Manure</th>
<th>Pesticides</th>
<th>Bags</th>
<th>Hired Labour</th>
<th>Credit Repayment</th>
<th>Total Costs (MK)</th>
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<tbody>
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<td>Average</td>
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<td>0</td>
<td>65</td>
<td>0</td>
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<td>127</td>
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<td>0</td>
<td>150</td>
<td>0</td>
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<td>0</td>
<td>7,425</td>
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III. Net Benefits

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<td>Per Person Day</td>
<td>18.1</td>
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* = As the average holding land is 0.37 ha, return per person day is calculated to be (MK 44 x 0.40 ha) = MK 17.5

Envisaged Situation per ha (three seasons) * of Irrigated Land

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<thead>
<tr>
<th>Crop</th>
<th>Maize</th>
<th>Chinese Cabbage</th>
<th>Cabbage</th>
<th>Chillies</th>
<th>Sweet Potatoes</th>
<th>Carrot</th>
<th>Tomatoes</th>
<th>Onions</th>
<th>Paprika</th>
<th>Green Maize</th>
<th>Total</th>
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<tbody>
<tr>
<td>Average Prod (Kg/ha)</td>
<td>6,000</td>
<td>19,556</td>
<td>15,207</td>
<td>4,911</td>
<td>6,500</td>
<td>8,804</td>
<td>5,000</td>
<td>10,000</td>
<td>2,400</td>
<td>10,000</td>
<td>8,859</td>
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<tr>
<td>Price (MK/kg)</td>
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<td>3</td>
<td>2.5</td>
<td>3.5</td>
<td>2.75</td>
<td>2.65</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
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<tr>
<td>Gross Income (MK)</td>
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<td>58,668</td>
<td>40,118</td>
<td>86,398</td>
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<td>44,020</td>
<td>58,900</td>
<td>50,000</td>
<td>60,000</td>
<td>40,000</td>
<td>47,627</td>
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</table>

II. INPUTS COSTS

<table>
<thead>
<tr>
<th>Item</th>
<th>Seed</th>
<th>Fertilizer</th>
<th>Manure</th>
<th>Pesticides</th>
<th>Bags</th>
<th>Hired Labour</th>
<th>Credit Repayment</th>
<th>Total Costs (MK)</th>
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<tr>
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<td>855</td>
<td>75</td>
<td>225</td>
<td>320</td>
<td>125</td>
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<td>850</td>
<td>550</td>
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<td>3,200</td>
<td>1,420</td>
<td>364.55</td>
<td>3,240</td>
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<tr>
<td>Cost per ha</td>
<td>1,620</td>
<td>1,620</td>
<td>1,620</td>
<td>1,620</td>
<td>1,620</td>
<td>1,620</td>
<td>1,620</td>
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</table>

III. Net Benefits

<table>
<thead>
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<tbody>
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<td>Total Per Person Day</td>
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<tr>
<td>Per Person Day</td>
<td>60.8</td>
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</table>

* Under irrigation, one ha is expected to be cultivated 2.5 times during the year at the project completion

- As the average holding land is 0.40 ha, return per person day is calculated to be (MK 173 x 0.4 ha) = MK 70

Annex 5

HORTICULTURE AND FOOD CROPS DEVELOPMENT PROJECT (HDP)
## MALAWI

**HORTICULTURE AND FOOD CROPS DEVELOPMENT PROJECT (HDP)**

Calculation of the Economic Rate of Return

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<th>Without Project</th>
<th>With Project</th>
<th>Total</th>
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<td>Investment Cost</td>
<td>Operating Cost</td>
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<td>75285.0</td>
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<td>PY2</td>
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<td>17940.4</td>
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<td>PY3</td>
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<td>54261.6</td>
<td>18025.6</td>
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**Benefits (in MK'000)**

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**Incremental Benefits (in MK'000)**

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**Net Benefits (in MK'000)**

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Calculation of Economic Rate of Return (EIRR) = 0.2319151968