

# **ENVIRONMENTAL ASSESSMENT AND SCREENING REPORT**

on the project

**Improving Productivity and Market Success of Ethiopian Farmers**

**Pilot Learning Wereda:**  
**Atsbi Wemberta**

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## ENVIRONMENTAL ASSESSMENT AND SCREENING REPORT

### Improving Productivity and Market Success of Ethiopian Farmers Pilot Learning Wereda: Atsbi Wemberta

#### 1. Project Description

The project covered by this Screening Report is the 2006 programme of technology packages being introduced in Atsbi Wemberta Wereda, Tigray Region, a Pilot Learning Wereda (PLW) of IPMS Ethiopia (Improving Productivity and Market Success of Ethiopian Farmers), that are considered likely to have potential environmental impacts.

The Responsible Authority is CIDA.

The project consists of four related technology packages to be adopted and disseminated under the IPMS in the PLW: (i) Land closure for livestock and bee forage, and improved watershed management, (ii) Development of irrigation potential, (iii) Cultivation with agrochemicals, and (iv) Use of livestock and poultry drugs and chemicals.

The technology packages covered constitute components of an integrated programme for the PLW, implemented by the local farmers through the wereda agricultural office and facilitated and supported by IPMS. They are screened here as one single project for environmental assessment purposes due to the fact that they are to be implemented jointly and their impacts are interrelated and are therefore best assessed jointly.

The project is a point project, limited to the geographic extent of Atsbi Wemberta Wereda.

*It should be noted that the following are not included in this EASR, which covers only activities with potentially harmful impacts on the environment:*

- (i) A number of measures for improved environmental management;*
- (ii) The introduction of new crop varieties that will not be accompanied by any significant changes in technology or production method, and will not have any environmental linkages or impacts.*

The project activities concerned may be summarized as follows:

#### 1.1 Land Closure

The project will encourage the use of closed areas for livestock and bee forage, and improved watershed management purposes, which might temporarily oblige cattle formerly grazing in such areas to seek more marginal grazing land.

## **1.2 Development of Irrigation Potential**

IPMS will introduce through the wereda agricultural office an expanded programme of fruit and vegetable cultivation accompanied by more extensive use of small-scale irrigation using shallow wells, run-off ponds and river diversions.

## **1.3 Cultivation with Agrochemicals**

The fruit and vegetables expansion programme will incorporate the limited use of agrochemicals, principally pesticides.

## **1.4 Use of Livestock and Poultry Drugs/chemicals**

An improved dairy, livestock fattening and improved poultry programme will be accompanied by the modest utilization of veterinary drugs and chemicals. It is intended that these will be supplied by private suppliers, the volume depending on the demand.

## **2. Description of Project Surroundings**

The PLW, with a 2003 population of 108,700, is located approximately 65 km north-east of Mekelle. Access to the principal town, Atsbi, is from Mekele via the town of Agulae. To the east, the PLW borders Afar Regional State.

The PLW consists of highlands to the north and west, with an escarpment falling to a plain to the east and south. Altitude ranges from 918 to 3,069 m, 75% of the PLW being upper highlands (2,600 m or above). Altitude and rainfall increase from south to north and east to west.

Some 61% of the PLW is classified as forest. 9% is cultivated, and a further 24% is classified as potentially cultivatable. The remaining 6% is grazing land.

Shortage of rainfall is a major constraint on agricultural production in the PLW. Atsbi is classified as a drought-prone wereda.

The farming system in the upper highlands includes barley, wheat, pulses and small ruminants. The system in the lower lands – to the east and south – consists of teff, wheat, barley, livestock and apiculture, which is popular, particularly in Hayelom PA, which accounts for some 80% of the 6,729 bee-hives presently in use in the PLW.

Household energy fuel is mainly cow dung briquettes, with some fuelwood.

Natural forests in the PLW are extensive. They are found mainly in the highlands and on the eastern Afar boundary. Scattered closed areas of acacia forest are to be found in the lowlands.

Fauna is limited mainly to the mountainous areas.

Although the wereda is close to historic areas to the west such as Wukro, cultural heritage sites in Atsbi Wemberta are limited mainly to churches, mosques and burial grounds, which will remain unaffected by the project. It is not considered likely that there are unregistered cultural heritage sites in the PLW; in any case, if there are, it should be noted that the project does not include any excavations likely to affect such sites.

### *Existing Environmental Issues*

Atsbi has a fragile environment. Rainfall is usually intense but of short duration, and unpredictable, making the PLW drought-prone.

The principal environmental issues in the PLW are as follows:

- Much of the soil in the PLW is shallow and thus has low water-retention capacity, and the steep slopes of the surrounding mountains are prone to soil degradation and loss of vegetation. Terracing, afforestation and other soil and water conservation measures have been, and continue to be, implemented throughout the wereda. In some locations eucalyptus stands have been planted for pole production.
- Run-off from the mountain slopes has created, and continues to create, severe gulleying and river bed erosion. Some community-based gulley reclamation and river bed stabilisation activities have been promoted by the wereda ARD NRM team.
- Recurrent droughts have encouraged the introduction of water-harvesting, particularly the use of run-off ponds, which presently number around 3,000.
- Despite being drought-prone, the wereda has significant undeveloped ground-water potential, and the digging of shallow wells is now gaining popularity.
- Night frosts and high winds after the rains of July-August, particularly in the highland areas, add to the difficulties of crop cultivation.

### **3. Environmental Effects and Public Concerns associated with Planned Initiatives**

Table (i) sets out:

- Possible negative environmental impacts before the introduction of mitigating measures;
- Planned mitigating measures;
- Expected negative environmental impacts after implementation of mitigating measures.

*Notes*

- It should be noted new crop varieties will be limited to those produced and approved by government public bodies, notably the Ethiopian Seed Enterprise (ESE) and the Ethiopian Agricultural Research Organisation (EARO). No varieties involving any form of genetic engineering, or likely to introduce new environmental impacts, will be introduced.
- Expanded cultivation of fruit and vegetables will be accompanied by organic fertilizer and composting programmes, thus producing a positive environmental impact.
- The promotion of apiculture will in turn promote bee forage, which will result in a growth in vegetation and pollination, leading to the flourishing of springs and a general improvement in the biophysical environment.

*Public Concerns*

- Increasing water harvesting, especially in the lower areas of the wereda could trigger malaria incidences.
- As a result of supporting irrigation development for vegetable production groundwater may be depleted.
- Expansion of water harvesting schemes may threaten human and livestock life.

*Project Phases*

Table (i) relates to the operations phase of the project. There is no pre-construction phase, construction or closure phase. Accidents and malfunctions are covered within the Integrated Pesticide Management (IPM) Plan.

Table (i) incorporates both direct and indirect impacts.

**Significance of Adverse Environmental Effects (after implementation of Mitigating Measures)**

No significant adverse effects are likely.

**4. Mitigation Measures**

Technically and economically feasible mitigation measures are set out in Table (i).

**Table (i) Matrix of Mitigating Measures and Likely Impacts after taking Mitigating Measures into account**

| <b>Activities:</b>                                | <b>Land Closure for Livestock and Bee Forage, and Improved Watershed Management</b>   | <b>Development of Irrigation Potential</b>   | <b>Cultivation under Agrochemicals</b>   | <b>Use of Livestock and Poultry Drugs &amp; Chemicals</b>   |
|---|---|--|--|---|
| <b>Likely Impacts before Mitigating Measures</b>  | (i) Closure of land for bee forage crops might oblige cattle to seek marginal grazing lands.  | (i) Use of irrigation may result in salinisation and consequent soil encrustation.<br>(ii) Use of irrigation may result in depletion of ground water.<br>(iii) Shallow wells and water harvesting ponds may pose a hazard to human and animal life, especially children.   | (i) Uncontrolled or careless use of agrochemicals may pollute the groundwater, resulting in health hazards for human and animal life, and may pose a hazard for bee harvesting of both water and pollen.   | (i) Uncontrolled or careless use of livestock veterinary drugs or chemicals may pollute the groundwater, resulting in health hazards for human and animal life.                         |
| <b>Mitigating Measures</b>                        | (i) Closure will be done only by common agreement with cattle-owners using the land for grazing;<br><br>(ii) Zero-grazing, presently being promoted by the Wereda ARD Office, will be encouraged, incorporating controlled grass harvesting from closed land. | (i) Irrigation will be small-scale, and will not involve flooding. Thus salinisation is not likely to be a problem. However, in the unlikely event that it becomes an issue in some areas, measures will be implemented such as balanced surface water use, choice of salinity-tolerant crops, and spate irrigation for flushing as appropriate.<br>(ii) To avoid excessive reductions in water-table by extensive use of small-scale irrigation, water-table levels will be closely monitored by the wereda agricultural office.<br>(iii) The project will recommend for shallow wells: cover or protection, and designs enabling anyone who falls in to climb out. For ponds: protection, and safer designs. | (i) An Integrated Pesticide Management (IPM) plan covering use of a combination of natural methods and agrochemicals will be drawn up and implemented, covering acquisition, application, accidents, storage and disposal of agrochemicals.<br><br>In addition, the location of use will take into account proximity to PAs dependent on apiculture. Where the bees are close to application areas such as orchards, the possibility of confining application to a timetable taking into account bee forage patterns will be determined. | A Drugs and Chemicals Management plan will be drawn up and implemented, covering acquisition, application, accidents, storage and disposal of livestock veterinary drugs and chemicals. |
| <b>Likely Impacts (after mitigating measures)</b> | After implementation of mitigating measures, no adverse environmental impacts are expected.   | After implementation of mitigating measures, no adverse environmental impacts are expected.  | After implementation of mitigating measures, no adverse environmental impacts are expected.  | After implementation of mitigating measures, no adverse environmental impacts are expected.   |

## **5. Cumulative or Interactive Environmental Effects**

The following potential long-term cumulative effects could be postulated:

### **5.1 Ground-Water Pollution and Water-Table**

Unexpected growth in the popularity of fruit and vegetable cultivation might potentially cause groundwater pollution and reduction in the water-table. However, the mitigation of both of these cumulative impacts has been covered by Table (i).

### **5.2 Ratio of Cash:Food Crop Production**

If the cultivation of cash crops becomes so popular that cash crops come to displace food crops to a significant extent, this could produce an imbalance that might lead to food shortages within, or outside, the PLW. However, the *wereda* Agriculture Office and the Regional Food Security Bureau have planning systems to address such a trend before it becomes a problem.

### **5.3 Loss of Species Diversity**

Uncontrolled adoption throughout the PLW and beyond of a newly introduced crop species and livestock breeds could lead to a situation whereby the genetic base of the crop and livestock concerned is unduly narrowed. This could mean, for example, that in the event of an outbreak of disease, there is no alternative strain available. It is thus recommended that the regional or *wereda* agricultural office should monitor production rates of new crop varieties, and should liaise with the Biodiversity Institute to ensure that the gene banks contain alternative varieties.

### **5.4 Urban Zero-Grazing**

Although the Project is not promoting zero-grazing in high-density urban areas, the zero-grazing being promoted (which by reducing grazing and often livestock numbers is generally environmentally beneficial) may eventually lead to uncontrolled adoption of zero-grazing in high-density urban areas, with resultant health hazards, noise and smell pollution. To avoid this happening, the project will liaise with the urban Public Health authority and will include their representative in training workshops, in order that any regulations controlling the keeping of cattle in the urban areas are recognized and enforced.

## **6. Effects of the Environment on the Project**

6.1 Extended periods of drought and/or moisture stress would reduce the availability of surface water for irrigation of the extended cultivation of fruit and vegetables. However, the encouragement of individual shallow wells is designed to offset such eventualities.

6.2 Frost and hail, insect pests and diseases may inhibit the cultivation of pulses, but the project activities include the necessary crop protection measures and alternative, frost-resistant species required to alleviate these production problems.

6.3 Frost may cause the death of bees using hives following the new wooden designs. The mitigating measures would include adopting the traditional hives, which have better cold insulation.

## **7. Nature of Public Participation**

There has been extensive public participation in the design of the IPMS interventions in this PLW. In addition, a number of training sessions for farmers and Development Agents (DAs) and visits to various areas for training purposes have been conducted since the launching of the project.

## **8. Follow-up Program**

A follow-up program to ensure that the recommended mitigating measures are implemented as required will be conducted by the staff of the Environment and Natural Resources Unit in the wereda agricultural office, with support from IPMS as required.

## **9. Relevant Matters**

In the project design workshops, it was agreed by the community and the wereda agricultural office that there are no viable alternative means for conducting the project, other than by supporting the wereda office and the DAs.

The following transboundary effects may theoretically be possible:

- 9.1 In the long-term, in the event of widespread take-up of agrochemical-supported fruit and vegetable cultivation, ground-water or run-off pollution in adjacent areas outside the wereda might result. However, the mitigating measures in Table (i) are designed to avoid this occurring. Nonetheless, it is recommended that the Wereda Agricultural Office monitor pollution levels in the wereda before such an eventually can occur.
- 9.2 In the long-term, the increased treatment in the Wukro tannery of hides and skins from Atsbi Wemberta Wereda could exacerbate pollution problems in Wukro. Although the operations of this tannery lie outside the compass of the present EASR, it is recommended that in view of the good relationship between the project and the management of Wukro tannery, the operations of the tannery should constitute a case study in future EIA training programmes in the PLW,



whereby trainees study any environmental impacts of the tannery, and make appropriate recommendations to management for impact mitigation.

## **10. Sources for the Screening Report**

The sources of information used for this Screening Report are as follows:

- The environmental overviews in the *IPMS Project Implementation Report*, March, 2005,
- The IPMS Environmental Framework,
- *Atsbi Wemberta Pilot Learning Wereda Diagnosis Program Design*, October, 2004.
- Consultations with IPMS Project Director and expert Addis Ababa – based staff, including Kahsay Berhe.
- Joint PLW environmental reconnaissance by IPMS Environmental Consultant Ian Campbell and Dr Gebremedhin Woldewahid (IPMS RDO),
- Consultation with Addis Ababa-based CIDA Environmental Officer, *Ato* Tamene Tiruneh,
- Consultation with:
  - *Ato* Hailay Berhane, (Head OoARD)
  - *Ato* Negus Esmael, (Tirgay BoARD, Head Department, Forestry)

## **11. Comments/Recommendations**

Comments and recommendations to the extent appropriate have been included in Section 9 above.

## **12. Additional Supporting Documents**

None.