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## ECOSYSTEM-BASED ADAPTATION TO CLIMATE CHANGE

**ECOSYSTEM-BASED ADAPTATION IS THE USE OF BIODIVERSITY AND ECOSYSTEM SERVICES AS PART OF AN OVERALL ADAPTATION STRATEGY TO HELP PEOPLE TO ADAPT TO THE ADVERSE EFFECTS OF CLIMATE CHANGE. THIS APPROACH INCLUDES THE SUSTAINABLE MANAGEMENT, CONSERVATION AND RESTORATION OF ECOSYSTEMS THAT TAKES INTO ACCOUNT THE MULTIPLE SOCIAL, ECONOMIC AND CULTURAL CO-BENEFITS FOR LOCAL COMMUNITIES.**

### LAKE HAWASSA'S ECOSYSTEM

Lake Hawassa catchment is a sub-basin of the East African Rift Valley Basin covering an area of 1,411 km<sup>2</sup> with altitude ranges of 1,559 to 2,829 metres above sea level. It is inhabited by a population of 4.6 million, 41% of whom are female, and 85 % of whom live in rural areas, depending mainly on agriculture and small businesses. The rural population density is about 2,804 person/ km<sup>2</sup>.

### THE CHALLENGE

The ecosystem has changed through years mainly due to:

- Intensive use of natural resources without proper care
- The expansion of Hawassa City
- Population pressure
- The recent loss of Lake Chelleyeka (usually described as Lake Hawassa's kidney due to its filtering function of floodwater)
- Increased sedimentation in the lake due to extensive soil erosion
- Overfishing
- Pollutants: solid and liquid waste from manufacturing plants and the residential, business and service sectors
- Substantial changes in land use. Between 1986 and 2017:
  - Forest land decreased by 5,370 hectares
  - Wetlands fell by 2,596 hectares
  - Shrubland decreased by 5,431 hectares

## CLIMATE-SMART AGRICULTURE

The five-year Improving Smallholder Livelihoods through Climate-Smart Agricultural Economic Development project aimed to alleviate poverty and build resilient, sustainable livelihoods in Ethiopia's SNNP and Oromia regions.

Funded by Irish Aid, a consortium of SOS Sahel Ethiopia, Self Help Africa, Vita and Farm Africa worked with more than 50,000 households, with a particular focus on poor farmers, women, children and landless youth. This booklet is one of a series of seven focusing on each of the project's key components:

1. Small-scale irrigation
2. Cooperative-based seed multiplication systems
3. Mango value chain development
4. Ecosystem-based adaptation to climate change
5. Engaging women in entrepreneurial farming businesses
6. Promoting CSA through revitalising Farmer Training Centres
7. Promoting fuel-saving stoves

 **FARM AFRICA**

 **Self Help Africa**

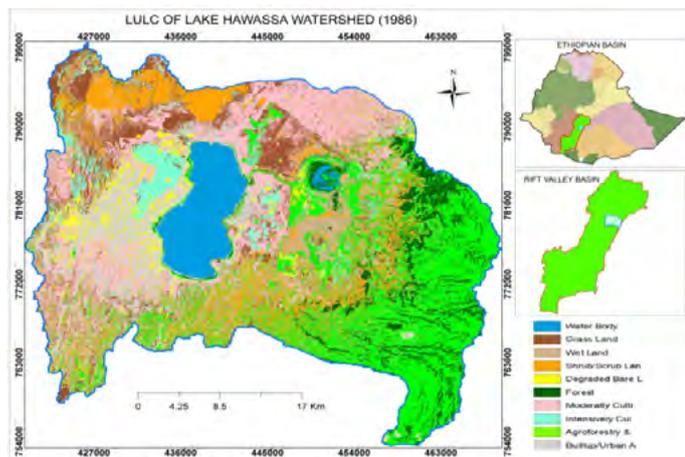
 **SOS SAHEL**  
ETHIOPIA

 **Vita**  
Building Sustainable Livelihoods

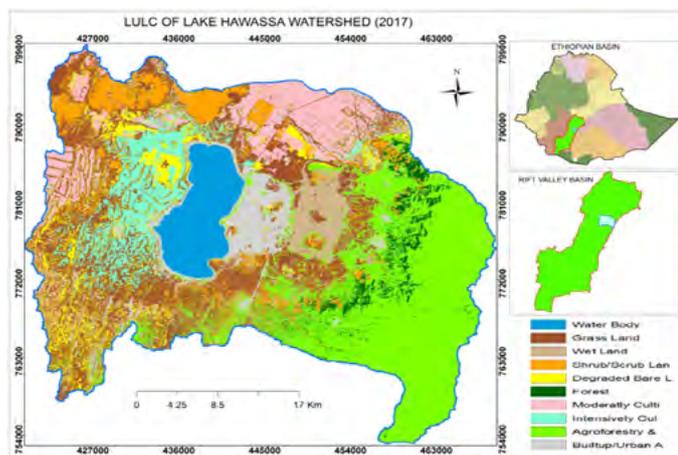
The three major challenges in the sub-basin adversely affecting the ecosystem are:

- Environmental degradation (loss of biodiversity)
- Siltation
- Pollution of the lake

Several studies have shown that Lake Hawassa could disappear in the near future unless relevant actions are undertaken.



Picture 1a: Land Use Land Cover (LULC) of Lake Hawassa watershed (1986)



Picture 1b: LULC of Lake Hawassa watershed (2017)

## PROJECT APPROACH

The Climate-Smart Agriculture project has intervened in the area since 2014 to address the above ecosystem challenges. It has been designed to apply ecosystem-based adaptation and climate-smart agricultural activities in the wider landscape approach in order to effectively manage the interconnected eco-systems and socio-economic activities.

## MAJOR INTERVENTIONS

- Restoring hillsides and biodiversity of the lake
- Introduction of climate-smart agriculture (conservation agriculture, crop intensification and small-scale irrigation)
- Introduction of sustainable fishery management practices
- Control of the lake's pollution through solid waste and buffer zone management
- Institutionalisation of the Lake Hawassa sub-basin management
- Job creation for landless youths and poor women



## RESULTS

With the concerted efforts of the project and its stakeholders (target communities, district to regional government offices, Hawassa City Administration and universities located in the project area) the following results have been achieved:

- 2,855 hectares of degraded hillsides were rehabilitated and changed to productive use, and 5,255 landless youths generated a total income of 2,225,414 ETB from the regenerated hillsides through different income-generating activities.
- 2.1 million multi-purpose trees were planted on 2,855 hectares of degraded lands and 1.5 million fruit trees were planted on 681 hectares of farmland.
- 41 household fishponds and one fish restocking pond were constructed and started producing fish in order to relieve pressure on the lake fishery, generate income for farmers and improve household nutrition.
- 329 m<sup>2</sup> trash racks and 161 dustbins were constructed in Hawassa City to manage solid waste and prevent it from entering the lake.
- 5,828 farmers in 16 villages adopted climate-smart agriculture practices on 1,383 hectares of land and the practice was scaled up by the Southern Nation Nationalities People's Regional government to 16 woredas in five zones.
- 1,364 women were organised into 60 Village Saving and Loan Associations (VSLAs) and engaged in different income-generating activities.
- A voluntary association named the *Association of Friends of Lake Hawassa (AFLAH)* and a forum named the *Forum for Integrated and Sustainable Lake Hawassa Watershed Development and Management (FISLFHWDM)* were established by government offices, NGOs and like-minded individuals to coordinate citizens' movements and the implementation of ecosystem adaptation projects in the sub-basin.





## KEY LESSONS

- The project has shown that the traditional dichotomy of urban versus rural planning and development is no more a solution for newly emerging climate challenges. Working to harmonise the urban-rural interface is important to maximise the benefits of ecosystem-based adaptation initiatives.
- An integrated landscape approach has helped to reduce tradeoffs between different land uses and maximise ecosystem services. Restoration interventions on hillsides enhanced groundwater recharging and reduced downstream flooding of farmlands, which has played a big role in expanding small-scale irrigation outside the buffer zone of Lake Hawassa.
- An usufruct (the right to use others' property) procedure introduced by the project on communal hillsides created huge employment opportunities for landless and jobless youths and contributed to the sustainable use of communal lands, which have been threatened by the tragedy of the commons situation.
- The Hawassa Catchment ecosystem-based adaptation actions and the Buffer Zone experiences have been scaled up across Rift Valley ecosystems by a new Rift Valley conservation project funded by the Swedish International Development Agency designed to create critical mass and synergy between the two initiatives.
- Our ecosystem-based adaptation approach and experiences are contributing to and in tandem with global initiatives designed to combat climate change effects, including Sustainable Development Goal 7 and 13, and the climate action priority in Ireland's Policy for International Development "One World One Future" and "A Better World".