Experience of GIZ Sustainablle Land Management Program on agricultural water management in Amhara

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1. BACKGROUND

SLMP is a national program under implementation in six regions of the country since 2009

Objectives of the SLMP

Development objective:

Reduced, halted and reversed land degradation in agricultural landscapes and improved agricultural **productivity & income growth** and increased **tenure security** of smallholder farmers in the region

Intervention Areas of SLMP in Amhara Region

Funding sources	Zones supported	No. of woredas	No. of critical watersheds	No. of micro watersheds	Area	HH
SLM-WB	7	18	11	253	131,242	44,239
SLM-KfW	6	10	10	197	99,377	13,964
CIDA-LAND	5	6	6	110	60,000	11,500
EU-GCCA	5	12	12	12	8,172	5,790
Total	**9**	**33**	**27**	**572**	**298,791**	**75,493**

COMPONENTS OF SLMP

- **Watershed management**
  - ➔ Capacity building of implementing partners
  - ➔ Communal land rehabilitation
  - ➔ Farmland and homestead development
  - ➔ Promotion of livestock production system
  - ➔ **Community infrastructure development**
  - ➔ Promotion of income generating activities
- Land administration
- Project management

Agricultural Water Management

The management of all water put into agriculture in the continuum from rainfed systems to irrigated agriculture

Main challenge facing AWM ?

- meeting ever rising demand for food
- increasing farmer incomes & reducing poverty, and
- protecting the environment,

all from an increasingly constrained water resource base

2. In-situ Moisture Harvesting Structures

- Land degradation is the main threat in Amhara region.
- As a result, large areas are devastated

Farmland (left) and grazing area (right) changed into big gullies

Cont'd…

- To mitigate these problems, the regional government, communities and development partners have undertaken tremendous efforts
- The effort made by the GIZ-SLM Amhara in this endeavor has been impressive.
- Consequently, various SWC/in-situ moisture harvesting structures were executed in different land use/cover types
- Hence, remarkable achievements have been made towards rehabilitating degraded areas
- *Some of the success stories are….*

Cont’d

Check dams have to be complemented with biological measures for sustainability

3. IRRIGATION WATER MANAGMENT

Small-scale irrigation

- promote rural food security & poverty alleviation
- enables household to generate more income, and in some case transform livelihoods
- Increase resilience (adaptation to climate change)

SSI is given high priority by GoE (policy, strategies….)

- Water Resources Management Policy; Water Sector strategies; Water Sector Development Program
- GTP (2011-2015)

cont'd……

GIZ-SLM has supported irrigation development on:

- Upgrading traditional irrigation scheme by constructing:
  - ➔ diversion of weir and water abstraction structure
  - ➔ masonry lined canal
  - ➔ cross drainage works & other canal appurtenants
- Promotion of rainwater harvesting and management
- Promotion of water lifting device
- Promotion of drip irrigation as water saving technology

cont'd……..

- GIZ-SLM Amhara provide a number of capacity build work through training to partners in area of irrigation
- Experience sharing visit within and outside the region
- Water management study in three irrigation scheme in collaboration with Bahir Dar university
- Piloting manual drilling

3.1 Upgrading traditional irrigation scheme

Rational for upgrading traditional irrigation scheme

Increase the efficiency of irrigation water

- Minimize loss of water through abstraction & distribution
- Prevent frequent flood damage to locally built diversion
- Conveying water over large streams/gullies
- Prevent destruction of forest & local material
- As one of adaptation measure to climate change in WRM

Upgrading traditional scheme cont'd……

Basic information on scheme

- No of scheme 14 (constructed/under construction)
- No of woreda 12
- Irrigated area 1349 ha
- Beneficiaries 2462 household
- Type of scheme Diversion weir (4)
  Masonry lined canal
  RC and PVC flume aqueduct
  Rehabilitation of existing scheme
  Irrigation structure like culvert, foot bridge…..

Upgrading traditional scheme cont'd…..

No	Name of the project	Woreda	Kebele	Area ha	Benef. HH	Rem.
1	Inchatamp	Fagita Lekoma	Gafera	312	303	
2	Upper Guder	Fagita Lekoma	Endoweha	110	266	U/C
3	Dawaja Menkeria	Burie Zuriya	GulumDejen	83.75	170	
4	Zagra	Burie Zuriya	Adal Agata	80	300	
5	Arno	Gondar zuriya	Sorsaroha	47	81	
6	Crossing structure	Tarmaber	Asfachew	240	366	4 in No
7	Crossing structure	Shewarobit	Kebele 07/08	100	251	3 in No

Upgrading traditional scheme cont'd…..

No	Name of the project	Woreda	Kebele	Area ha	Benef. HH	Rem.
8	Crossing structure	Ansokia	Assele keleb.	211	388	
9	Angot	Dembecha	Angot	30	60	
10	Garima	Gozamin	Yenebirna	15.5	37	
11	Meseno Weha	Estie	Zegora	25	50	U/C
12	Gota	Andabet	Shemegorgis	25	50	U/C
13	Chebera	Quarit	Chefekat	10	20	U/C
14	Gibaza	Takussa	Mekoneta	60	120	U/C
Total				**1349**	**2462**	

Upgrading traditional scheme cont'd…..

A = 312 ha & B =303 HH

Traditional diversion and modern diversion weir of Inchatamp irrigation project- Fagita Lekoma woreda

Upgrading traditional scheme cont'd…..

Wooden log aqueduct and RC flume aqueduct (right) of Inchatamp irrigation Fagita Lekoma woreda

Upgrading traditional scheme cont'd…..

A = 80 ha & B =300 HH

Traditional diversion point and intake structure of Zagra irrigation project in Burie zuriya woreda

Upgrading traditional scheme cont'd…..

A = 60 ha

Traditional crossing structure made by the community and RC aqueduct flume constructed by the project in Tarmaber woreda

Upgrading traditional scheme cont'd…..

PVC flume aqueduct under construction

3.2 Rain Water Harvesting Ponds

- WHP at the HH is an important strategy to bridge water deficits and assist in addressing food insecurity
- However, WHP must be implemented as per the standard and specification inorder to be effective
- WHP had been constructed in Amhara Region long years ago, and it was implemented extensively in the years of 2000 to 2005
- Successful achievements had been made on some area & while failure was also observed on some other area

WHP cont'd

- The experience of GIZ-SLM in WHP was not extensive, however, recently WHP was given due emphasis
- The WHP was implemented as per the standard taking into account the success and failure story from the past
  - Training has been given to partners in WHP
  - 62 WHP was constructed in seven woreda (BMZ fund)
  - 27 WHP was constructed in 12 woreda (GCCA)
  - The package include geomebrane, silt trap, inlet pipe, water lifting device and supposed to be combined with drip irrigation

WHP under construction in Gozamin & Sinan woreda

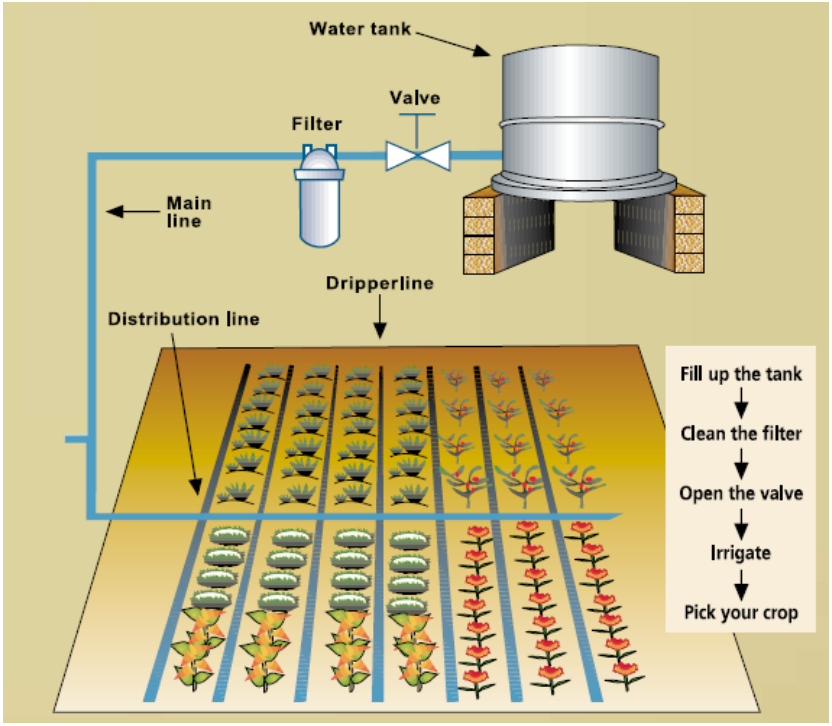
Proper construction of silt trap was a prerequisite for proper function of WHP

Silt trap for WHP in Burie zuriya woreda

3.2 Drip Irrigation

Drip Irrigation: the slow and regular application of water, directly to the root zone of plants, through the network of economically designed plastic pipes

- More uniform and higher crop yields
- More efficient use of available water
- Reduced cost for fertilizer
- Reduced labour costs



The experience of GIZ-SLM in Drip Irrigation

Major activities

- Family drip kits were distributed
  - ➔ 27 family drip kits to three project site on Arno, Garno & Gomit - SSI project
  - ➔ 40 family drip kits to 12 woreda- GCCA-E
  - ➔ Family drip kit to 7 woreda – Neibell's initiatives
- Training has been given to farmers, DA, woreda & zonal expert by GIZ-SLM advisor and by Israel expert
- Experience sharing visit was organized for farmers, DA and expert within and outside region as well as abroad

Demonstration on SSI sites

- Agronomic practices applied at the demonstration plots (e.g. fertilizer, improved variety of seeds)
- Each plot was irrigated as per CWR and irrigation scheduling based on crop type, soil type and climate

Month		Nov	Dec	Jan	Feb	Mar
Volume of water needed for one application (within two days)	liter	709	981	1336	1469	1256
No of filling the 0.5 m^3 tank for one application (within two days)		1.42	1.96	2.67	2.94	2.51
No of filling the 0.5 m^3 tank for one application (within two days)		**1.50**	**2.00**	**2.75**	**3.00**	**2.50**
Total volume of water applied in irrigation season (Lit)						**80625**

Family drip demonstration in Arno sites

The best equipment & the most expensive irrigation system, will fail to provide successful irrigation if the IRR. Scheduling (when & how much to irrigate) is wrong

Family drip demonstration in Gomit sites

Drip irrigation and modified rope and washer pump

Practical training on drip irrigation by Israel expert

Experience sharing on farmer field day in Aron site

4. CHALLENGES

Technical

- Inadequate technical capacity at the field level for guiding farmers in proper Irrigation Water Management

  There is a general tendency by the farmers to over- irrigate as a result of their perception of CWR

- Clogging of emitters

  the source of water used for drip irrigation in most of SSI sites either canal water from rivers or dams & the silt load cannot fully handled by the screen/disc filter of FDK

- Siltation of WHP

  the WHP was constructed without silt trap or runoff was collected from untreated catchment

Challenges

Environmental

- Decline the flow regime in contrary to an increase in demand of water from time to time
  - the irrigated area in some of the scheme was stretched more than the capacity of water source
  - This lead to an increase in irrigation interval
  - This in turn make it difficult to irrigate vegetables and other crops which require short irrigation interval beside reducing the productivity of crop

Environmental cont'd

- Damage of plastic sheets (geo membrane) by rats
- Spread of malaria in the stored water
- Drip systems are also exposed to damage by rodents or other animals

Challenges

Institutional/ social/

- There is no protection and regular maintenance of implemented in situ soil moisture activities by land users
- Destruction of in-situ moisture harvesting structures by livestock trampling and during farming operations
- The WUA doesn’t have the required technical and financial capacity to govern the scheme properly
- Farmers perceive that the area occupied by pond was large

Challenges cont'd

Economical

- The initial cost of drip irrigation systems can be higher than other systems

5. RECCOMENDATION

- Strong extension service should be given to the farmers on irrigation water mgt (CRW, IR & water application method)
- Additional water source should be developed to supplement the scheme in a condition where the area irrigated was more than the capacity of the water source
  - ➔ constructing individual water storage at farm level
  - ➔ develop water well to tap shallow ground water
- Operation & regulation practice of the existing system should be adjusted to accommodate new use/condition

  Increase irrigation hour, enforcing fee for water, try to avoid crop which require high water……

Recommendation cont'd…….

- WUA/cooperatives should be strengthened technically & financially to govern the scheme in a better way
- Emphasis should be given to watershed management in order to improve the flow regime of the river/streams
- Attention should be given to the quality while constructing WHP
- Institutions responsible to deliver technical, financial and managerial support should be strengthened
- Since drip irrigation is not familiar to most of farmers, capacity building activities should be done before the implementation

Every drop counts!

More crop per drop!

Thank you