



# Documenting Best Practices Of Global Environment Facility Funded Projects In Ethiopia

UNDP ETHIOPIA 2016

#### Acknowledgment

This document has been prepared by Nicholas Molyneux for the UNDP Ethiopia Country Office under the guidance and supervision of

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A special thanks goes to all of the project staff especially Mr. Debela Tesfaye, Mr. Arega Mekonnen, Mr. Debella Berssissa and Mr. Girma Workie.

All photographs by Nicholas Molyneux

Chapter 5 - UNDP Ethiopia

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## What Is A Best Practice?

Based on UNDP Sub-Regional Resource Facilities' "Guidelines Identifying or Certifying 'Best Practice' or Comparative Experience" this report documents and assesses activities and methodologies undertaken by UNDP-GEF projects over the past seven years.

According to the Guidelines there are Three main sets of criteria with which to evaluate Best Practices, focusing on design, implementation and results, with each set having a number of specific standards that should be met. For example:

### Design

Has the context been thoroughly examined?

Has it been designed in a participative manner?

Using these guidelines and focusing specifically on whether the practices are:

- Replicable
- Cost effective
- Participatory
- In line with government strategy
- Gender sensitive
- Sustainable

### Implementation

Have the activities been well managed, have there been regular meetings, have monitoring and evaluation exercises been carried out?

### Results

Has it achieved attitudinal change? Are results objectively verifiable? and has self-reliance been strengthened?

It was possible to determine which practices should be considered Best Practices and highlighted for upscaling and repetition.

### Importance

A successful experience deserves to be shared. Where activities, through exemplary elements of their design, implementation and outcomes have generated positive change, the practices which led to their successes deserve to be investigated and understood. Once they are understood they can be catalogued, disseminated and adopted in order for those successes to be replicated.

The following chapters highlight and describe the best practices which have been identified in four Government of Ethiopia/ UNDP implemented, GEF financed projects on Ethiopia. sustainable development of the protected area system in Ethiopia (SDPASE).

# 1

## Background

What is a best practice?  
How do we measure it?  
Why does it matter?



# 2

## Sustainable development of the protected area system of Ethiopia (SDPASE)

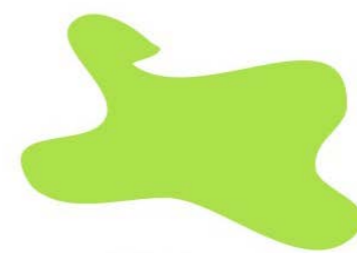
Implemented by: Ethiopian Wildlife Conservation Authority (EWCA)

Financed by: Global Environment Facility (GEF) and United Nations Development Programme (UNDP); Ethiopian Government in-kind Contributions; national and international institutions as co-financiers 2008 to 2016

## Background

Ethiopia has more than 30 national parks, wildlife reserves, controlled hunting areas and wildlife sanctuaries. It is home to over 6,000 species of plant, many of which have yet to be scientifically documented, more than 860 bird species and 279 species of mammal, of which 16 and 35 are endemic respectively. The country is also home to important populations of elephants and lions. Officially, Ethiopia's protected areas cover 14 per cent of the country.

In the recent past, biodiversity in many of Ethiopia's protected areas has declined as their ecosystems have been exposed to intensive livestock grazing, agricultural activity and the establishment and expansion of settlements. A lack of effective protection for areas of high biodiversity and ecological importance has resulted in widespread environmental degradation, threatening the existence of many species of animals and plants.



30 Zones



6,000 Plants



14%

Parks and Reserves



860 Birds



279 Mammals



## Objective of the Project

To emplace “Enabling frameworks and capacities for managing the system of protected areas that have biodiversity, ecosystem and ecological process conservation as major objectives” and thereby safeguard Ethiopia’s biodiversity, ecosystems and ecological processes from adverse human influence through promoting, establishing and supporting improved policies, governance systems, management practices and institutional capacities.

### Results achieved so far include:

- Political awareness and understanding of the importance of the protected areas for Ethiopia has been enhanced through a gap analysis of protected areas system, covering policy, institutional capacity, management systems and enforcement.
- The re-demarcation of the EWCA’s protected areas.
- Development of maps and a GIS system.
- Wildlife management activities, such as aerial population counts.
- Training for 900 protected area employees (scouts) using teaching materials developed by the project. These materials include special training in areas such as the management of wildlife populations and protected areas, wildlife tracking and handling weapons. As a result, the protected areas are now being managed more effectively and more sustainably.
- Procurement of essential field equipment for the employees of the protected areas, i.e. radio equipment for communication within the park areas and game wardens’ uniforms. These give the staff added authority and enable the parks to be properly guarded against illegal activities.
- Studies conducted addressing: the economic value of the Protected Area

System; carbon sink value; gaps in the cataloguing of the country’s species diversity; marketing of wildlife parks, and the legal framework for wildlife management.

The following pages detail the best practice activities and methodologies that became evident through stakeholder interviews, desk based literature reviews and data analysis of the project’s interventions so far.

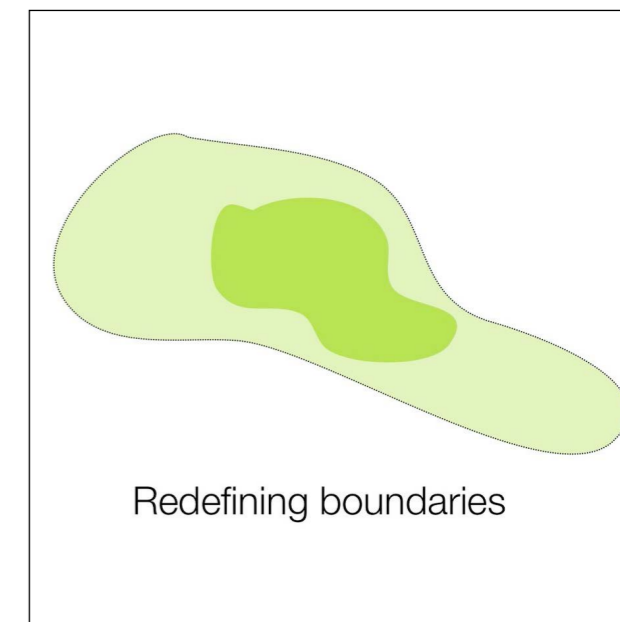
## Best Practice 1

### Re-demarcation of protected areas

While the historical establishment of parks provided an important foundation on which the modern system of protected areas has been built, the original boundaries, delineated in a disjointed and haphazard fashion over the last half-century fall far short of ensuring that important ecosystems and centers of biodiversity are adequately identified and protected.

A pertinent example of this was the establishment of The Simien Mountains National Park in 1969, which was one of the first examples in Ethiopia of efforts directed towards protecting natural areas from human activities and providing a sanctuary for wildlife and biodiversity. It was also one of the first sites globally to be classified as a world heritage Site by UNESCO. However at the time of establishment, the science behind defining which areas should be protected and why was not well understood, resulting in a deficiency in biodiversity protection measures and the founding of unclear grazing boundaries.

These planning shortfalls, replicated across the country have enabled the continued over-utilization of ecologically important areas for pastoral and agricultural activities. The over-



Redefining boundaries

usage has led to serious land degradation which is threatening Ethiopia’s biodiversity and in the case of the Simien National Park has ultimately resulted in UNESCO adding the park to the list of world heritage sites in danger.

In order to rectify these and other issues experienced across protected area sites in Ethiopia, the GoE, in partnership with UNDP carried out a process which should be recognized as a best practice due to its efficacy, reproducibility and participatory nature. The process was extensive, inclusive and thorough; below is a synthesis of the

methodology that was put in to practice in order to attain sustainable results.

**An ecosystem assessment** – a nationwide study using ecological parameters to identify which areas should be included in the new park boundaries, based on rigorous ecosystem assessments by a team of experts.

**A Socioeconomic assessment** – identifying the links between local communities' livelihoods and natural resource through a nationwide study by a team of experts.

These two assessments resulted in a revised set of area boundaries which could be justified based on strong scientific, empirical evidence. The new boundaries were then presented as the optimum ideal demarcation according to best scientific understanding.

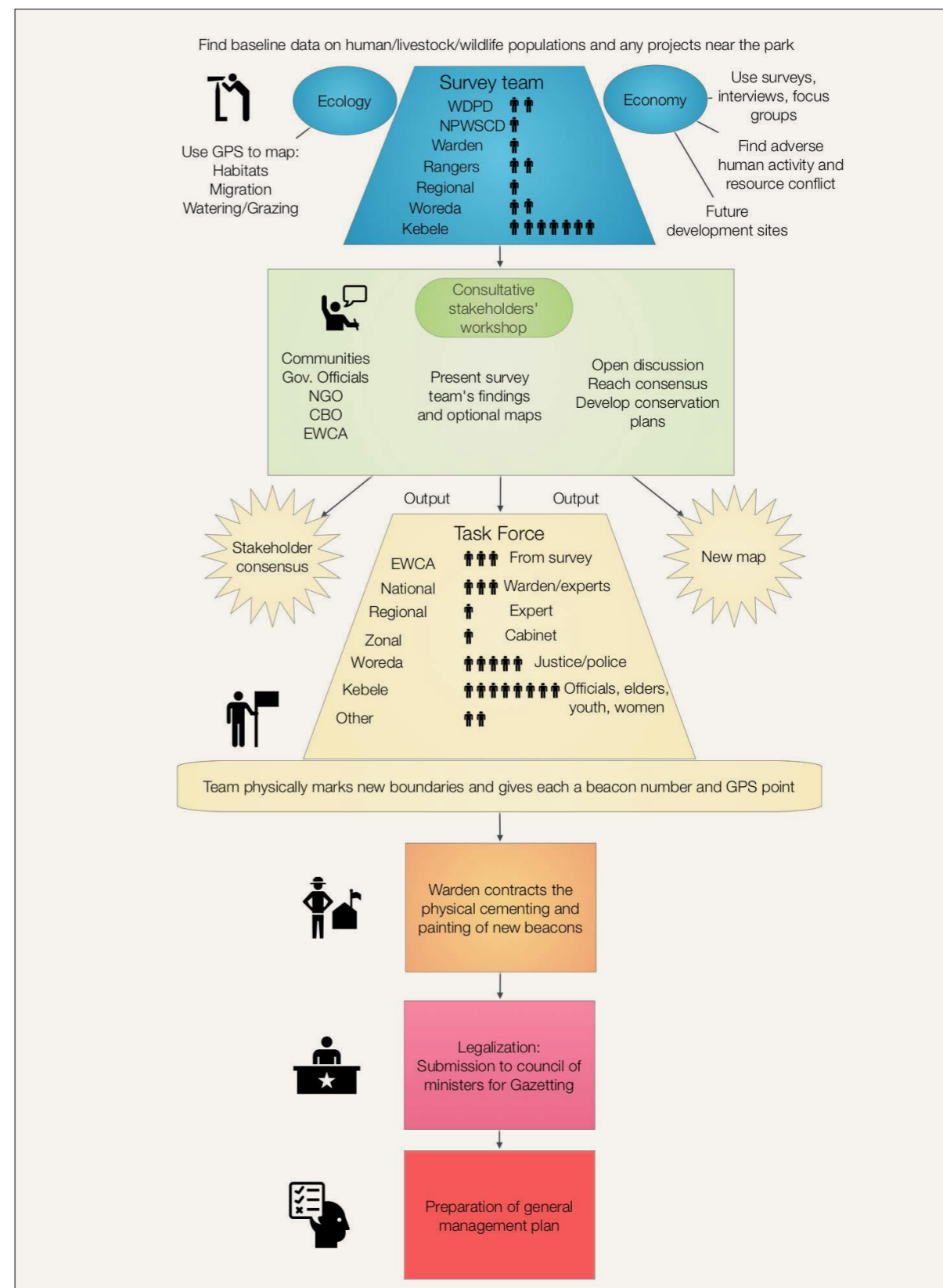
In order demarcate the new boundaries, the project recognised that a compromise between a scientifically ideal boundaries and the preferences of the community would need to be made boundaries, the project recognized that compromise between scientifically ideal boundaries and community-based preferences would need to be made in order to achieve consensus and by-in from all stakeholders and beneficiaries. The project undertook a number of awareness and ownership focused activities which included:

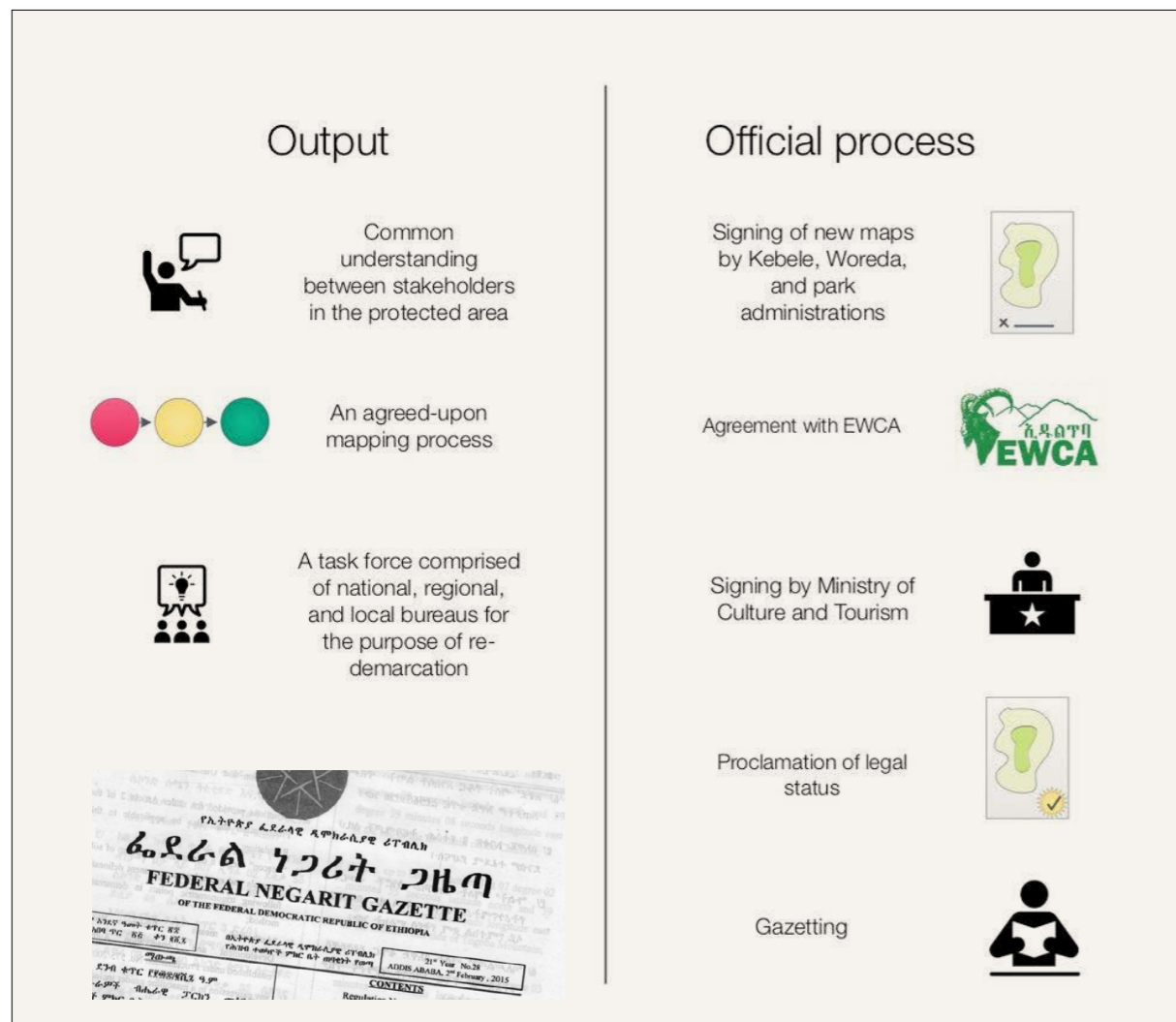
**Raise awareness** among policy makers and directors at national level to encourage greater interest in national parks and understanding of their role in Ethiopia's sustainable economic development, particularly in supporting the climate resilient green economy agenda.

**Capacity building** of regional policy makers and line agents who will be directly managing the newly established parks. Workshops helped introduce the benefits and responsibilities of protected areas and also allowed the relevant authorities to provide input into demarcation of park boundaries. .

**Participatory planning** at the community level gives communities the right to re-describe the scientifically identified boundaries along different paths to include or exclude areas of particular interest or economic or social importance. This approach leads to greater stakeholder consensus and creation of a new map.

**Inclusive re-demarcation** is a process that all actors are involved in the physical act of setting beacons and marking boundaries prior to official gazetting.





1. Build common understanding among stakeholders regarding problems in the protected area then formulate a way forward.
2. Agree on the new areas and boundaries.
3. Form a task force with representatives from EWCA, and woreda and kebele councils.

**Once this has been completed it moves forward towards legal establishment:**

1. Signage of new maps by kebele, woreda and park administration.
2. Agreement with EWCA.
3. Signage by Ministry of Culture and Tourism.
4. Proclamation of legal status.
5. Publication.



**Dejen Gestie, 34,**

was born and raised in the Simien Mountains National Park. His family has lived there for generations. Now he is the head of a local guide association

“Six or seven years ago my association had no more

than 25 people, now there are 68 members and for the first time three of them are women. Other groups such as the chefs association are also growing; before there were about 15-20, now there are over 70. There are also many other associations [related to tourism] benefitting from the park.

All the people working in association in the Simien Mountains are from the Simien Mountains. We have received trainings that have improved our ability to provide guide services, but we want more trainings. The park is providing a future for the people of this area. If you compare this town (Debart) with Dabat which is further away from the park, you can see how much we are benefitting. 10

years ago Dabat was ‘the big town’, if you wanted to go to a bank you had to go there...now the banks are here, the hotels are here, and this is all because of the park.

The communities who live in the park and the buffer-zones around the park understand the benefits of the park. The grazed land in the park is degraded and does not provide them with a good livelihood. The new livelihood opportunities that tourism bring is providing [the young men and women] from these communities with new sustainable job opportunities which gives them a much better future. Some people are now guides, while others are wardens, provide camping equipment or mules for hikers or produce local handicrafts for sell to tourists. I am from here and i can tell you that this park is good for us, for all of us...”



## Best Practice 2

### Raising Awareness and Promotion Strategy

The project has managed to raise the awareness of Ethiopia's policy makers, administrators and natural resource users towards a deeper understanding, appreciation and regard for the importance of protected areas.

The strategy was multi-faceted, with each activity strengthening the overarching umbrella of increased awareness and understanding. This leads to a number of outcomes, which together provide the foundation for an effective and sustainable protected area system. This overall strategy fulfills the requirement of a best practice and could be replicated in similar situations.

### Activity 1) Policy Gap Analysis

InAn analysis of Ethiopia's legal, institutional and policy frameworks as they relate to the management of wildlife resources was conducted in order to understand how the SDPASE

project could best address any gaps in awareness, knowledge and understanding of the role of protected areas, and thereby best assist the GoE in developing their protected area system. Policy, institution and legal frameworks were mapped out and critically discussed following which protected areas awareness, promotion and policy building strategies were developed.

### Activity 2) Assessment of the Value of the Protected area System of Ethiopia:

#### Making the Economic case

During the design phase of the project a disconnect was identified between Ethiopia's protected area system and its economic development strategy– the value of protected areas and the ecosystem services they provide was unknown and unrecognized as an integral part of Ethiopia's natural resource base.

#### In order to address this the SPDASE project undertook:

- A. financial analysis of EWCA - using the undp financial sustainability scorecard
  - B. economic analysis of the value of economic benefits/indicators at the national and case study levels using wwf's protected areas benefits assessment tool (PA-BAT)
- As a result the project was able to:**
- C. Identify and document financial arguments to solicit for increased funding levels for the Protected Area System
  - D. Identify and document arguments for mainstreaming the PA system into the broader development context (in particular in the pro-poor development agendas

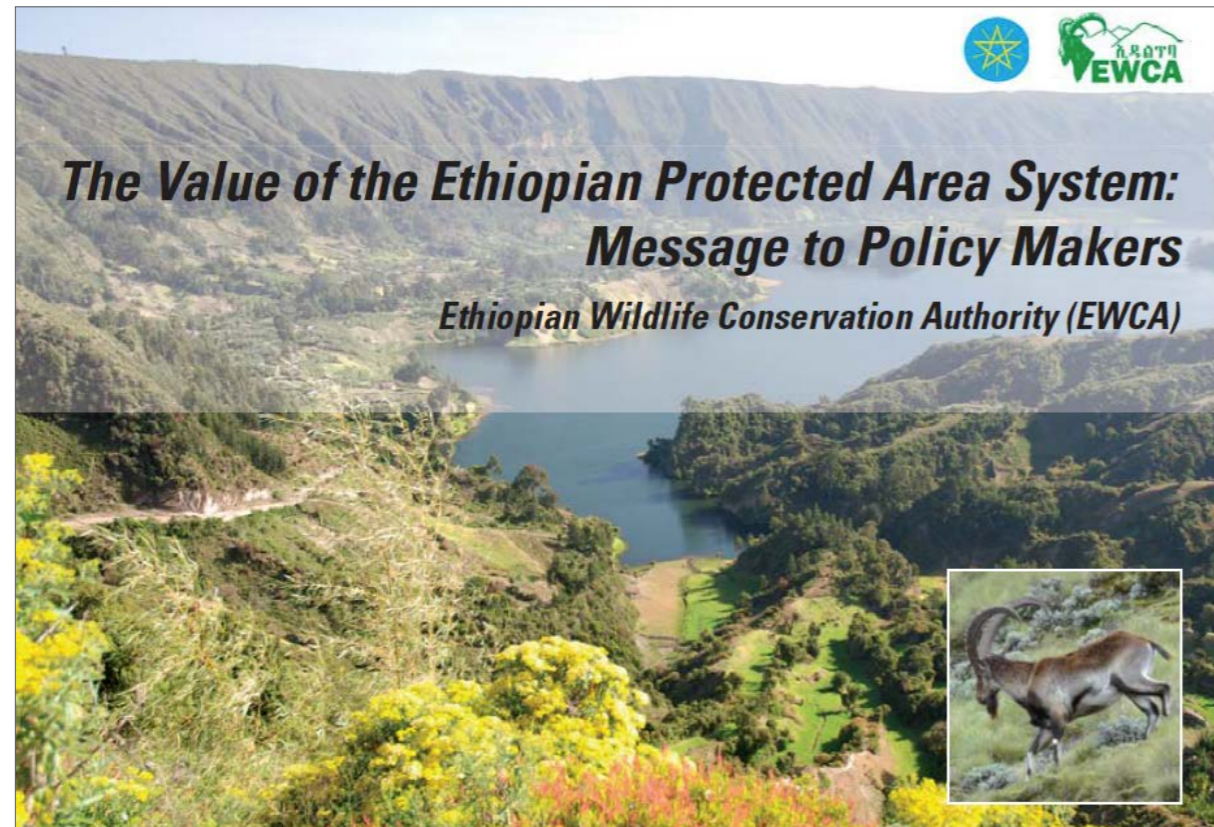
Economic Value	Us\$ Million/Annum
Watershed protection	432
Carbon Stocks	19
Biodiversity	3.75 to 112
Medicinal plants	13
Genetic resources	420
Cost of deforestation	20

Figure 1. Assessment Of The Value Of The Protected Area System Of Ethiopia, Making The Economic Case – UNDP OBF, 2010.

### In line with Government strategies - Fighting Poverty

The GoE's Plan for Accelerated and Sustained Development to End Poverty (PASDEP) outlines Ethiopia's pro-poor development agenda and provides the basis for mainstreaming Ethiopia's protected areas system into the broader development context. The PASDEP recognizes the linkage between environmental degradation and poverty levels and focuses on the conservation of natural resources, including water soil and energy.





Activity 2 output - A policy brief document targeting policy makers helped to highlight and explain the value of protected areas for Ethiopia's development agenda and national budget.

### Activity 3) Exposing decision makers to international examples

In order to ensure greater understanding and build PA-based momentum within government, policy makers, parliamentarians and regional administrators were exposed to functioning protected area systems and strategies in other African countries.

The Ethiopian change-agents were given tours of national parks and protected areas that would showcase the potential for improved protected area policy and management in Ethiopia.



### Activity 4) Biodiversity gap analysis

The analysis helps to systematically fill the knowledge gaps relating to biodiversity by scientifically examining and identifying missing areas to be addressed in order to complete the cataloging of Ethiopia's protected areas system.

Evaluation Criteria:

Area size	Ecosystems	Species of Special Concern	Economically exploited watersheds	Tourism value
Scenic landscapes	Extraordinary Geomorphology	Cultural, archaeological and palaeontological sites	Special research potential	Carbon content and sequestration potential

### Activity 5) Public relations campaigns

In order to familiarize the public and change agents in government and civil society, a public awareness campaign was launched which included:

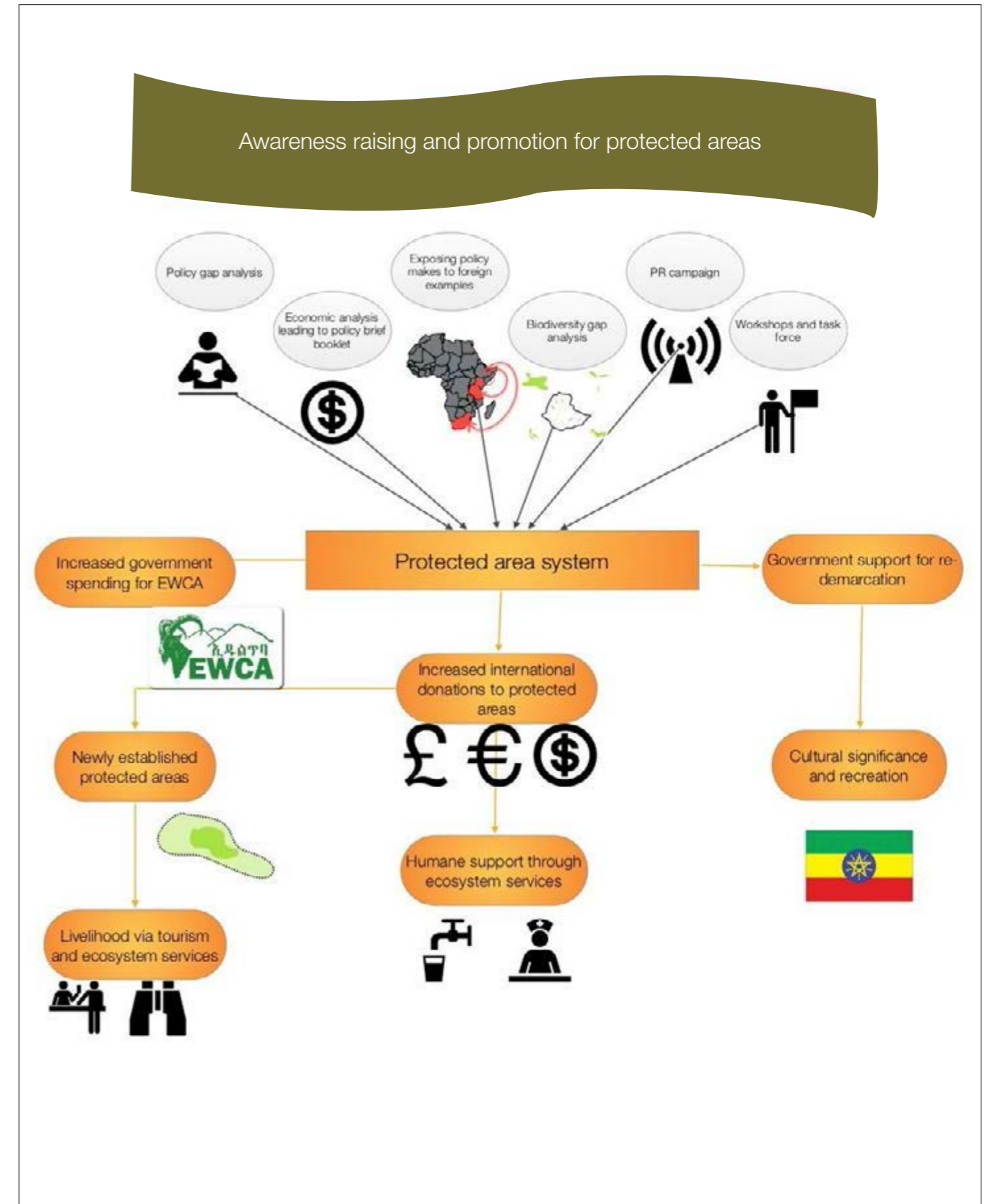
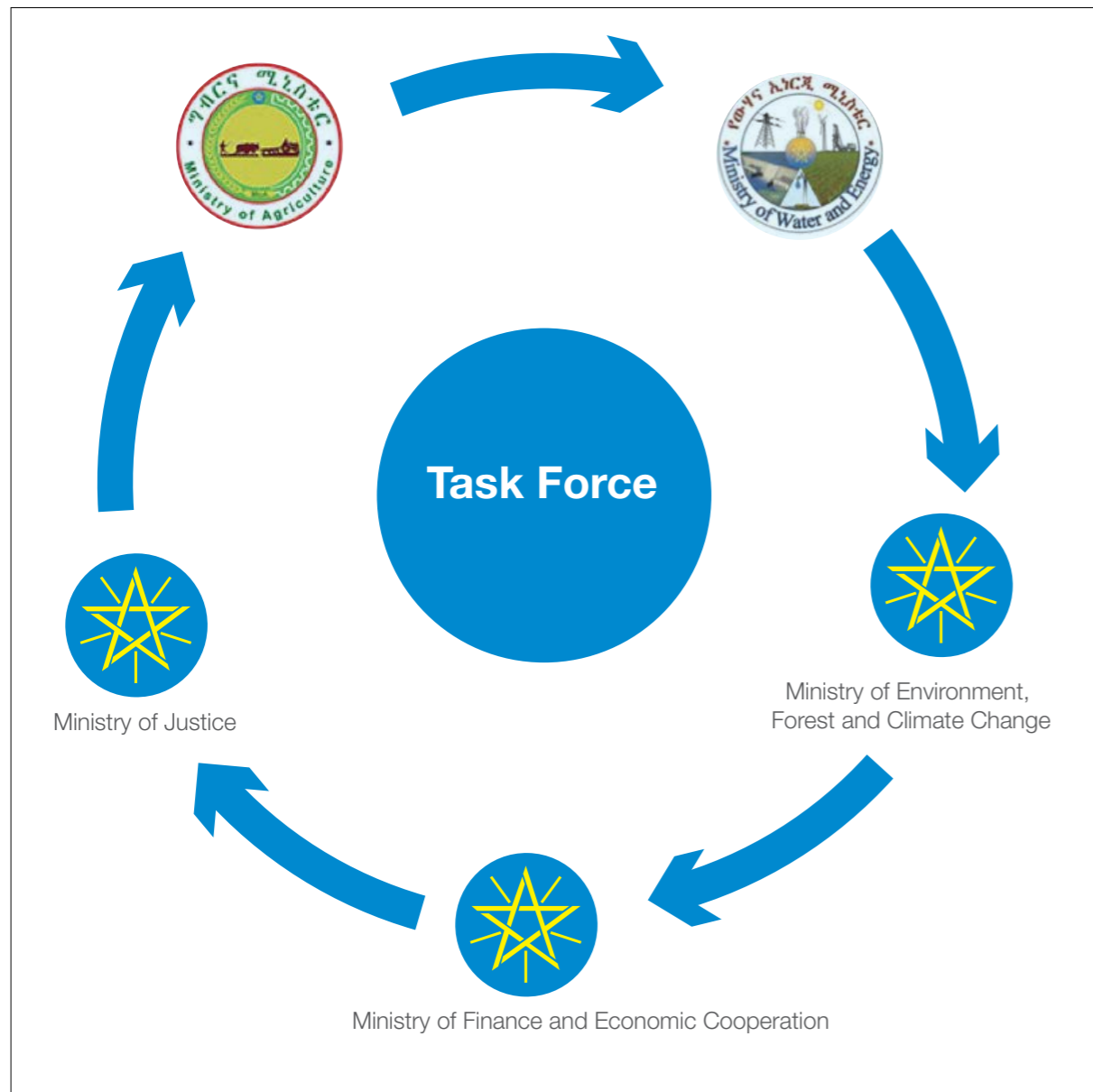
- film documentary)
- Radio
- Televised programming
- Printed media
- Merchandising

### Activity 6) Workshops, trainings and taskforce

Workshops were conducted to local and build the knowledge and awareness of local and regional administrators as well as present the findings of the above activities developed and funded by the SDPASE project. Workshops participants were drawn from a wide range of relevant public sector agencies to ensure increased cross-the-board

awareness of the importance of protected areas.

A national taskforce for wildlife management was set up comprising members “Before the park was re-demarcated this area was full of people cutting trees, disregarding the environment and even stealing from one-another...after demarcation we were



organized into a bee keeping group, we became aware that this area is our land to look after, that it belongs to us.

Before the park was re-demarcated this area was full of people cutting trees, disregarding the environment and even stealing from one another. After demarcation we were organized into a bee keeping group, we became aware that this area is our land to look after, that it belongs to us.

We are just starting to produce honey from our bees, and even though we aren't making good money yet we believe that in the future we will benefit from protecting our area. We even plan to open a tej (honey drink) shop and be a successful example to the next generation."

Honey production cooperative members,  
**Simien National Park**

The GEF funded Small Grant Program in and around the Simien National Park has targeted activities which provide alternative livelihoods for communities who have traditionally relied on the park area's natural resources,

Other SGP activities include bread making, biogas production and cattle and sheep fattening.

"before we would go to the park and collect fire wood, but it was dangerous, there was the risk of being attacked by both people and animals. Now, through support from the SGP we have formed a bread baking group, are baking 1-2000 loaves per day, selling to hotels and restaurants and making more money than we ever did collecting fuel wood. I believe the future for our community is tourism, already we are feeling the difference..."

Bread making group,  
**Simien National Park**



"...the local breeds are not productive; if we talk about milk, they don't have milk, if we talk about meat they don't have meat, but these ones [SGP funded imported sheep breed] are very good and productive in these respects..."

Sheep fattening and multiplication group,  
**Simien National Park**

## 3

## Mainstreaming Agrobiodiversity

Farming communities are provided with policies, capacity, markets and knowledge as incentives to mainstream conservation of agro-biodiversity, including crop wild relatives into Ethiopia's farming systems.

## Background

Ethiopia is recognized as a centre of agro-biodiversity, designated as one of eight Vavilov Centers around the World (original centers for the domestication of crops). The Ethiopian population has been actively engaged over the millennia in crop domestication and hybridization efforts to suit local tastes and deal with the vagaries of climate and geo-physical conditions. The country harbors important gene pools of crop wild relatives (CWR) for at least 197 species of crops, including grains, pulses, oil seeds, vegetables, tubers, fruits, spices, stimulants, fibers, dyes and medicinal plants.

Despite its national and international importance, Ethiopia's agrobiodiversity is highly threatened by environmental degradation, which poses a serious challenge to the development potential of the country. The key challenges are land degradation, deforestation, habitat conversion and the consequent loss of "wildlands" which harbor wild relatives, and the replacement of landraces and farmer varieties (FV) with hybrid high yielding varieties (HYV). One of the greatest risks to the rich diversity of Ethiopia's crop wild relatives is the loss of natural habitats as a result of deforestation, change of land use and human encroachment.

Focusing on locally adapted traditional agriculture systems, the project seeks provide farming communities with incentives (policies, capacity, markets and knowledge) to mainstream conservation of agro-biodiversity,

including crop wild relatives into the farming systems of Ethiopia in order to halt genetic erosion (disappearance of landraces and farmer's varieties) and to secure genetic diversity in food crops.

### Key Innovations of the project

- Developing marketing strategies – market access, product improvement and market creation
- Certification and promotion
- Payment for ecosystem Services
- Bylaws and policies
- Extension packages for farmer's variety crops
- Climate Change adaptation through on farm diversity and gene banks

The following pages provide a background to the four farmer variety crops that the MAB project has focused on and describes the identification of barriers to their sustainability, as well as the proactive responses developed to tangibly improve the marketing and production viability of farmers' varieties. This is especially important given the increasing pressure faced by the farming community to switch to genetically more homogenous cultivars as well as the challenging climatic conditions.



## Enset

Enset has been farmed in the southwestern highlands of Ethiopia (1500 – 3100m) for hundreds, probably thousands of years. It is cultivated vegetatively and is highly resilient to rainfall fluctuations. Enset is a perennial carbohydrate crop with a high calorific value per hectare, meaning that it is highly adept at providing an emergency food-energy safety net and can support high population densities.

Enset provides the main carbohydrate staple for over 8 million people and is an important dietary component for many more. While traditionally not a cash crop itself, through consumption of enset, households which intercrop with maize are more often able to better capitalize on maize's higher market value and thereby generate important household income.

Despite these attributes, enset has received little in the way of agricultural outreach support, and its distribution and dominance at the household-production level have fallen due to cereal crop substitution

### Some of the challenges associated with enset cultivation and utilization as a food include:

- Inefficient post harvest processing - labour intensive
- Lack of extension services/ agronomic knowledge to optimize production
- Poor market chain structure, and
- Weak market for byproducts

value and thereby generate important household income.



## Forest Coffee

Arabica coffee is indigenous to the Afromontane archipelago forest area of Ethiopia's south and southwestern highlands and it plays an important role in Ethiopia's and global food commodity economies. Wild Arabica coffee continues to grow and regenerate naturally in these forests and has maintained a genetically different make-up from domesticated commercial cultivars. The coffee grows in the undergrowth of the montane rainforests at altitudes between 1,000 and 2,100m above sea level.

Ethiopia is currently thought to be home to approximately 1200 - 1600 genetically distinguishable landraces of Coffea Arabica. Maintaining and protecting genetic diversity of such an important global food-crop safeguards it from disease and pests, and

also plays an important role in the development of new cultivars that are resistant to future pressures from climate change.

Of specific relevance to the project is the Yayu biosphere located in the Ilu Abba Bora Zone of the Oromia Regional State. Yayu Biosphere is a center of coffee diversity of global importance and was declared a biosphere reserve by UNESCO in 2010.

However due to very little financial assistance available to forest coffee farmers, from private or government channels, there is a deficit of modern agronomic understanding and still today the industry relies only on traditional knowledge, basic harvesting practices and benefits from little value adding and marketing. Because of this forest coffee and wild varieties are under performing and are under threat from land encroachment, competing cultivars and deforestation.

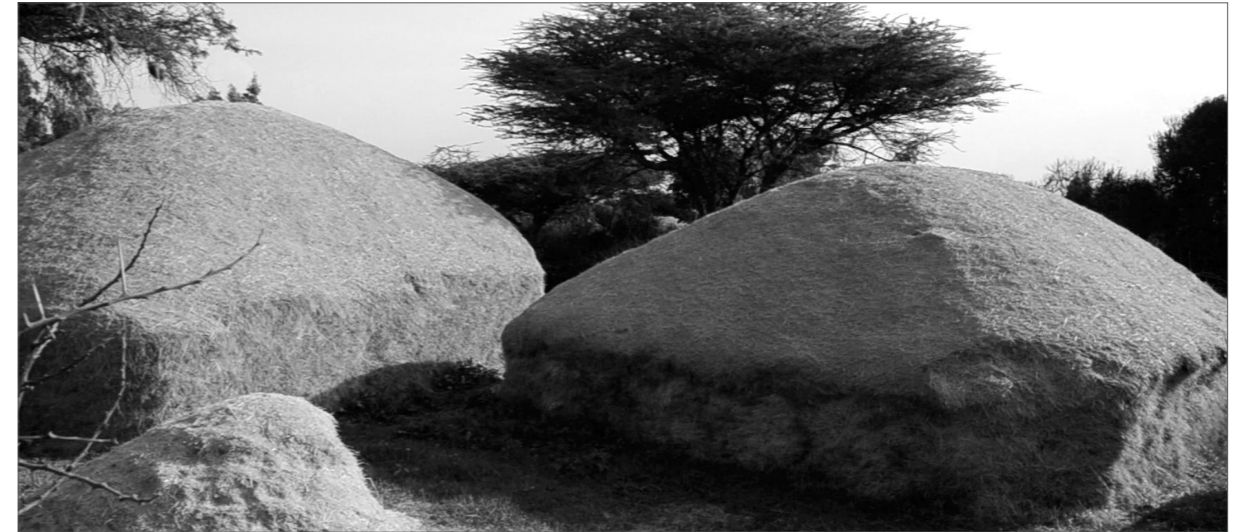
- Lack of investment
- Lack of extension packages
- Poor post-harvest processing and value adding
- Weak branding

The above issues had led to a situation where, prior to the project, coffee beans harvested from the Yayu area were not only undervalued but were actually de-valued due to poor collection methods resulting in soiling of the beans.

Through the MAB project's guidance and support, Yayu Forest Coffee has been able to establish itself as an independent coffee brand. The Yayu forest coffee has been certified by the Rainforest Alliance and now demands a premium price based on its unique origin and management status.



By ensuring adherence to the Rainforest Alliance's requirement for certification, the project has helped raise the profile of the Yayu Biosphere forest coffee. This has also provided protection and investment incentives at the community, local, regional and national levels.



## Teff

Teff (*Eragrostis tef*) is a very important tiny grained cereal crop that originates in Ethiopia. Teff is eaten by most of Ethiopia's over 90 million inhabitants in the form of injera, a flat pancake type of food that can be dipped and used to pick up morsels of vegetable and meat dishes. The straw byproduct of teff is also important as a building material and animal fodder.

Some attributes of teff are:

- Drought and water-logging resistant compared to similar cereals
- Can be intercropped and relay cropped
- Building and cattle feed uses
- Resilient to pest and disease
- Easily stored ( up to 3-5 years without deterioration)
- High market value

### Issues to be addressed to increase cultivation of farmers' varieties and maintain genetic diversity in teff:

- Farmer's varieties of teff are not adequately supported, resulting in a trend towards farmers abandoning local cultivars and instead adopting improved varieties which are promoted by the government and accompanied by extension packages and services.
- Markets for farmers varieties are not developed, which coupled with a slightly lower yields than improved varieties means there is little incentive to cultivate farmers varieties.
- Market preference for white teff, whereas many farmers' varieties are darker grains or multi-coloured.



## Durum Wheat

Durum wheat (*Triticum durum*), a domesticated species, is thought to originate from Ethiopia either as its primary gene base or at least as a secondary area of genetic diversification. Ethiopia therefore holds a vast and important portion of the global genetic diversity of durum wheat making it important for industrial wheat breeding programs, in which genetic variability is relatively low.

Wheat is the staple food for a third of the world, providing more calories and protein in people's diets than any other crop.

Due to the success of breeding programs over the last half century, the diversity of well-adapted local landraces and cultivars has been replaced by considerably smaller number of modern cultivars with low variability. The repercussions of this is that the homogenous, ubiquitous high-yield varieties are at higher risk from shock events for which they have not been developed, and lack the diversity necessary for further improvement of quality and yield.

In addition to hosting a natural hotspot of genetic diversity for durum wheat, Ethiopian farmers have until recently been relatively untouched by the green revolution and have therefore continued to use landraces. As a result of this, Ethiopia's durum wheat express traits such as resistances to leaf rust, powdery mildew and glume blotch and phenotypes such as long coleoptile, short culm, early maturity, drought resistance, high protein content, adaptation to low soil fertility and resistance to Hessian fly.

These factors make the Ethiopian durum wheat germplasm extremely interesting for genetic studies and as a source of genes and gene complexes. Therefore, protection of the Ethiopian durum wheat germplasm is important in terms of maintaining local genetic diversity in crops and thus providing local farmers with an autonomous tool for adapting to climate change as well as genetic tools for strengthening global food security programmes.

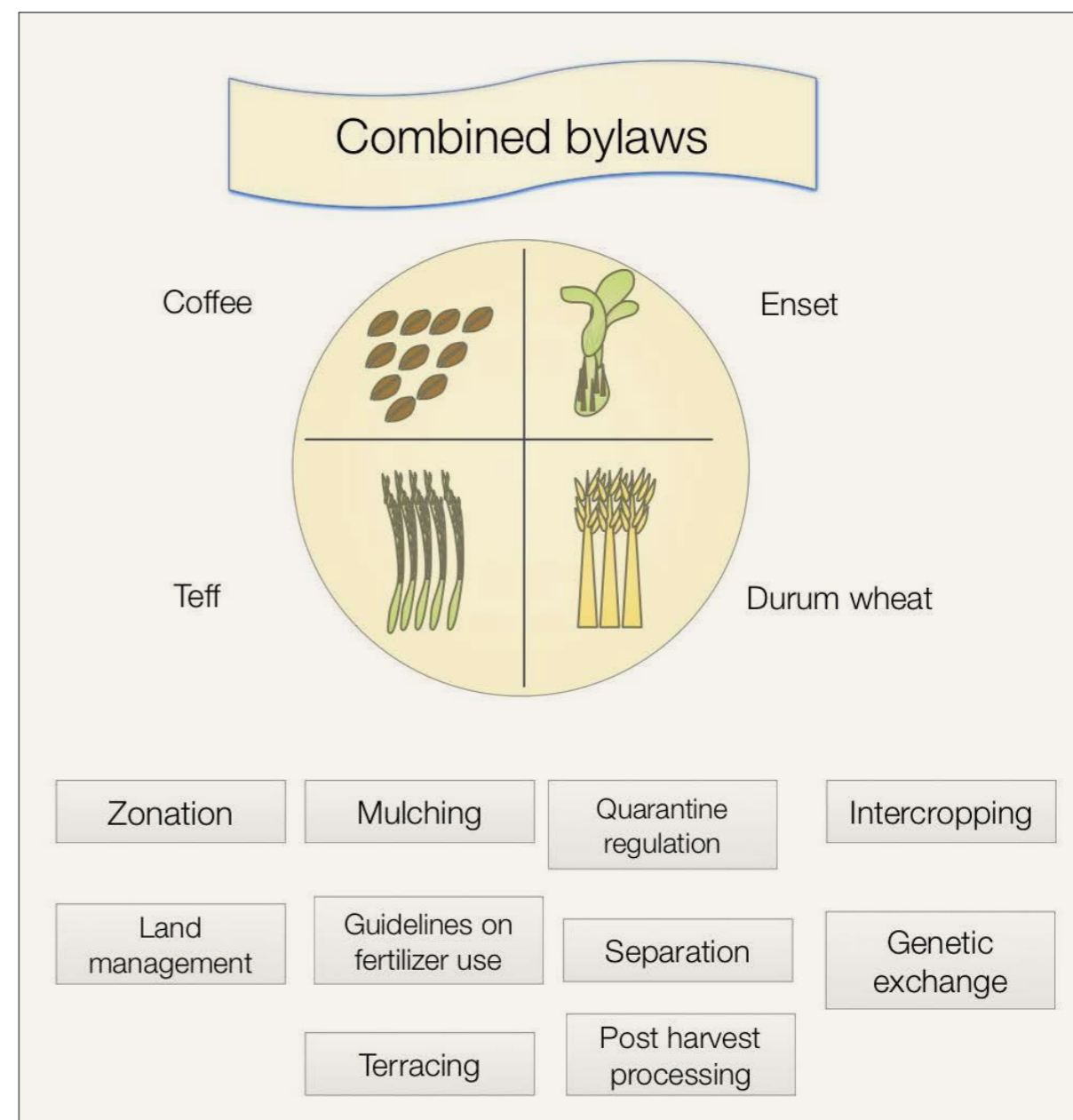
## Best Practice 3

### Development of farmers' variety

**Bylaws**-in order to address many of the issues relating to the how, where and.... and when cultivation of the 4 crops should be done in order to improve yields and maintain genetic diversity, bylaws were developed. The bylaws,

the first of their kind, was tailored to address the needs of each crop and individual community in which the crop was being grown.

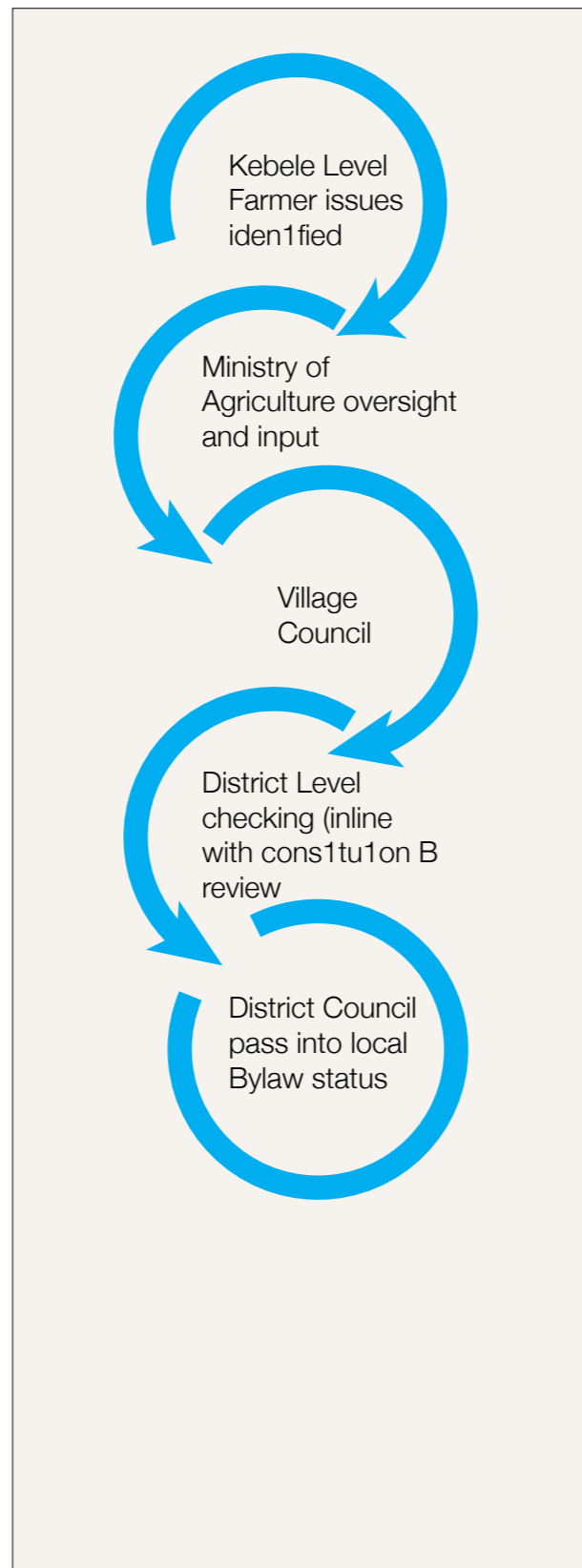
Through employing a combination of traditional knowledge and scientific best practice, Farmers' Variety bylaws have been created that understand the farming context



from both the local farmers' and crop improvement perspective. During this process the bylaw they were screened for their synergies with national, federal laws and where contravening them, revised. The output of the bylaw process is an improved enabling environment both in terms of farming best practices and strengthened local policy.

The farmers' variety bylaws reinforce and compliment the Federal laws of Ethiopia, particularly in matters of a local nature that are typically hard to police due to their complexity and specificity. The bylaws also serve as a process that reinforces and reiterates the will of a community, refreshing their own aspirations for their own issues, and them formalizing them under an official process. The process of developing these laws for enset and forest coffee, which were managed directly under the MAB project is a best practice initiative that can be showcased to promote higher standards and replicated for other farmers' varieties both in Ethiopia and abroad.

In order to be proclaimed, the bylaws were first discussed and agreed upon by the local community, the Ministry of Agriculture, the kebele (village) and the woreda (district) councils and the house of speakers at the woreda level .



## Enset

The outcome of the enset related bylaws is a more robust enset producing farming community that has an improved ability to sustainably attain greater yields, a greater variety of genes and more added-value food products and byproducts. In doing so the farming community improves their household income, food security and climate resilience status whilst securing the biodiversity future of an important and unique food crop.

The kebele-specific Enset bylaws included rules stipulating and detailing agreed upon agronomic practices in order to reduce and control the spread of infection and also described methodologies that should be utilised to ensure improved yields and promote sustainable soil management.

Details of the bylaw include:

- Pathogen control mechanisms –bacterial infections
- Land preparation – including mulching
- Harvesting techniques
- Post harvest processing
- Byproduct processing for maximization of profits

The MAB project, as part of it's enset focused activities, has supported improved marketing of enset, both in its edible form as well as in the byproduct fiber form. This support has meant that farmers receive greater financial incentives to protect their enset crop diversities and resist land use change towards cereal production,

The project also supported the establishment of a enset cooperatives, which now has 404 members, in order to ensure market efficiency.

## Forest Coffee

Forest coffee bylaws focused on zonation of areas within the biosphere which dictated strict rules for harvesting and coffee tree management.

These including a moratorium on harvesting and pruning inside the core zone and specific rules for collection of coffee beans in zones 1 and 2. Through formulating bylaws through the MAB facilitated process, Yayu Biosphere coffee harvesting communities have been able to place their needs and desires into local law binding laws and in doing so achieve certification and recognition for their unique product.

**The Geechii coffee farmers' cooperative in Yayu Biosphere is a working example of a coffee growing community that has been assisted by the MAB project to develop local bylaws. Through this support local knowledge and understanding has been strengthened and traditional jurisdiction reinforced with regards to best practices in coffee farming and land management.**

As dictated in the bylaws, specific techniques should be used in order to attain high quality products that can demand a high market price. The MAB project provides the



community with training, tools and technologies with which to improve their bylaw development capacities. Communities are also supported with their harvesting and post-harvest activities and needs, such as moisture testers, coffee drying equipment, packaging/ sacking, weighing devices and safety boxes.

The MAB has established five cooperatives that have developed their own specific bylaws, unique and specific to the needs of their individual communities.

Examples of regulations stipulated through local coffee farming community bylaws:

- Springs are to be protected by a 50m radius buffer zone, within which there will be no farming, construction or tree felling activities
- Terraces will be constructed using local appropriate species in order to manage slopes and promote soil stabilization and water conservation

**Through adhering to bylaws, coffee growing communities are able to systemize, improve and sustain their land management, production and post harvest techniques, thereby enabling them to attain brand status and receive internationally recognized certification.**

## Best Practice 4

### Marketing Enset Example

The MAB project’s farmers varieties-focused activities is ensuring that farmers improve the marketing of enset, durum wheat, teff and forest coffee, both in their edible forms as well as their byproducts. This has meant that farmers now have greater financial incentives to protect their enset crop diversities and resist land use change towards cereal production.

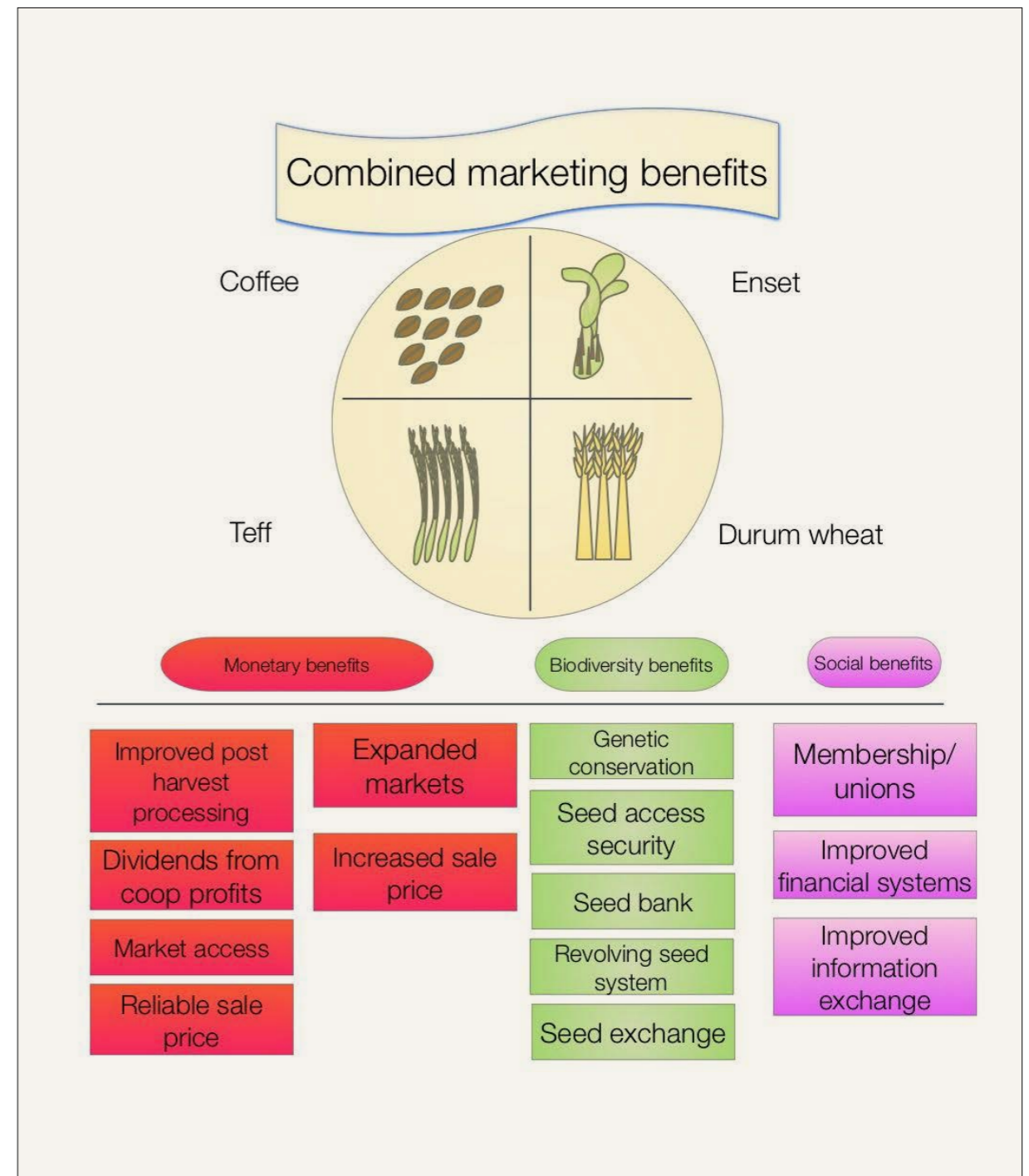
The following pages focus on two of the most successful examples of this which are: forest coffee branding and marketing, and enset byproduct production and market development.

### ENSET- Establishing markets and marketing cooperatives

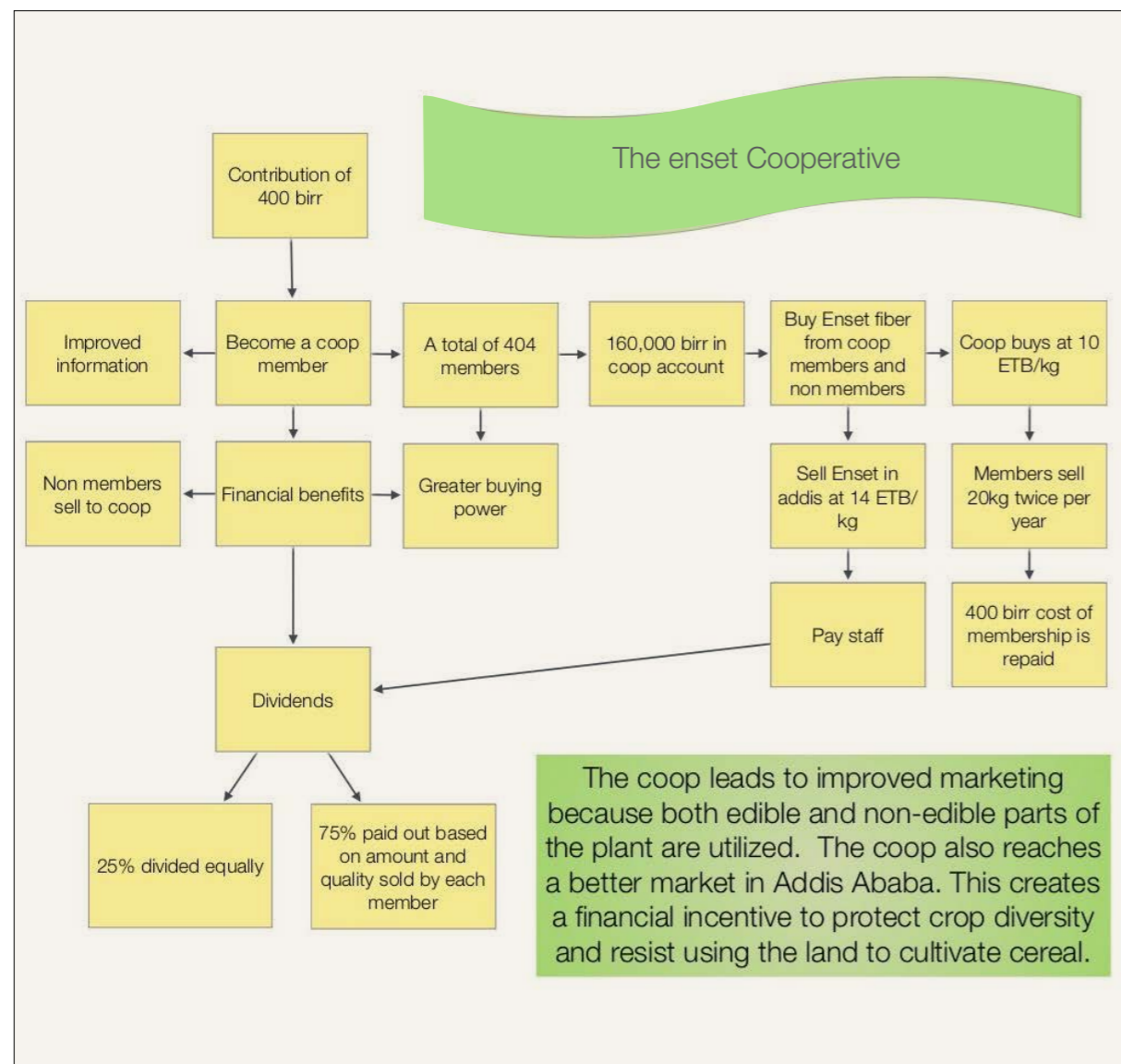
All beneficiary farmers are advised to plant indigenous trees and the disadvantage of deforestation. Accordingly, two indigenous species are introduced and planted in the area.

In order to ensure market efficiency was reached, the project supported the establishment of a enset cooperative which now has 404 members. The advantages of being in the cooperative range from receiving improved market and agronomy information to receiving financial benefits through sales of products.

The cooperative members each contribute 400ETB - the equivalent of approximately \$20 dollars on joining, they are then eligible to obtain higher earnings from dividends based on the cooperative’s profits.



### Cooperative Establishment



The 404 members each contributed 400 ETB 160,000 ETB in total into the Cooperative account

This capital allows the cooperative to purchase fiber from a potential and 10,000 individual producers.

Each producer gets between 7 and 11 ETB per kg depending on quality (length of fiber and whiteness), with an average seller selling approximately 40 kg.

The stock is then sold by the cooperative to a private company in Addis Ababa at approximately 14ETB per kg. The profits of the cooperative are then both invested back into the cooperative and shared amongst the members.

Each member receives an equal dividend of 25% of the profits, while the other 75% is distributed to the members based on their kg contribution and the quality of fiber they sold that year.



**Amarech Teketel**  
member of the Enset Products, Producers and Marketing Association

The current household sale of fiber products to the cooperative is approximately \$40 per year. Prior to MAB establishing the cooperative and introducing mechanisms, the fiber was either discarded or utilized for non-profit making activities such as making rope for household use. With the help of the project, producers now take time to dry and prepare the fiber carefully in order to demand maximum profits at the Marketing association.

“Before the association was formed we didn’t really use our fiber, we didn’t get money for it, but now we do. Today I have sold my fiber for profit. I harvest twice a year in June and in September and I bring my fiber to this organization, this time I only brought about 10kg, and received 100ETB. We don’t only plant enset for fiber though, it is a versatile crop, we get food from it too, we don’t get versatile benefits from potato or wheat. We will never give up planting enset”

## Best Practices Synergies

The marketing strategy of the project has synergy with the bylaw strategy: Improved markets require stable production of enset and increased availability of products for markets. This is achieved through the improved management dictated by the bylaws. In return, farmers have an incentive to observe and follow the rules stipulated in the bylaws due to the added financial benefits provided by the improved ability to sell the products.

In addition, other MAB-based, UNDP-GEF funded activities provide benefits that are in synergy with the best practices and should be considered in future project design and planning, they are:

### Gene banks, on-farm gene banks and botanical gardens

The MAB project has developed a number of locations specifically designed to work with and preserve the great diversity of food crop varieties in Ethiopia in order to secure the future of the diverse range of farmers' varieties of enset, forest coffee, durum wheat and tef. On-farm gene banks (farmer managed), specific specialized gene banks (funded by the project and managed by staff) and botanical gardens (for education, research, conservation and gene storage) have been set up. In the case of gene banks and botanical gardens, the land has been provided by the government as in-kind contribution.

### Extension packages for farmer varieties

Enset farmers were previously not provided with assistance from the government in terms of extension packages from the Ministry of Agriculture. In order to address this the MAB project provided training and consultants which, in conjunction with the MoA, set about improving agronomic practices associated with enset (i.e. improved site selection, land preparation, sowing time, weed control and pests, harvest, post harvest, threshing and storage practices) and producing an extension manual which is now implemented through the MoA.

## 4

## Promoting Autonomous Adaptation

The PAA project, designed to address climate-change related threats identified through the NAPA process, has been implementing activities since 2013. It was designed to align with and compliment Ethiopia's Growth and Transformation Plan (GTP) and to especially support the National Climate Resilient Green Growth Strategy.

### NAPA Priorities in Ethiopia:

- Promoting drought/crop insurance programme in Ethiopia;
- Strengthening/enhancing drought and flood early warning systems in Ethiopia;
- Developing small-scale irrigation and water harvesting schemes in arid, semi-arid, and dry sub-humid areas of Ethiopia;
- Establishing community-based sustainable utilization and management of wetlands in selected parts of Ethiopia;
- Promoting of farm and homestead forestry and agro-forestry practices in arid, semi-arid and dry-sub humid parts of Ethiopia)

Since the beginning of the project all of the planned sub-national level climate resilient plans have been developed and actioned, following-on from which the project has implemented a number of climate risk reducing activities, techniques and practices within the associated woredas and kebeles.

An approach of demonstration, learning and up-scaling was undertaken in order to

ensure ownership and commitment to build resilience,.

The project design also emphasizes the importance of mainstreaming climate change resilience into existing policies and strategies. This required a focus on increasing institutional capacity for cross-sectoral action planning, ensuring that an integrated adaptation response was implemented.

The project has built capacity at sub-national levels to assess, plan and implement integrated programmes of support designed to enable communities to adopt and adapt new risk-reducing and livelihood enhancing technologies and techniques that build their resilience to climate change. Innovative adaptation enhancing techniques and practices, including the better use of local climate information and micro-finance (credit and insurance) have been carried out.

**Outcome 1:** Institutional capacities for coordinated climate-resilient planning and investment strengthened.

**Outcome 2:** Access to technologies and practices that improve the range and efficiency of adaptation options improved.

**Outcome 3:** Capacity for community-based climate change adaptation improved.



## Best Practice 5

### Formalization of The vulnerability assessment and kebele (village) adaptation plan processes

**Specifically addressing Output:** “Training and support provided to eight Kebeles and one city administration to undertake climate vulnerability profiles to identify adaptation priorities and plan accordingly”. The project has focused on assisting communities and the kebeles in which they live in undertaking an assessment for their climate-related vulnerabilities in order to identify the most useful ways in which project activities can target the needs of communities to adapt to climate change.

Prior to all project-led adaptation activity, target kebeles were assessed for their climate vulnerability status, after which an

adaptation plan was created. This process was designed and supported by the PAA project and serves as an excellent example of how to build climate understanding and vulnerability assessment capacity within regional and local government agencies while at the same time generating kebele-specific vulnerability Assessments and Adaptation Plans.

premise and background to Vulnerability Assessment and Adaptation Plan procedures

1. Ownership of the Vulnerability Assessment, Adaptation Plan and resulting activities belongs to the community
2. UNDP identified woredas (district areas) at the PPG stage. Recipient kebeles (villages) identified through government-led selection at the implementation phase

based on criteria such as:

- Natural resource capital (land, forest, water/rain) and degradation
- Physical capital (agricultural resources)
- Vulnerability
- Accessibility
- Food insecurity
- Lack of prior assistance

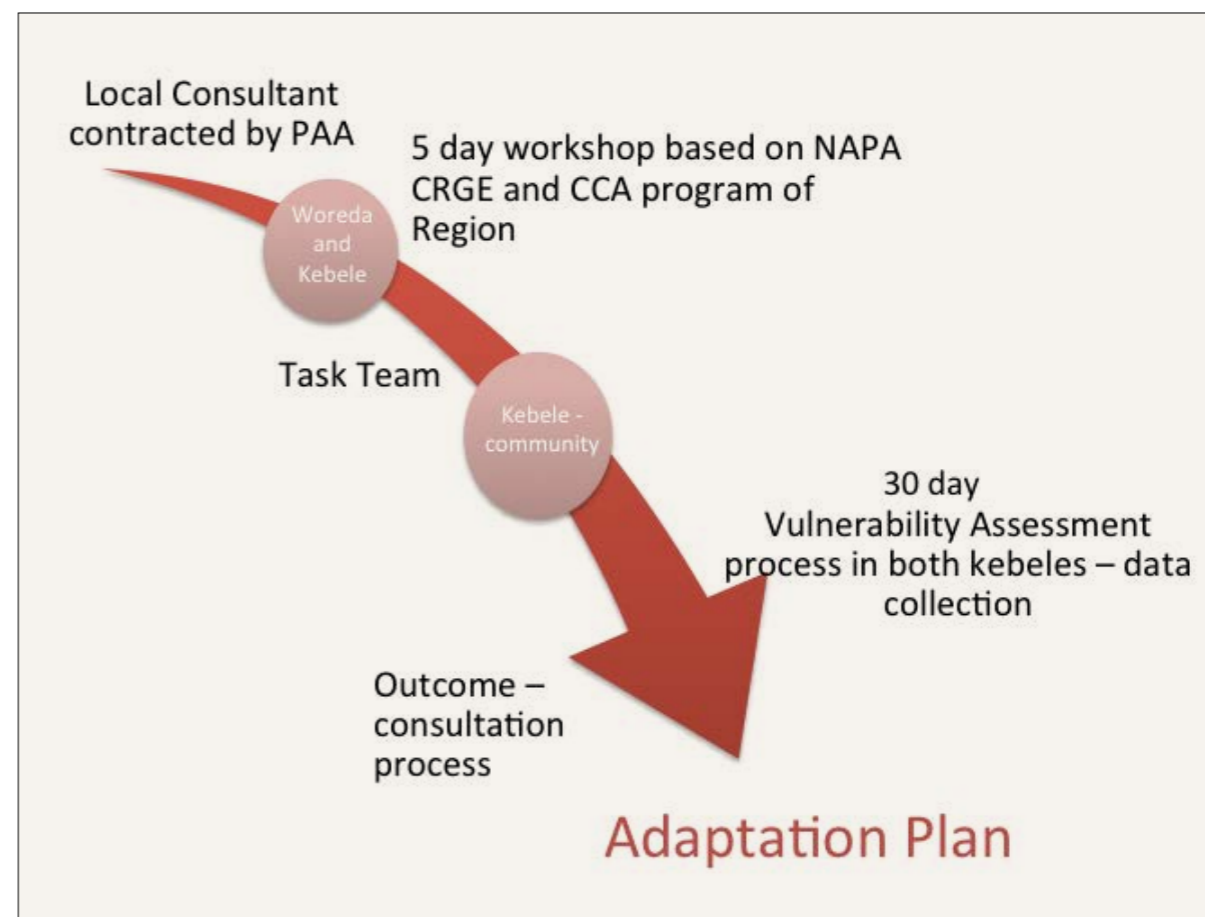
### 1. Vulnerability assessment

- a. capacity training for all stakeholders including Woreda Task force, Kebele Administration and kebele-level community groups, youth group and women’s group representatives. Training is given by the Project via a expert consultant.

- b. Adaptive add is capacity is determined through stakeholder-led workshops using NAPA, CRGE and Regional CCA (Regional Environmental Protection Agency) materials

- c. woreda Task Force assesses each Kebele during a month long assessment process mentored by the expert consultant

- i. Checklists, Questionnaires, (stock levels, yields etc),
- ii. Community focal group discussions with youth, women, landless other vulnerable groups etc,
- iii. Data collection from secondary sources, i.e. agriculture office, water dept. etc



## 2. Adaptation Plan

- a. Adaptation plans prepared based on vulnerability assessment.
- b. Activities identified based on local context and needs.
- c. Technical committee made up of woreda level line agents produce a technical plan of activities, i.e. water engineers, agronomists etc design interventions specific to kebele needs.
- d. Awareness raising conducted in kebeles.

to inform individuals and groups of opportunities arising from Project activities

- e. Community members encouraged to participate in activities
- f. Selection of community members for inclusion in activities is based on kebele-driven vulnerability criteria using poverty indicators (landless, youth, female headed households, very poor)
- g. Communities encouraged to form cooperatives

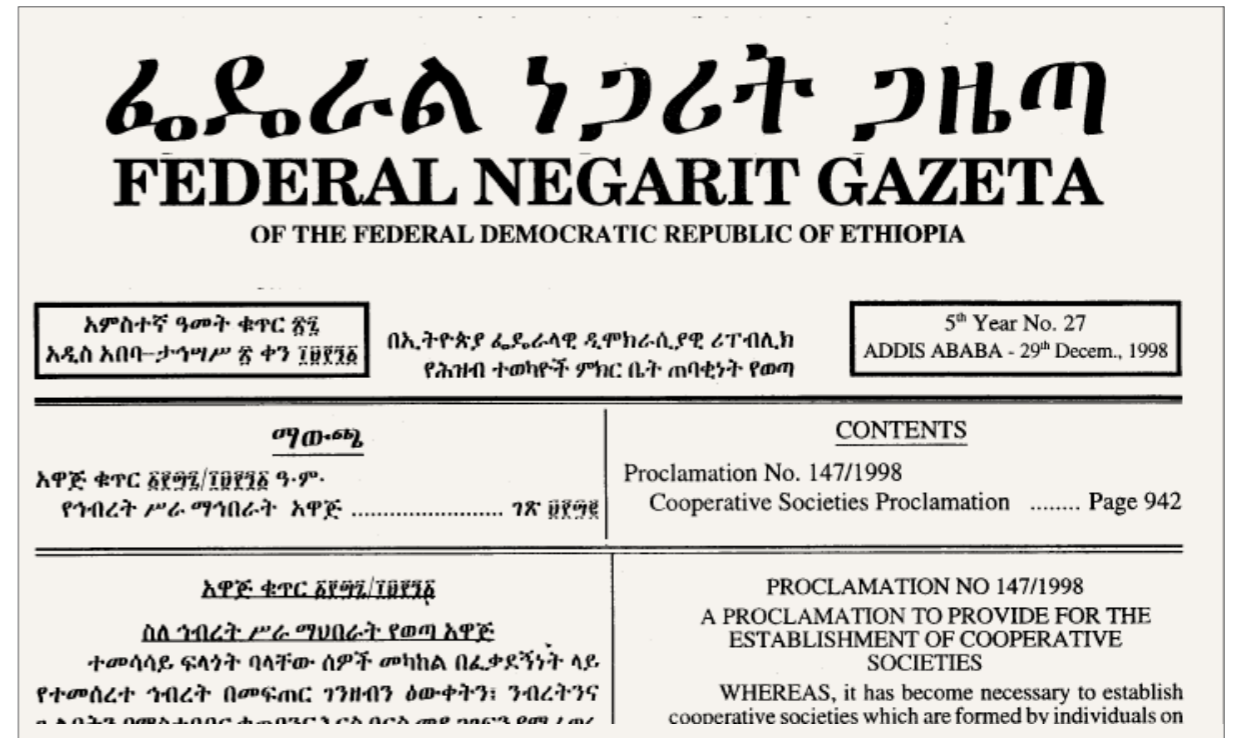
## Best Practice 6:

### Setting up cooperatives

Based upon, and immediately following on from the vulnerability assessment and adaptation plans process, the PAA project has supported kebele-based cooperative promotion and establishment activities. Cooperative promotion activities are undertaken by each woreda cooperative agency in the four woredas where the UNDP is implementing the PAA project.

following the cooperative promotion and awareness raising, specific climate resilience-building activities were designed. These were identified by the woreda administration's technical committee (government line-agents). A feasibility study is conducted to ensure proposed activities are in line with community needs and desires. primary

cooperative associations – livelihood diversification-based cooperatives including; cattle fattening, dairy farming; bee keeping; agricultural water improvement (diversion canals, treadle pumps, solar pumps); goat multiplication; and poultry production, are then established based on the Government of Ethiopia's proclamation for the establishment of cooperatives and the international cooperative alliance guidelines, cooperative advantages: economy of scale, risk sharing, ownership, focal point for trainings, responsibility sharing, enables fund raising amongst members.



While woreda administrations have been establishing cooperative outside of the PAA project for a number of years, the PAA project provides funding support for technical assistance, multi-level capacity building and provision of physical materials.

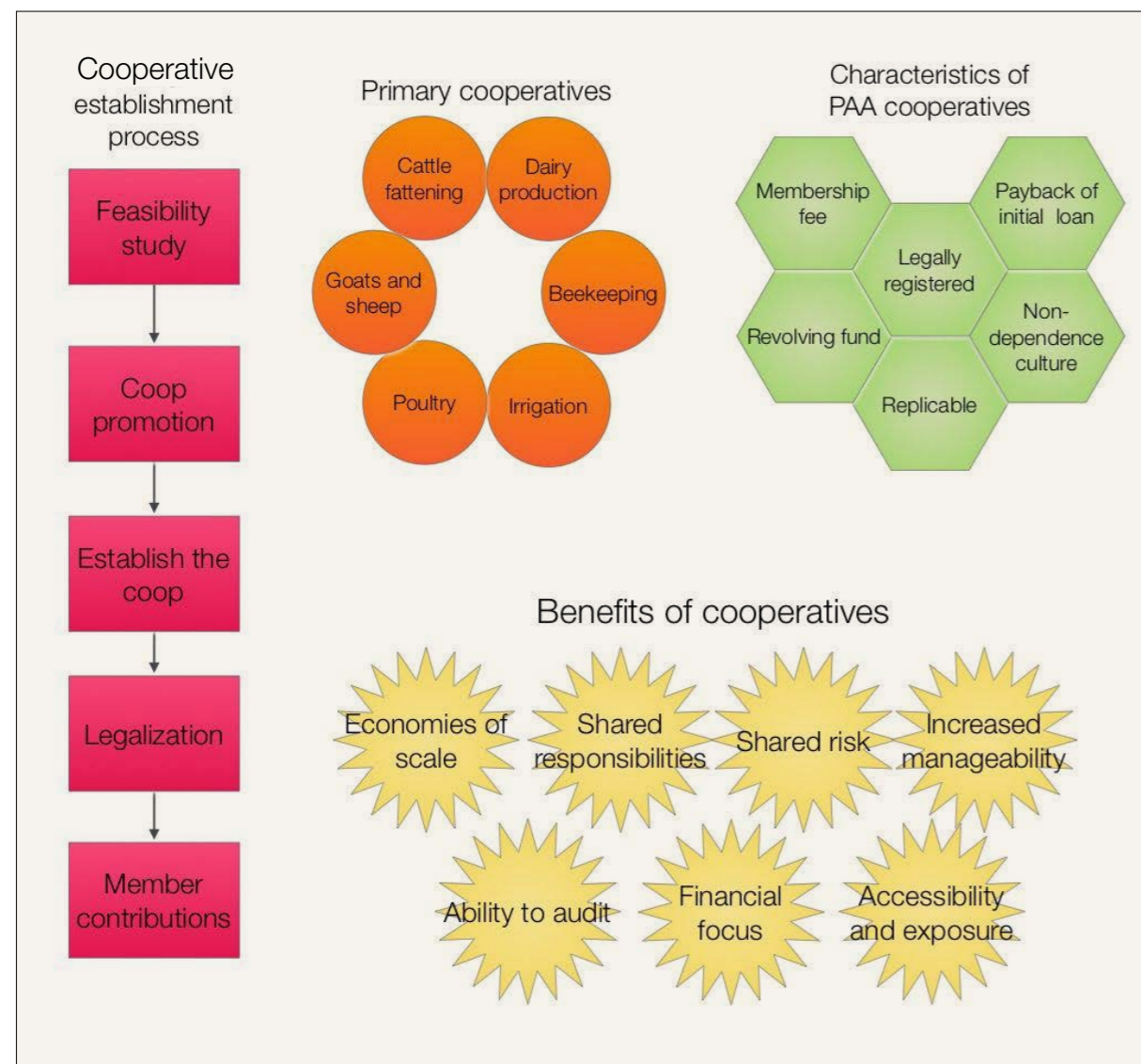
This enables more costly which enable more costly and novel climate-resilient, livelihood-based primary cooperatives to be established. The projects with focused primarily on generating sustainable benefits to marginalized poor groups such as the landless, unemployed, youth and women's groups.

### Primary cooperatives established and assisted by PAA include:

- Cattle Fattening (landless youth groups)
- Dairy Production (women-headed household groups)
- Beekeeping, (v.poor households)
- Water User Groups (irrigation)
- Poultry
- Goat and sheep multiplication

### Cooperative establishment stages:

- Feasibility study – kebele assessment (recognizing diverse needs and wants)
- Cooperative Promotion within community through raising awareness and understanding, informing potential beneficiaries of the process and advantages of co-ops including members expected contribution and benefits.
- Establishment of cooperative following International Cooperative Alliance guidelines and Government Cooperative Proclamation rules,
- Selection process – prioritization (landless, vulnerable groups etc)
- Legalization – cooperative office registration
- Member contributions – initial capital raising for savings and current account (running costs)



### Benefits of Cooperatives include:

- Attainment of economies of scale – transportation, input purchasing
- Shared responsibilities, groups delegating tasks
- Shared risks and combined funds
- Increased manageability of activities
- Improved auditing
- Improved financial focus
- Accessibility and exposure (increased visibility to potential partners and assistance government line agencies, woreda support etc)

Characteristics of PAA cooperatives include membership fees, a monetary or material (i.e. seed) contributions to a revolving fund (to facilitate inclusion of new members) and payback of a proportion of the initial investment. i.e. in dairy cattle cooperatives 50% of the cost of the original dairy cow value must be returned to the fund. Through implementing these measures, cooperatives foster a non-dependence culture where after the initial establishment has been assisted through the project, the ongoing costs and support is provided by the members, for the members. All cooperatives are also legally certified and registered by the woreda cooperative agency.



**Mr Berhanu,**

Water user cooperative association member

Before the diversion we could only produce once a year in the rainy season, we would harvest and leave the land until the rains come again next year, but now we cultivate three times each year, we sell our products in the market in Mekele.

There is a big difference for me, for everyone, I have been able to sell more and increase my income. I have bought materials for a new house and I have purchased two more oxen, before I had only one, and now I have three.

Now that we have the diversion canal, we are taking care of it, if something needs repairing we pay for it from the water user association funds... There are 53 members and each month we pay into the cooperative, the amount depends on how much land you have, if you have quarter of a hectare you pay 50birr. This means we have the capacity and resources to maintain our canal."



**Ms Askal,**

Chairwoman of women's dairy group

"We have 20 women in our cooperative, and we have been active for about seven months. The importance of the cooperative is huge, individually we would have problems accessing the market – we sell the milk in Mekele and individually this would be too expensive, but as a cooperative we share a cooperative we share the costs of transport. I produce about 12 liters of milk per day, 6 in the morning and 6 in the evening, but it varies, some people only produce 5 a day. I have 6 children, by selling the milk I earn about 120birr, which means I can feed and clothe them, enroll them in school, buy them exercise books, and everyone gets a glass of milk everyday. in addition I have saved almost 3000birr

we are now planning to set up a milk shop in the village, we are renting the building and preparing the materials."



**Mr. Berhe,**

kebele chief and chairman of bee keeping cooperative association

"we have received 60 bee hives and 30 bee colonies from the PAA project, and this year we will split the colonies and fill all of the hives. Despite a lack of rain we still managed to harvest 300kg of honey this year. We sell the honey in Mekele to buyers and traders for about 200birr/kg. We each (15 members) contribute 100birr a month to pay for the bee caretakers, this means we more than doubled our money this year, and it was a bad Next year we will have more hives... more hives and produce more honey"

**Mr. Kebeda,**

individual bee keeper, Meseret kebele, Tigray

"I have three hives, and in September I will split them, buy new hives and have six... this year each hive gave me about 35kg [180 birr/ kg, with the extra money I have earned I have built a new house and a latrine. Other bee keepers are starting small enterprises, like shops. We were chosen because we were the poorest, but now we are wealthy and the other people want to have bees too..."

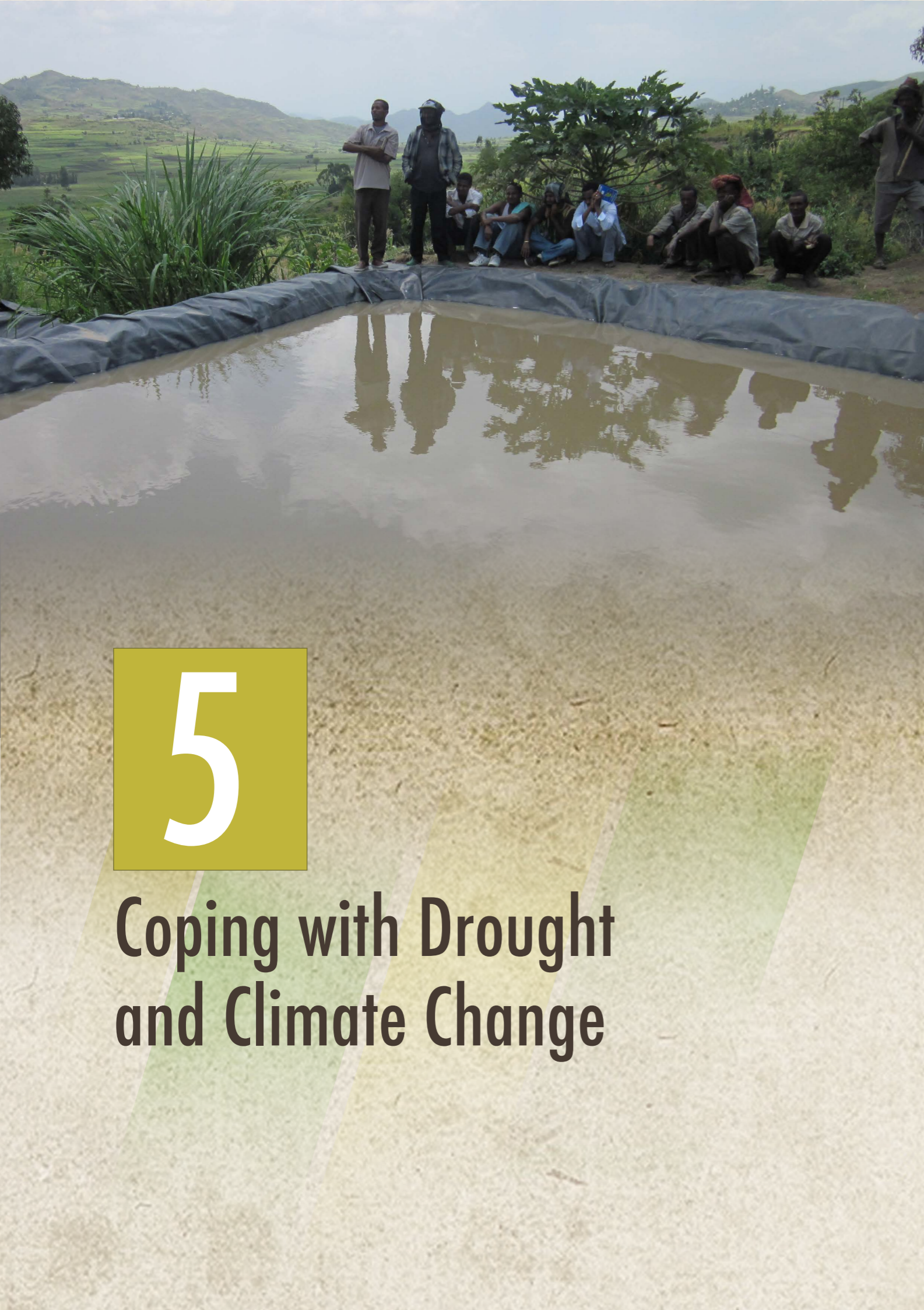


**Mr Mengistu Enderta**

Woreda cooperative chief

"The culture of the people on this area has not been strong in planning and saving, people generally do not think about investments, expenditure and incomes... in the last five years we have organized 17 savings and credit cooperatives and 17 multipurpose cooperatives, resulting in one saving and credit union and one multipurpose union. these are service-based cooperatives which provide financial opportunities to communities. the paa works within our cooperative identification and development processes, it is built in to our model, we are integrated.





# 5

## Coping with Drought and Climate Change

This chapter is based on the report “the best practices of the coping with drought and climate change project” compiled by undp and published in 2013. it is not based on the original works of the author.

The report was prepared based on information collected from various stakeholders at the federal, district and community levels. the data collection consisted of document reviews (undp country office & project office) including reports, proposals, and stakeholder accounts. semi-structured interviews were conducted with the undp country office, the district project manager and with steering committee members. while field observations were made in the areas in which the activities have been implemented.

Focusing on six kebeles (villages) in kallu district in the south wollo zone of amhara region, the project ran from 2010 to 2013. it was designed to develop and pilot a range of effective community level coping mechanisms for reducing the vulnerabilities of farming households, and particularly, women’s and children’s, to climate change. it was implemented by the Ethiopian MoA/DRMFSS, with financial support from GEF-UNDP.

Vulnerability analyses for Ethiopia suggest that environmental changes over the coming decades present a serious threat to economic and social sectors.

In order to achieve its UNDAF goals of “enhancing food security and improving the capacity of local farmers to adapt to climate change” the project provided farmers with climate variability and climate change... and climate change (drought, heat-stress, flooding) focused technologies such as those to improve water productivity, availability and water-harvesting efficiency, to address land degradation and to combat desertification were employed. Through these interventions the adaptive capacity of farming households was improved, meaning that food production systems became more resilient to drought and unpredictable and extreme weather events.

The following pages describe the best practices from the project that can be used as models for future projects through replication and/ or up-scaling.

### **Revolving fund: A system to serve more beneficiaries**

In order to ensure longevity, expansion and sustainability of asset creation support to beneficiaries, a revolving fund mechanism was designed and implemented as an integral part of the project.

### Asset creation activities included provision of:

- Sheep
- Goats
- Beehives and bee colonies
- Improved seed

### How it works

Primary beneficiaries receive assistance from the project in terms of assets such as goats or seeds. These assets have the advantage of being multipliable, and as such each recipient has the capacity to generate more assets from the initial stock and in time, pass those benefits on to secondary beneficiaries. Training is also provided on livestock, agronomic or apiculture best practices to ensure recipients are equipped with the capacity to effectively nurture their new livelihood assets. In the example of goat husbandry each primary recipient household is given five female goats in year one. By the second year it is expected that each goat will have produced at least one kid goat, all five of which will be made available for passing on to second-level beneficiaries after six months. In addition to gifting the 5 goats, the primary beneficiary is expected to pass on knowledge received during training to the next beneficiary level, and so on.

With regard to improved seed interventions “It was decided that the first level beneficiaries be provided with the [improved] seeds upon revolving fund system. The first level beneficiaries were expected to return what

they had been supported to second level beneficiaries after the first harvest, most likely after a year of support. This was supposed to help more beneficiaries and to develop farmers’ ownership of the activities, which all beneficiaries were agreed on the system.” UNDP 2013

Results from the individual activities which implemented the revolving system have been positive

### Improved Seeds

“The farmers enjoyed a productivity increase of nearly 22% for sorghum to about 100% for teff with other crops in between these figures. Almost all beneficiary farmers had got extraordinary benefits following the provision of the seeds and the technical support from the project and the district office of agriculture. In this manner farmers were able to feed their family with their own and created assets that could be used to support the food security condition.”

### Sheep and goat pass-through system

Under the project’s first level beneficiary activities farmers have been supported with sheep and goats across all sex kebeles. Below is an example of the sheep and goat benefit pass-through system in action.



**Ms. Tayitu** is first-level beneficiaries, while **Ms Yeshi** on the otherhand is in line to become a second-level beneficiary of the project/ Currently she is assisting Tayitu, from whom she will be receiving the five lambs, and learning about the husbandry of the sheep.

“I am excited with the expectations of the project, I hope to be able to get out of poverty and feed my family and myself from the support of the five sheep, in addition to the cereal production we are enjoying”.

Yeshi has also received assistance from the Project’s improved seed component and increased her household cereal yield by 10 quintals (1 tonne) this year.

As a second level beneficiary Yeshi, will be expected to pass on the first borns from her sheep to the third level beneficiary. She is also acquiring the knowledge and skills of sheep management from Tayitu which she will also use for her own benefit and pass on to the next level.

The district agriculture and cooperatives offices were responsible for the implementation of the system while receiving strong backing from the steering committee and the project management unit. The first-level beneficiaries were trained by livestock and cooperatives experts, while the second-level beneficiaries received information and experience of sheep and goat management from the preceding beneficiaries.

So far the project has supported 268 first level farmers, most of which have passed on their second generation stock to the second-level beneficiaries.

### Watershed management

A number of watershed management interventions were designed and implemented as part of the project activities across the 6 kebeles. Different types of in-situ water harvesting and soil conservation activities were introduced, including terracing, bunding and contour planting of forage, fruit tree and complimentary tree species. The watershed

management technologies were not new to the area, however the methodology in which they were introduced to the communities and the involvement of and ownership by the communities that was fostered through the project resulted in results that are both effective and sustainable

“We are here to change our lives through the conservation of the Fiyel Amba watershed. Upon construction of bio-physical conservation measures the watershed would be reclaimed and returned to productivity. Trees will be growing, grasses for animal feed, flowers for bees. We have observed that springs are recharged and are getting strong. The flooding events that have been damaging are now reduced. We have recorded [...] productivity increases because of the reduction in soil erosion, and an increase in the soil moisture of agricultural lands.’

**Ahmed Seid,** As a complementary activity, the project’s environmental management committee members are cultivating plants such as vetiver, grasses and indigenous tree species for planting on degraded lands along physical soil & water conservation structures (contour planting). Education and school involvement are other important aspects of the project, through which communities are learning that degradation of their environment contributes to their communities vulnerability to drought and climate change.

### Improved seeds provision

Crop production, a main means of income and staple food generation for communities in Kallu district has been strongly affected by recurrent drought, flooding and erratic rainfall conditions symptomatic of its harsh climate, and likely exacerbated by contemporary climate changes. As an adaptive strategy, improving crop productivity was identified as a major target in the Coping with Drought and Climate Change project.

The project has supported beneficiaries with the provision of drought resistant, high yielding and early maturing varieties of cereals and pulses. In addition to the provision of improved a beneficiary screening and selection process was undertaken (prior to distribution) to ensure that the most vulnerable and most appropriate households were targeted for inclusion. As with the goat and sheep activities, It was decided that the first-level beneficiaries would be provided with the seeds within a revolving fund system. The first-level beneficiaries were therefore expected to return an equal quantity of seed to second level beneficiaries after the first harvest, to that which they had been supported by the project. This asset repayment system was designed in order to ensure the project’s sustainability goals were met and meant that new beneficiaries could continue to be included and supported after termination of the project funding.

This approach also developed farmers’...’ ownership of the activities and foster self-reliance and community empowerment.

### Improved access to water

Kallu district is vulnerable to rainfall variability and increases in average temperatures. Irregular rainfall and a reduction in rainfall quantity results in less water in streams and rivers and longer aquifer recharge. Where overall annual rainfall does not decrease, farming communities can still be vulnerable to shorter period, more intense rainfall events and longer dry spells. In addition higher temperatures increase transpiration pressures meaning that under hot, dry conditions the amount of water plants require for growth and reproduction increases just as the amount of stored water in soils is decreasing. In addition moisture stress during critical rainfall periods (i.e.fertilization and seed-filling periods) can have even greater deleterious effects on yields at harvest time. There is a clear need for increased rainwater use efficiency through improved storage and timely distribution capacity.

The project has assisted in the provision of a number of technologies related to farmers’ improved access to irrigation water. The interventions were specifically designed to address water availability shortfalls for both rainy and dry season production of fruits, vegetables and cereal crops

Investments include the construction of seven gully crossing structures (to convey water from one area to another) water harvesting ponds and the provision of water lifting devices (wing & pedal pumps), water storage (tanks) and application materials (hoses). Improved seed (cereals and vegetables) and

fruit-tree seedlings have also been supplied by the project.

### **Hussien Muhe, 42, father of 7 Domestic and livestock water supply**

“The support from the CwDCC project includes a geo-membrane to line the two water harvesting ponds, the wing pump, a water tank and hoses. [the materials] have helped us to produce two to three times a year. Before the project the annual income of the entire family was lower than 3,000 birr, but following the project’s support, coupled with the good commitment of our family, I estimate the annual income reached more than 175,000 birr. This income has been possible from the sale of honey from the three bee hives, the sale of onion, papaya, other vegetables and fruits and from the field crops and animal products. Before the project our family was supported by food handouts for 9 months a year...now we have graduated from the food support”

Water collection for household requirement places a high workload and time burden on households in rural villages, especially those with limited resources or access to transportation (donkeys and carts). Female household members are almost always responsible for all household water needs, and women and children responsible for livestock watering requirements.

Drought conditions exacerbate water security issues, and where drought and hot spells prevail, reduce spring numbers and flow volumes places added burden on women and children to find and collect water. The CwCDD project has supported the construction/protection of six domestic and

livestock water supply springs in order to reduce these water related encumbrances and ensure a safe and readily available water supply.

Under project guidance and oversight, site selection, design and protection mechanism were undertaken directly by the community and water supply experts from the district office of Water and Energy. All the springs were designed to have five practical structures to ensure longevity and usability including a protection cap, night storage capacity, a distribution box, a cattle trough and a washbasin.

A mixed gender water management committee is responsible for the overall management of each of the schemes and the enforcement of the bylaws developed by the kebele. Water caretakers are in charge of the technical maintenance and repair of the water point.

To foster sustainability all users pay a monthly water users' fee, where the collected money is used for caretakers' payments and maintenance costs. The project provides caretakers with maintenance tools and training on the operation and maintenance of the schemes. The water management committee members have also got skills in managing similar projects.

Due to the development of the water points, anecdotal reports describe a reduction in water fetching time to a fifth of its pre-project burden across all schemes resulting in increasing women's time availability to pursue other household, business or leisure activities; household health has been improved;

students are able to attend schools owing to improvements in health and reductions in water labor demands and conflicts due to water-use have been reduced.

**Ms.Fatima Ahmed** member of the Water Management Committee. "Due to the protection and development of the spring in our village the time taken for water collecting has been reduced by two and half hours per trip - time with which we are now able to work on other activities. Misunderstandings among water users - which used to be sources of conflicts - are now totally avoided. The health of children has been dramatically improved, which helps them attend schools."

**Mr Endris** Water Management Committee member and father of 7 "The support of the project (CwDCC) in materializing the protection and development of the spring through supplying construction materials, technically managing the construction works, showing the way the community will be managing the scheme and related activities could only not be expressed in words of thanks",

### **Community level weather stations and early warning system**

The ability to plan and adapt agricultural activities with respect to inter- and intra-annual rainfall patterns, commencement of the rainy season and overall seasonal rainfall quantities are some of the most important aspects of farming communities' climate coping mechanisms.

Drought has beleaguered Kollo district communities for generations, a problem historically exacerbated by a lack of reliable and timely meteorological information analysis and dissemination mechanisms, and contemporarily by the additional threat of climate change. While there have been attempts to address this problem through the establishment of an early warning system, the mechanical analysis of meteorological and agronomic data and its communication were slow & unreliable - based on only qualitative local data and poorly analyzed non-predictive meteorological data.

For decades, if not centuries, these losses in potentially saved or improved harvests -and the resulting losses of lives and livelihood - have been detrimental to the people of Kollo's ability to lift themselves out of poverty and achieve a status of autonomous food security.

In order to implement the activities, the project supported the training of both the Wordea Agriculture Office and the Kombolcha Meteorology Directorate in data collection, data analysis and forecasting. In addition to forecast generation, forecast dissemination was supported through the establishment of a district-level early warning system that focused on fostering better organization and well defined, clear responsibilities for all actors with the relevant regional, district and village level administrations and technical authorities.

**Mr.Rahmet**, woreda agriculture office

"This is a dramatic shift of technology for the farmers, the early warning team of Kalu woreda agriculture office, and Kombolcha meteorology branch office. The data collection mechanisms are so simple, the analysis mechanism is well organized, and the use of the analysis results by farmers is as simple as any agricultural activity. Therefore, there will be no gap in information communication and there will also be no information distortion. This, hopefully, will help the farmers to act successfully to get themselves ready for all conditions. The low cost and simplified early warning technologies shall in any circumstance be replicated to other areas and do get multiplication"



