Sustainable Water Fund (FDW) subsidy FDW17072C Project Proposal

Annex 1 to the application

IMPROVED WATER ALLOCATION AND IRRIGATION EFFICIENCY IN THE ZIWAY-SHALLA BASIN

Wetlands International Foundation

In cooperation with

Rift Valley Lake Basin Authority

World Waternet Foundation

Acacia Water BV

Meki Batu Cooperatives Union

Joytech Plc.

Contents

1. General project information

Project title:	Improved water allocation and irrigation efficiency in the Ziway-Shalla basin		
Partnership	**Organisation name**	**Type**	**Legally based in**
Lead partner	Stichting Wetlands International	NGO	The Netherlands
Partner	Rift Valley Lakes Basin Authority (RVLBA)	Public	Ethiopia
Partner	World Waternet	Public	The Netherlands
Partner	Acacia Water B.V.	Company	The Netherlands
Partner	Meki Batu Fruit and Vegetable Growers' Cooperatives Union	Company	Ethiopia
Partner	Joytech Plc.	Company	Ethiopia
Project location(s)	Ethiopia		
FDW theme	☐ Sustainable access to clean drinking water and sanitation (including waste) ☐ Efficient water use, mainly in agriculture ☒ Improved river basin management and safe deltas		
Secondary FDW theme(s)	☐ Sustainable access to clean drinking water and sanitation (including waste) ☒ Efficient water use, mainly in agriculture ☐ Improved river basin management and safe deltas		
Project purpose	• To ensure a balanced Ziway-Shalla Basin ecosystem with a sustainable and transparent water usage and distribution system. • To improve water security and income of agricultural producers, particularly small farmers and women, in the lake Ziway catchment area.		
Project key outcomes and outputs	Key outcomes: • 800 smallholder farmers, of which at least 20% women, on at least 200 ha, have transferred to improved agricultural practices, decreased water use and increased yield and income; in case a man is the land owner, cooperation contracts are signed by both spouses. • At least 1,000 additional farmers have expressed interest for improved horticultural farming with efficient water use. • Water balance in the basin improved with water abstraction by the agricultural sector decreased with at least 2 mln m3; inflow into Bulbula river increased with at least 10% and into lake Abijatta with at least 5%. • Conditions created to reserve a part of the collected water revenue for interventions that support wetlands, reduce land degradation and water use. • Key stakeholders understand and support water-revenue based basin management model. • RVLBA has the required capacities and resources for sustainable water basin management including rollout of WAP, data monitoring and stakeholder management. • Erosion in the catchment of the Lake Ziway reduced on 500 ha; sediment in targeted tributaries to Ziway and Abijatta reduced with at least 10%. • Increased number of watershed interventions undertaken by at least 20 communities. Key outputs: • Business case for improved irrigated farming at smallholder level developed and piloted with 800 farmers, of whom at least 20% women, including introduction of water meters. • Improved cultivation practices with efficient irrigation demonstrated to 4,000 farmers. • Support services for farmer transition to improved farming practices with efficient irrigation established and operational. • Water Allocation Plan (WAP) for the Ziway-Shalla basin completed, based on water balance as basic principle; WAP includes maximized water usage volumes		

	per area/type of users, water permits, tariffs, payment modalities and provisions for water security investments. • WAP pilot-tested with the largest water users (at least 800 horticultural farmers) including the introduction of water meters. • Stakeholder engagement process completed, WAP endorsed by key stakeholders and approved by authorities. • Stakeholders are trained on environmental protection and responsible water usage. • Organisation, procedures and capacity of RVLBA for WAP implementation and management developed, including integral basin management, revenue collection, financial planning and management. • Internal and external stakeholder convening structures in place, including sufficient representation of women and capacity of RVLBA for stakeholder management developed. • WAP data centre established and capacity of RVLBA for data monitoring, reporting and management developed. • Upland agricultural systems reviewed; the most effective anti-erosion interventions and target areas identified. • Interventions in anti-erosion activities for upland farmers and farming communities implemented in collaboration with the communities, involving at least 600 farmers, of which at least 20% women. • Upland farming communities (incl. woreda extension services) with at least 600 farmers, of which at least 20% women, trained on sustainable agricultural practices including erosion mitigation. • At least 2,000 additional farmers attended awareness workshops in upland communities regarding the consequences of unsustainable practices for the water basin.
Project summary	Based on a systematic approach, the project aims to address the key problems causing the decline in water quantity and quality in the Ziway-Shalla basin, namely: • Unchecked and inefficient use of irrigation water by smallholder horticultural farmers; • Lack of transparent and fair water allocation and sharing model; • Limited institutional framework and capacity for basin management; • Poor watershed management causing erosion and sedimentation. Upon completion of the inception phase, the partners will simultaneously engage in four groups of activities. Work Package 2 focuses on supporting smallholder farmers to improve their productivity and water use efficiency. Demonstration fields will be established at 150 lead farmers at multiple locations; another 650 farmers will participate in the pilot. Through training and field days, partners aim to broadly demonstrate a business case for improved farming practices with efficient irrigation, reaching the majority of irrigation farmers in the area. The local public authority responsible for the basin management – RVLBA – will be supported to develop, in a participatory way, a Water Allocation Plan (WAP) based on water permits and tariffs, and ensure that this plan is endorsed by stakeholders. Water meters will be introduced at the pilot group by the end of the project (Work Package 3). Furthermore, Dutch expert partners will engage in institutional strengthening of RVLBA, aiming to enhance the organisation with the right infrastructure and capacities to manage the basin resources responsibly, based on real-time data and clear internal procedures, while covering its operational costs from water revenues (Work package 4). Finally, in Work package 5, the project will undertake a range of watershed interventions at the most critical sites, generating on-farm benefits for upland

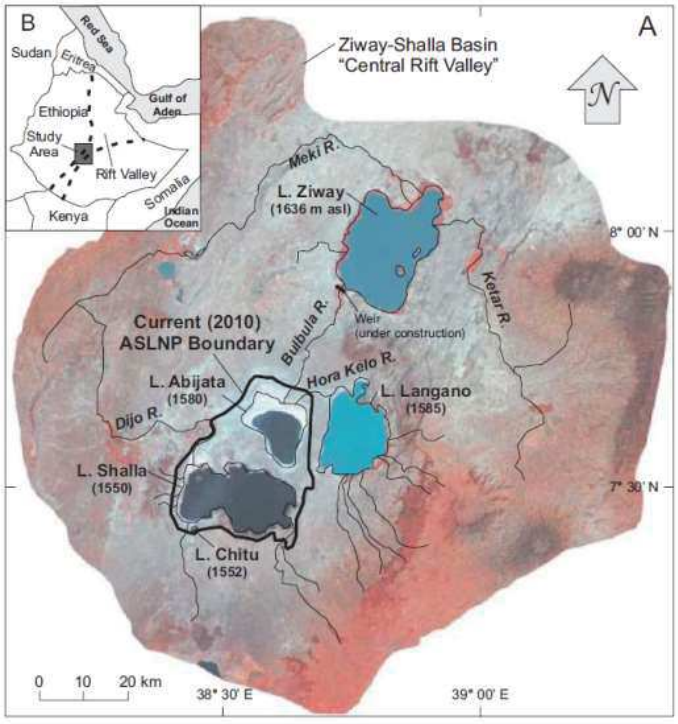
	farmers while increasing their awareness with regard to unsustainable land management, subsequent erosion and long-term consequences of such practices. By the end of the project, results will be achieved in terms of decreased water abstraction and sedimentation, with improved income for smallholder farmers. Conditions will be in place for broad rollout of the Water Allocation Plan, including the introduction of water meters at irrigated farms, which is the precondition for sustainable management of the water resources in the area.		
Project duration	**Start date:** 1-9-2018		**Final date:** 31-8-2022
Project budget	€ 4,286,575	**Requested subsidy**	€ 2,976,575

2. Introduction

2.1. Context analysis

PROJECT LOCATION – MAIN CHARACTERISTICS

Ziway-Shalla sub-basin ('Ziway basin') is one of the four lake sub-basins in the Ethiopian Rift Valley. It is located about 150 kilometres south of Addis Ababa and covers 15,000 km2, divided between Oromia and SNNPRS (Southern Nations) states. It is a closed water basin, comprising the catchments of Ziway, Langano, Abijatta and Shalla lakes. Lake Ziway is the only fresh water lake in the Rift Valley. Lake Abijatta, which feeds from Lake Ziway, is part of the Abijatta-Shalla national park and the most important wetland area in Ethiopia for migratory waterbirds such as flamingo's. Due to its closed system status, Ziway basin is very vulnerable to ecosystem changes.



Lake Ziway is a relatively shallow lake (between 2.5 and 9 m depth) that contains an estimated 1.1 Mm3 (billion m3) of fresh water. It is fed by the Meki river (discharging the runoff from the plateau west of lake) and the Ketar river (water from the eastern and south-eastern plateaus). The catchments of these two rivers cover 5610 km2. The average annual lake inflow of the lake Ziway is 755 Mm3 per year. A major part of the water inflow of Lake Abijatta originates from Lake Ziway through the Bulbula River, creating a hydrological connection. It is estimated that groundwater contributes approximately 20% of the total inflow into Lake Abijatta.

The climate in the Ziway basin is humid (in the highlands) to semi-arid (in the valley). Highlands have lower annual average temperatures (°C15) and higher rainfall (1150 mm) than the lower lands (°C20 and 650 mm). The main rainy season is between June and September and the dry season is between October and May (short rainy period in March). Typical vegetation in the area is acacia woodland but due to high population pressure and related livestock rearing, woodland is frequently overgrazed.

Ziway basin has several important functions:

- Socio-economic: it provides livelihoods to the population involved in irrigated and rainfed agriculture, livestock rearing, floriculture, fisheries and tourism sectors; it is considered one of the investment hubs in the country;

- Water security: it provides drinking water supply to urban and rural communities;
- Environmental: its rich biodiversity supports a large number of aquatic birds, fish and ruminants; extensive wetlands and marshes enable filtering of pollutants and sediments.

Water imbalance is currently posing a threat to all three functions of the basin. The volume of water drawn from the Lake Ziway for irrigation purposes has been increasing in the last two decades, with declining water quantity and deteriorating water quality as a result. Furthermore, erosion caused by unsustainable land use, deforestation and overgrazing in the watershed have aggravated the problems as sediment is now filling up the shallow lake. If business as usual continues, Lake Abijatta, which has already lost 35% of its surface area since the year 2000, may well disappear within the coming two decades causing a collapse of the bird populations and water related economic activities in the area. Households, farmers, fishermen and other water users in and around Lake Ziway will face water shortages due to declining water levels and sedimentation while the increased use of agro-chemicals and water discharge by the industry will contribute to increasing water pollution levels.

SOCIO-ECONOMIC STATUS

Ziway basin is home to 2 million people[1], of whom the majority is rural. Rift Valley Lakes Basin Authority (RVLBA) has assessed the water resources in the Rift Valley in 2009[2], qualifying the region as water-scarce. This contributes to the fact that about one-third of the population are chronically poor and food insecure. This is particularly the case in the areas that are sensitive to droughts and erratic precipitation due to climate change, such as rural areas in the hills and in the valley to the south of the lake Ziway. Low productivity and small land holdings contribute to the perpetuation of the problem. On the other hand, due to favourable climate and the vicinity of fresh water, farmers around lake Ziway have got increasingly involved in irrigated horticulture, responding to the growing demand for fruit and vegetables from urban centres.

Overall, agriculture is the key means of income earning in the Ziway lake area. 36% of households earn their income from (rainfed) crop production and 35% from livestock rearing[3], with smallholder farms being the key source of income generation. On average, rainfed farms earn considerably less than the horticultural farmers with access to irrigation, whose average household income was about Euro 2,200 in 2015.[4] There is a gradual shift, however, to employment in the services and manufacturing, supported by the policy of the Ethiopian government that aims to decrease dependence of income earning from direct utilisation of natural resources. Large floriculture estates in the vicinity of Ziway have provided employment to thousands of people, mainly women. In the rule, however, women have less employment opportunities than men and they are also burdened with higher workloads (domestic, on-farm), while having limited access to resources.

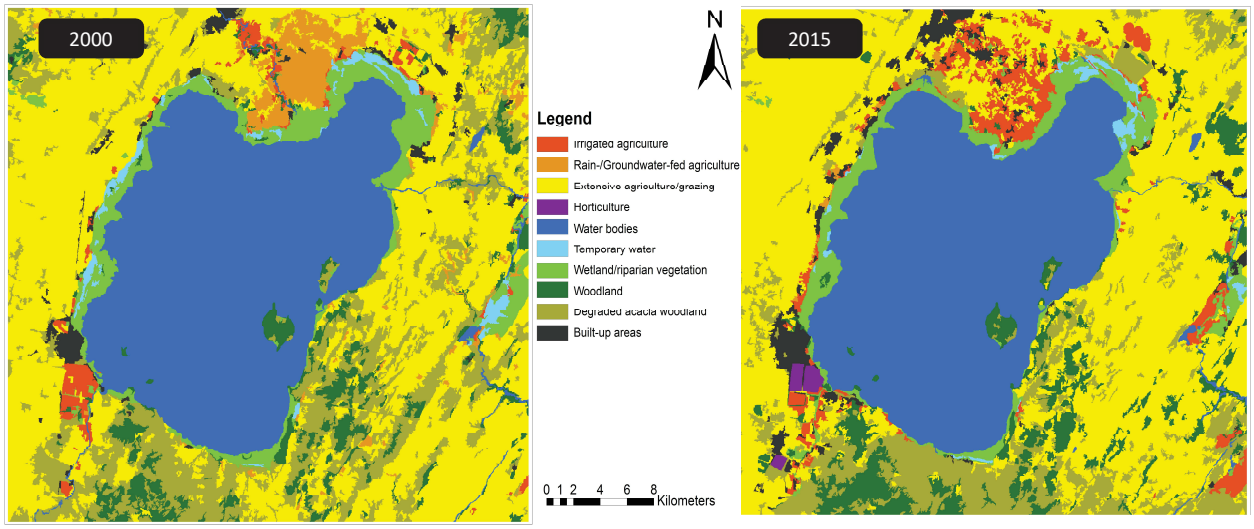
Ethiopia has a high population growth rate of 2.5%, with average family size of 5.1. Median age is 18.8 years. In the Ziway lake region, the population density is relatively high, and larger villages and urban centres (Meki, Ziway, Awassa) have been growing in the past decade. Ethiopia has been making good progress in general education, with over 80% enrolment of both for boys and girls into primary education, which is the precondition for creating an educated workforce that will drive the development of non-agricultural sectors. Rift Valley is an ethnically diverse area, with the majority of population belonging to Oromo ethnic group.

SMALLHOLDER AGRICULTURAL PRACTICES

In the Ziway basin, over 80% of the population is to some extent engaged in agricultural activities. For 36%, crop farming is the main source of income. As the average farm size in the Ziway basin is 1.7 ha, often divided between several plots, it is evident that smallholder agriculture is still the predominant farming modality. There are substantial differences, however, between production systems in the region, depending on the position, climate, altitude (high-low land) and access to water resources (irrigation). These are:

[1] CSA, Statistical Abstract 2013. Ethiopian Central Statistical Authority, Addis Ababa, Ethiopia
[2] RVLBA Master plan, 2005: The total annual inflow in the Rift Valley Lakes Basin amounts to 5,300 Mm3, giving per capita water availability of 597 m3 per annum, which is lower than the IWMI threshold of 1,000 m3.
[3] RVLBA Master plan, 2009
[4] Willingness to Pay (WTP) for Ecosystem Goods and Services of Wetland (In case of Lake Ziway) International Journal of Scientific Research in Agricultural Sciences, 2(8), pp. 175-184, 2015

- Irrigated horticulture, mainly practiced on the northwest side of the lake, along the Meki river and all the way down to the lake. (As illustrated by the maps below, in the past 10-15 years, irrigated smallholder horticulture in the area around Lake Ziway has grown considerably.) Typical yields are 2.35 ton/ha for cereals and 15 ton/ha for vegetables.[5] Most farmers engaged in this farming system are members of cooperatives and joined in the Meki Batu Union.
- Rainfed or groundwater-fed agriculture (maize, sorghum farming), usually in combination with livestock rearing, practiced all around the lake and upland, varying in scale and intensity. Typical yields are 1.7 ton/ha for cereals and 8 ton/ha for vegetables.
- Upland irrigated farms farther from the lake (not shown on the picture); mostly larger scale banana and coffee agroforestry farms.
- Intensive horticulture / floriculture under protected conditions (mostly southwest of the lake, around the town of Ziway). The largest companies involved are Sher and Castel Wineries.



In horticulture, small farmers rely on local OP (open pollinated) seed varieties, but hybrid seeds have also started appearing on the market in the past years. Although the investment is higher, farmers who have transferred to improved hybrid seeds fetch much higher yields and income than traditional farmers. As reported by the LIVES project[6], in Bora and Dugda districts (part of the Ziway basin), farmers have realised up to 7 times higher yields of tomato, earning over 20 times more from the same plot of land. Improving seed material, however, needs to go in pair with improved farming practices. Currently, farmers apply fertiliser and agro-chemicals without consideration for the micro-conditions of their land, which results in soil depletion, water pollution and sub optimal farming results.

A study into smallholder horticultural farming in the Lake Ziway area, executed by Wageningen University in 2012[7] with the support of the Dutch Embassy in Ethiopia, already showed that small scale irrigated farming practices were unsustainable. A set of interlinked interventions was proposed to improve the sustainability and income earning potential of smallholder horticultural farmers, including:

- Introduction of improved planting material and improved nurseries and seed beds;
- More efficient application of fertilisers and pesticides; application of better quality pesticides;
- Diversification of cropping;
- More efficient use of water. Customary practices (using flood irrigation) result in overuse of water on vegetable farms, with nutrients being washed away, pests and diseases occurring more frequently and production costs raising (due to higher fuel consumption).

GENDER

In the Global Gender Gap report 2016, Ethiopia showed some of lowest scores on the gender equality performance indicators in sub-Saharan Africa, ranking the 109th out of 144 countries in terms of the

[5] RVLBA Master plan, 2009
[6] https://lives-ethiopia.org/2014/10/01/hybrid-tomato-seedling/
[7] Scoping study of horticulture smallholder production in the Central Rift Valley of Ethiopia, Plant Research International (part of WUR) with Ethiopian Horticultural Producers and Exporters Association (EHPEA), 2012

magnitude and scope of gender disparities. Ethiopian girls and women are strongly disadvantaged compared to Ethiopian boys and men. They are less educated, have a lower level of literacy and are less likely than men to be engaged in professional, technical, or managerial fields. They suffer from low status in their society and have less exposure to mass media than men. Also, their health has been adversely affected by poor nutrition, poverty and restricted access to health care services.

The greatest progress has been made in access to primary education in urban areas, but the gender gaps are still larger in rural areas. On higher level of education, the gender disparity increases, with lower participation of adolescent girls than of boys.

Looking at women's participation in economic life, women are hindered by their limited skills and greater burden of household responsibilities (Labour Force Survey 2005 reported a clear division of domestic work across genders, with women's workload being higher, independent of the time that a woman spends on paid employment). Overall, women are less employed in formal jobs and disproportionately concentrated in unpaid, informal or flexible jobs that offer lower earnings and less security. Women's ability to move to better jobs is limited. The 2005 National Labour Force Survey showed that women represent 47% of Ethiopia's labour force, however 68.5% of employed women were unpaid family workers and 24.8% were self-employed in informal jobs.

Although Ethiopian laws give equal property rights to women, women's low social and economic status combined with tradition limits their ownership of assets. Men are more likely to be the sole owners of land and houses and women's access to resources is usually mediated through men (fathers or husbands). Women have little access to credit facilities, due to illiteracy and/or inability to meet the required initial payment. Both factors also limit women's access to complementary inputs such as improved planting material and farm technology (e.g. irrigation systems). If women own land, their farms tend to be smaller and more dispersed (average land holding size of women 0.68 ha against 1.11 ha for men) and they have less access to extension services.

The Government of Ethiopia is explicitly committed to the achievement of gender equality. The Constitution guarantees equal rights to women and the Women's Policy of Ethiopia reiterates the Government's commitment to gender equality and for mainstreaming gender in Ethiopian policies. Equality between men and women, and boys and girls, is also one of the central pillars of the Growth and Transformation Plan and a national gender mainstreaming guideline has been developed to be adopted and implemented in laws and regulations. Unequal distribution of power and decision making at all levels of government is, however, another challenge in stride for gender equality.

RVLBA also acknowledges the gender perspective in integrated water resources management (IWRM), and has outlined its key principles for gender mainstreaming as follows:

- Concern for effectiveness and efficiency in water sector programmes and projects. A project is more likely to achieve what planners hope it will achieve if women and men (both rich and poor) are active participants and decision makers.
- Concern for environmental sustainability. Due to their distinctive engagements with the natural environment, women's experience and knowledge are critical for environmental management.
- Need for an accurate analysis of water resources use. With a gender analysis, planners gain a more accurate picture of communities, natural resource uses, households and water users.
- Concern for gender equality, equity and empowerment. Without specific attention to gender issues and initiatives, projects can reinforce inequalities between women and men and even increase gender disparities.
- Realization of international commitments by governments and partners who have made commitments to support equality between women and men.

Gender differences are very clear regarding the use of water in Ethiopia. Women are generally the primary users and managers of water used for cooking, cleaning, subsistence agriculture, health and

sanitation and responsible for collecting and storing the water for drinking/household needs. Women spend many hours per day fetching water for their families from distant sources. If water resources decline, women have to walk even further and spend more time collecting water. For girls in particular, the task of carrying water often stands in the way of their education.

Men primarily use water resources for income-generating activities such as large-scale farming and agriculture or livestock and are responsible for irrigation. Due to low participation of women in water related decision making and planning, men's interests are generally better secured in such processes.

The lead applicant for this project has gender policy in place, aiming to mainstream gender in all the projects implemented by the organisations. Wetlands International has, for example:

- In West Africa, organised courses specifically for women, in response to a gender imbalance in the participation at wetland management training courses.
- Worked through local women associations in many community-based projects.
- In the Inner Niger Delta project in Mali, provide funding to local women associations for investing in alternative livelihood activities, which has proven very successful (measured by profits and continued investment capacity).
- In Senegal, supported projects of local women's groups to restore several coastal wetlands as part of local/village based development strategies.

All project partners underwrite the necessity to deploy activities that are gender-transformative and have built up experience with the implementation of different interventions. Acacia Water, Wetlands International and Waternet adjust their team composition depending on the activities to be performed to ensure that the voice and input of women is considered during implementation of projects. At Joytech, 70% of the workforce are women while Meki Batu has 1,500 female members and another 30,000 women are household members of the 6,800 male members of the union. Meki Batu aims to enhance the position of women as horticultural growers and takes gender issue into account when implementing projects. One of the projects was "Gender and Youth Empowerment in Horticulture Markets", which targeted 20,000 beneficiaries with an emphasis on women vegetable producers.

SUSTAINABILITY

Due to the upsurge of irrigated horticulture in the Ziway region, the level and quality of water in the lakes have been deteriorating. Furthermore, erosion caused by unsustainable upland land use, deforestation and overgrazing have aggravated the problems. So, the impact of human activity on the limited natural resources in the area has become a threat for the livelihoods and the environment of the Ziway basin. Various limitations in terms of capacity and resources have prevented the stakeholders to turn the trend around. Smallholder horticultural farmers lack technical and financial capacity to improve their production practices and are poorly aware of the consequences of flood irrigation for the lakes basin. On the south side of the Lake Ziway, however, smallholder farmers are experiencing water shortages already and have seen their income shrink due to their inability to produce any crops during the dry season. Upland farmers also lack resources to engage in more sustainable practices as their priority lays in income generation for the short term. Consequences of overgrazing and poor land management, however, are far-reaching, both for their own future farming and for the basin as a whole. In summary, Ziway basin is an example of competing claims between economy (livelihoods, investments) and environment, creating a complex situation that requires change of attitude, commitment from different stakeholders, support to more vulnerable groups and considerable technical and financial resources to be solved in a sustainable way.

Public authorities, on their side, also have limited capacities and resources to develop and implement a sustainable lake basin management system. Without water revenues, they are fully dependent on federal government allocations and donor-funded projects, which is not beneficial for the long-term policies and their implementation. Realising the earnestness of the situation, Ethiopian government has started working on a knowledge base for well-informed decision making in basin management over ten years ago[8]. The first Master plan for the Rift Valley integrated water management was presented by the Ministry of Water Resources in 2009. Thereupon, the Ministry has established three water basin authorities, aiming to develop structures that will manage the water resources independently and

[8] Ecosystems for water, food and economic development in the Ethiopian Central Rift Valley, WUR, Hengsdijk and Jansen, 2006

sustainably, based on own income from water revenues. Abbay and Awash basin authorities are already operational and the Rift Valley Lakes Basin Authority (RVLBA) was the last to commence operations in 2014. All basin authorities operate under the Basin High Council, whose secretariat is at the Ministry of Water Resources. RVLBA is currently assigned the task of developing and implementing a Water Allocation Plan (WAP) that will have to ensure sustainable and equitable management of water resources in the Ziway-Shalla sub-basin.

Although water is considered a common good, at present large and small farmers, and other users, have come to understand the importance of the lake and the necessity to manage the water resources sustainably. A recent study[9] indicates that nearly three quarters of the farmers in the lake area are willing to cooperate with any future management plans aimed at protecting Lake Ziway and its watershed, provided that they are implemented jointly by government bodies, local communities, farmer cooperatives and NGOs.

So, to turn around the declining water resources trend, a coordinated and broadly accepted action is required. RVLBA has commenced the work on the restoration of the Ziway basin already. A workplan for the development of a WAP was completed in 2017, involving public and private stakeholders, local population, knowledge partners and other local and international supporting partners, among which several Dutch organisations. As a recently established organisation, RVLBA however still lacks experience, networks and resources for the full implementation of the WAP. Due to the urgency of the Ziway basin problem, RVLBA is keen to take further steps, strengthen its own organisation and solve the most critical issues to stop the drying up of the lake, starting with a viable water allocation strategy and targeting the irrigated agriculture in the first place.

THE DUTCH POLICY AND ACTIVITIES IN ETHIOPIA

The Dutch Embassy supports water related activities in Ethiopia, mainly through:

- Promoting efficient and sustainable use of water, particularly in agriculture;
- Supporting water governance and basin management programmes;
- Providing a platform for the Dutch water sector and enhancing private sector engagement in the Ethiopian water sector.

Although water is not among the three development cooperation spearheads selected by the Dutch Embassy, the presence of various Dutch water-related organisations in Ethiopia, the linkages between water, health, food security and private sector development, and the strategic 'water'-role of Ethiopia in the Horn of Africa region, has led the Embassy to recognise the need for a solid water portfolio as a part of its development cooperation strategy. In the agricultural sector, the Dutch Embassy has supported a range of food security projects and programmes in the past years, including in the horticultural sector (vegetables, flowers). The focus of these initiatives has been on private sector driven and inclusive agriculture, which resonates well with the activities proposed in this project. In the Ziway basin area, several Dutch organisations have been active, such as Wetlands International (the applicant for this project), World Waternet, Acacia Water, IDH, Sher and others. The project will aim to build connections between different initiatives – including the ongoing food security project in the smallholder horticulture sector implemented by SNV – so that the (shared) objectives are attained efficiently effectively.

OTHER INITIATIVES IN THE ZIWAY AREA

Other initiatives that are currently on-going in the Ziway basin:

- A Climate Resilient Site Network in the African Eurasian Flyway (funded by the International Climate Initiative of the German Government); a comprehensive wildlife conservation programme aiming to maintain and / or restore internationally important wetland areas for migratory birds (of which lake Abijatta is one) on a landscape scale. The project was the start of Wetland International's involvement in the basin and has laid the foundation for the current initiative through: connecting stakeholders across the basin, facilitating management planning in Abijatta-Shalla National Park and in 2018/2019 it will engage in community based activities

[9] Farmers' awareness and perception of Lake Ziway (Ethiopia) and its watershed management, Chair of Ecosystem Planning and Management, EiABC, Addis Ababa University and a group of Ethipian and German scientists, Limnologica, July 2017

to reduce erosion in the National Park (with the Ethiopian Wildlife and Conservation Authority) and eroding hills south of Lake Ziway (with partner HOAREC).

- Partners for Resilience programme (a collaboration between Red Cross, CARE NL, Cordaid, Red Cross Climate Centre and Wetlands International, funded by the Dutch Ministry of Foreign Affairs) aims to increase the disaster resilience of vulnerable communities. In the Ziway Basin, the initiative supports community assessments and action planning in the National Park. It also finances a Water Potential and Demand study (to be completed by the end 2018) together with IDH and RVLBA, which will serve as the knowledge base for this project to build upon.
- ISLA project, managed by IDH, fostering sustainable land and water management in the landscape around lake Ziway, has brought together public and private partners such as RVLBA, key private sector actors (Sher Ethiopia Plc, Castel Winery Plc, Verde Beef, Al Foz plc), consultancy agencies (HoAREC, Meta Meta and Acacia Water) and the Meki Batu farmers union. This existing coalition and its Stakeholder Committee organising mainly the larger private sector parties in the region) will provide a strong foundation for the water allocation activities to build upon: 1. RVLBA, IDH and Wetlands International are members of the WAP steering committee. 2. Through their stakeholder committee, IDH will ensure the engagement of the larger private sector in the WAP process. 3. The restoration activities that IDH and private sector jointly finance, will geographically be complimentary 4. IDH is working with Meki Batu to have ca. 170 farmers Global Gap Certified. This scheme mainly focusses on reduced pesticides use and increased market access. The project will build upon this initiative to supporting farmers also in reducing water use and increase their productivity.
- World Waternet and Waterschap Zuiderzeeland are engaged in capacity building of Ethiopian basin authorities. In its 2016-2018 programme, World Waternet has supported RVLBA with a SWAT analysis, trainings related to basin management & GIS and they have advised on the WAP roadmap. The proposed project will build upon the foundation laid in this project.
- Watershed Rehabilitation Programme implemented by the Ministry of Agriculture and Natural Resources; this initiative will be supported by providing necessary capacity building of communities and woreda/kebele extension officers through training and demonstration units. The funding available through this programme will facilitate sustainability and further take up/scale up beyond the duration of the proposed project.
- Watershed Management programme implemented by RVLBA aimed at treating big gullies from which sediments transported to rivers and lakes. Initiatives are geographically complementary.
- African Development Bank is planning to support water management in the region, through support services and hardware (HoAREC consultant to be based in the RVLBA office). Although the details are yet unclear, the consortium will be ideally placed to influence and align with ADB. Discussions are currently ongoing on how to best align our activities.
- SNV is working on marketing aspects with Meki Batu union and this project will collaborate with the SNV initiative to secure market access for farmers participating in the SWF project.

LAWS, POLICIES, REGULATIONS

Ministry of Water, Irrigation and Electricity is the highest authority responsible for water resources in Ethiopia. It accommodates the secretariat of the Basin High Council, which is the overarching decision-making body for the three currently operating basin authorities (Abbay, Awash and Rift Valley Lakes). Rift Valley Lakes Basin Authority, established in 2011 and in operation since 2014, is in charge of the Ziway-Shalla sub-basin. Its head office is in Awassa. It has the mandate to develop and implement revenue-based water allocation in the basin and ensure sustainable management of the water resources through consultation and acceptance of stakeholders.

The Master plan of 2009 for the Rift Valley – currently under review - is the underlying document for the development of policies and activities in the Ziway sub-basin. It states, among others, that:

- "Agriculture continues to play a central role in the growth of the economy over the Master Plan period. There is good scope for increasing agricultural production but there are limits to the rate of growth and the maximum level of productivity."
- "The extremely low agricultural productivity and the constraints to increasing it are also key issues. Linked with increasing agricultural productivity is the need to develop markets for agricultural products and to educate farmers in improved agronomy and agricultural markets, to initiate a move away from subsistence and toward more commercially oriented farming."

- "Land degradation is a critical issue across the basin. It is principally driven by population growth and the consequent pressure on land and on natural resources. Deforestation and poor land husbandry contribute to the degradation."

Hence, there is awareness at the government level of the issues related to sustainable lake basin management. It is important that the authorities acknowledge the limitations that the water resources pose on the development of the agriculture. As the Ministry of Finance and Economic Development has put focus on horticulture as one of the key economic development sectors, a decline in potential for horticulture (e.g. due to depleted irrigation resources) is also of large interest for the Ethiopian government. State governments of Oromia and SNNPR also are concerned with the topic as Ziway area has been identified as one of the key areas for horticultural development.

At present it is allowed to freely dig a well by hand and pump water. For irrigation systems that require machine digging for pumps, a permit is required. This permit is issued by RVLBA.
Permits for establishment of businesses (including agricultural activities) are issued by Oromia State Investment Commission / South States Investment Commission or Federal Investment Commission. Larger farms (over 0.5 ha) require a business permit while smaller farms (under 0.5 ha) can start farming at any location without requiring any special permit.

Country-wide, Ethiopia has a potential of 5.3 million hectare arable land that can be cultivated through irrigation water. Presently only 5% of this area is irrigated. Hence, Ethiopian government considers expansion of irrigation a cornerstone of the agricultural development of the country that holds the potential of moving up to 6 million households into food security while mitigating negative impact of climate change, alleviating poverty and contributing Euro 4 billion to the economy. Irrigated horticulture in particular is strongly supported as a means to increase foreign exchange earnings and employment.

Currently, a national policy is being developed with regard to water tariffs. At the same time, stand-alone plans for introduction of revenue-based water revenue models are being put in place at some of the critical locations. Awash basin has already started implemented water tariffs and RVLBA developed a roadmap for the Water Allocation Plan (WAP) in 2016-17, with support of Dutch partners Wetlands International and IDH. Before implementation, any WAP needs to be approved by the Basin High Council and the Ministry of Water.

2.2. Stakeholder analysis

Effective stakeholders' engagement allows the public authorities to intensively involve water users in planning, decision making and evaluation of water allocation planning and water sharing. To develop an effective engagement plan, the stakeholders in the Ziway-Shalla basin have been assessed and categorised according to their interest, role and influence.

The key stakeholders are listed in the following table. A broader group of stakeholders, which has been identified during the project preparation, is briefly described further below. The Water Allocation Planning process is intended to be managed by three committees (currently being established), namely Steering Committee (for overall supervision), Technical Committee (technical validation and advising) and Strategic Committee (institutional embedding of the WAP).

Stakeholder	Role	Interest	Position	Influence
Water users: Smallholder irrigation farmers and farmer groups	Beneficiaries, consumers	High	For (close to lake), ambiguous (further away from lake)	Medium
Water users: Agricultural companies	Beneficiaries, consumers	High	Ambiguous	Medium
Water users: Lake fishers	Beneficiaries	Medium	For	Low
Water users: livestock and other smallholder farmers	Beneficiaries	Medium	Ambiguous	Low
Community user groups, women user groups	Beneficiaries	High	Ambiguous	Low
Ministry of Water Irrigation and Electricity	Decision-maker, financer of RVLBA	High	For	High

Ethiopian Wildlife Conservation Authority	Decision-maker	Medium	For	Medium
Ministry of Environment, Forest and Climate Change	Decision maker	Medium	For	Medium
Oromya State Government (Water Bureau)	Decision-maker	High	Ambiguous	High
Oromya Irrigation Development Authority	Decision-maker	High	For	Medium
SNNPR State Government (Water Burau)	Decision-maker	High	Ambiguous	High
Local level authorities (zone, woreda)	Decision-maker	Medium	Ambiguous	Medium

Stakeholder 1: Water users – Smallholder irrigation farmers

Smallholder irrigation farmers have a strong interest in the preservation of the water resources in the Ziway basin, as water is one of the key production inputs for their activity. Its availability is equally important to all irrigation farmers, disregarding their location. But, the impact of declining water quantity is clearly felt on some locations earlier than on others. So, there is a diversity of farmers' views towards water allocation and water tariffs.

During the WAP stakeholder engagement process, all irrigation farmers will be represented. On top of that, 4,000 will be direct beneficiaries of the project (through pilot, training or awareness workshops).

Smallholder irrigation farmers do not have formal responsibility for water resources. As water has always been a common good that could be taken for free, farmers have just been doing what was logical for them. Through this project, they will be assisted to understand the consequences of their actions for the whole lake basin and for the longer term.

As this project aims to introduce water fees, it is expected that farmers will be reluctant to endorse this model. It is less favourable for them, cost-wise. Therefore, a lot will be invested in the stakeholder consultation process and in helping the farmers to increase their yield and income, so that the increase in cost of water will not be felt. During the project preparation it has become clear that farmers who are already suffering water shortages, are more in favour of the project that those that still have ample water at their disposal. Some farmers have already stopped any farming activities during the dry season due to the absence of water. These farmers are eager to support a more equitable water allocation and sharing in the basin.

As mentioned, smallholder irrigation farmers have no formal decision-making power about the water allocation, but as the largest user, they are an important group to consider while designing the allocation model. Their collaboration is essential to support general acceptance and uptake of the model among farmers and other water users. As the majority of the irrigation farmers are members of Meki Batu Union through their cooperatives, the union will be required to motivate its 152 member cooperatives to take part in the water allocation planning process and represent their farmers as water user groups.

Stakeholder 2: Water users – agricultural companies

There are several larger agricultural (Castel Wineries, Sher) and livestock fattening companies in the Ziway region that will be involved in the process. They all have long-term interest in sustainable water supply. Due to their size, they already operate on basis on water permits. Most have already invested in water efficiency measures and some of them also have introduced artificial wetlands for natural filtering of waste water. At present, however, they do not pay for water and are interested to achieve an agreement that ensures sustained water supply under financially reasonable conditions.

Agricultural companies will be supported to participate in the stakeholder convening process towards equitable water allocation and sharing. IDH has already been working with various companies in the region and as such IDH is interested to continue supporting this stakeholder group. Furthermore, EHPEA (Ethiopian Horticultural Producers Exporters Association) has also expressed its commitment to support the members from the Ziway area to improve their water efficiency. Hence, this group of water users will be given ample opportunity to express their opinion and contribute to a joint solution to the water

problem. Lack of cooperation from larger agricultural companies would be a serious challenge for the project as at the end both smaller and larger users are expected to endorse the allocated water volumes and water fees, and install water meters at their premises. Letters of Intent from EHPEA and Castel Wineries, expressing their support for the project, are attached in annex.

Stakeholder 3: Water users – Lake fishers
This group is interested in the improved water quantity and quality as their livelihoods depend on the fish stock in the lakes. They will be involved in the water allocation planning process but it is not expected that the outcome will have direct influence on their activities. For them it is important that the water balance is established so that fishing can be sustainably practices for the long term.

Stakeholder 4: Smallholder farmers (livestock, rainfed, mixed farms)
Majority of farmers around lake Ziway are smallholder farmers practicing rainfed farming and keeping livestock. For their livestock, they have clear interest that there is sufficient water available. For their farming, the quality of the soil is of importance. Due to unsustainable practices, causing erosion of the land, many small farmers grow their maize, sorghum or teff on low quality soil, which impacts their productivity. The erosion causes siltation of rivers and lakes, reducing the water buffer capacity of these water bodies during dry periods. This group is therefore an important part of the solution to the water problem in the Ziway area. The project will support them to introduce anti-erosion measures, both on farm and on community level.

Stakeholder 5: Community user groups, women user groups
Some of the communities in the Ziway basin are organised in water user groups. These groups have been a partner for interventions already undertaken by RVLBA and / or various donors. The existing groups will be invited to participate in the water allocation process. A separate representation is envisaged for women user groups. Through their involvement, community based activities will be implemented and accepted more easily, hence they will be an important partner for the work package related to watershed restoration.

Stakeholder 6: Ministry of Water, Irrigation and Electricity
This Ministry is critical for the successful implementation of the integrated lake basin management in the Ziway-Shalla area. Ministry of Water has established basin authorities, among which RVLBA, which is the key public partner on this project. RVLBA is also still largely financed by the Ministry of Water, hence its financial sustainability is partially dependent on the decisions of this Ministry.

RVLBA has the mandate from the Ministry of Water to establish water-revenue based model of operations in the Ziway-Shalla basin. The activities of RVLBA, and hence the project activities, need to be well coordinated with the Ministry, so that project interventions are aligned and supportive to the interventions and regulations introduced nationally.

Ministry of Water has committed financial resources to RVLBA for the coming years, but this concerns only the basic funding for the organisation and some project-based funding (such as for the development of WAP and for the sub-basin management plan). RVLBA is expected to attract additional funding and ensure that water revenues are collected from water users. During the project, Ministry of Water will be an important decision-making partner that will be frequently informed and intensively involved in the water allocation planning.

Stakeholder 7: Ethiopian Wildlife Conservation Authority
This governmental body is responsible for the conservation of wildlife natural resources and is as such interested in conservation of water resources in the Ziway basin, particularly in relation to water birds. Abijatta-Shalla national park is the most important lake for waterbirds, including over 100,000 flamingos, which are currently threatened due to declining water levels. So, this authority will take part in the stakeholder process, representing the water users that otherwise would have no voice.

Stakeholder 8: Ministry of Environment, Forest and Climate Change
This national ministry, responsible for environment, forest resources and climate change related strategy and plans, will be involved in the stakeholder engagement process as policy maker and expert advisor. The Ministry has a concern regarding the environmental impact of different development

activities in the Ziway basin. Water allocation plan needs to be aligned with the activities that this Ministry undertakes regarding the natural resources conservation in the Ziway area.

Stakeholders 9 and 11: Oromya State Government (Water Bureau) and SNNPR State Government (Water Bureau) are interested in water resources management in their respective states. In this regard, it is important that the division of responsibilities between the federal and state level is clearly defined. Both entities will be a part of the stakeholder process, with Strategic Committee of WAP in charge of bringing on board all relevant public stakeholders.

Stakeholder 10: Oromya Irrigation Development Authority
This state-level government body oversees promoting irrigated agriculture as a means to achieving economic development and export revenue. Irrigation Development Authority has identified Ziway region as one of the key horticultural regions in the state and has been promoting the sector in the past years. This authority will be closely involved in the stakeholder engagement process as the success of the water allocation and sharing plan will depend on the number of users that are allowed to operate in the region. Water allocation will be based on the current level of water use, hence allowing many new farmers and businesses to establish irrigated horticulture activities in the region will create a new imbalance. Strategic Committee of the WAP, in charge of convening with key public partners, is expected to establish close cooperation with the Oromia Irrigation Development Authority and ensure sustainability of the water allocation and sharing arrangements. Letter of Intent from the Authority is attached.

Stakeholder 12: Local level authorities (zone, woreda)
There are eight administrative zones and one special woreda in the sub-basin namely: Guraghe, Silte, Sidama, Hadiya zones, Alaba Special Woreda of SNNPRS; Arsi, East Shoa, South West Shoa, West Arsi of Oromia. Water Bureaus of each zone will be a partner for the stakeholder consultation process. Other public entities on zone level will be included in the broader circle of stakeholders.
22 woredas of Oromia are fully or partly located in the Ziway basin: Dugda, Bora, Tena, Shirka, Lude hetosa, Enkelo wabe, Kersa Malima, Kone, Gedeb Asasa, Admi-Tulu Jido Kmbolcha, Arsi Negele, Munesa, Limu Bilbilo, Ziway Dugda, Hitosa, Shalla, Shashemene, Tiyo, Kofele, Kore, Seden Sodo, Sodo Dacha, Degeleno Tijo and Siraro. Moreover, there are 17 woredas of SNNPRS that are fully or partly located in the sub-basin. These are Mareko, Meskan, Sodo, Muharna Aklil, Sheshego, Malga, Wendo genet, Sankura, Misrak Azernat Berebere Wibaneg, Gumer, Gedebano Guzar, Kokir Gedebano, Silti, Lanfero, Dalocha, and Alich. Relevant authorities are: woreda council and administration office, and woreda government offices.

Other stakeholders to be involved in the stakeholder consultations for WAP and other project activities, as appropriate, are:

- Stakeholders at federal and national level (line ministries and institutions): Ministry of Agriculture & Natural Resource, Ministry of Industry, Ministry of Mines, Petroleum & Natural gas, Ministry of Culture & Tourism, Ministry of Livestock & Fishery Resource Development, Federal Investment Commission, Institute of Bio-Diversity, Ethiopian Wildlife Conservation Authority, Ethiopian Agricultural Research Institute, Federal Cooperative Promotion Agency, Ethiopian Horticulture Development Agency, National Meteorology Agency.
- Other zone level public stakeholders: Agricultural and Natural Resource Departments, Rural Land Administration and Use, Water Resource Development Departments, Mine and Energy Departments, Departments of Trade and Transport, Departments of Industry and Urban development, Culture and Tourism departments, Town Administration, Water supply offices.
- Kebele level stakeholders are kebele administration offices, Development committees, agricultural development offices, cooperation promotion agents, kebele health offices.
- Research Organisations and Universities working on various studies and researches in the sub-basin will be consulted during WAP preparation and implementation. Their representatives will form the Technical Committee that will support and validate the WAP. The stakeholders are: Ethiopian Agricultural Research Institute, SNNPRS Agricultural Research Institute, Oromia Agricultural Research Institute, Ziway Fishery and Aquaculture Research center, Adami Tulu Agricultural Research Center, Hawassa University, Adama University, Assela University, Dila university, Arba Minch University, Werabe University, Welkite University, Wachamo University and Addis Ababa University including HoAREC&N.

- Other water users:
  - Domestic water users are rural and urban water supply users.
  - Industrial water users: Water bottling factory, Assela Malt barley processing factory, Abijata Soda Ash factory, Adami Tulu Pesticide factory and others.
  - Recreational and Tourism: Abijata Shala National Park, about 12 resorts, lodges and other recreational centres mainly surrounding lakes Ziway, and Langano.
- National and international organisations and NGOs: GIZ, IWMI, WatGWP, RCWDA, Selam Environmental Development, Forum for Environment, OSHO, ODA, WB, AfDB, UNESCO, UNDP.
- Professional associations, religious and community based organisations: Ethiopian Biological society, Ethiopian Wildlife and Natural History Society, Environmental Society, Public Health society. Furthermore: Ethiopian Orthodox Church, Catholic Church, different protestant churches, Ethiopian Islamic council and others with their local and grass root branches will be helpful in awareness creation and mobilising their respective communities to protect and sustainably use water and the natural environment. Community based organizations such as youth and women associations, traditional informal organizations (Idir, Mehiber, village/gote leaders, Abba Gaddas and others) will support with mobilisation and awareness activities.

2.3. Problem analysis

IRRIGATED AGRICULTURE IN ZIWAY BASIN

Ziway-Shalla sub-basin is a closed system containing four large lakes – Ziway, Abijatta, Shalla and Langano, and various rivers, of which Meki and Katar are the largest. As a closed system, its water balance is very sensitive to changes in water inflow and outflow. Only one lake in the system, namely Ziway, is a fresh water lake.

Due to the increasing demand for vegetables in the rapidly growing Ethiopian urban centres such as Addis Ababa, Debre Zeit and Awassa, farmers in the Ziway basin, both big and small, have increasingly engaged in horticultural production in the past 10-20 years. Vicinity of fresh water has made small scale irrigation possible while the absence of regulations contributed to an uncontrolled growth of the irrigated area. For small farmers, addition of vegetable cultivation to their cereal farming and livestock keeping activities has meant higher income. Hence, a strong horticultural sector has arisen in the fertile area around lake Ziway, contributing to improved living standard, economic growth and strengthening of the market centres such as Meki and Ziway. Horticultural farmers in the Ziway area are joined in a strong and vibrant Meki Batu cooperative union that further enhances market opportunities for its members.

The consequences of increased irrigation for the ecosystem have become obvious already over ten years ago. Ethiopian government conducted various assessments since, attempting to estimate the actual water abstraction by agricultural users and the limits of the Ziway-Shalla sub-basin. In 2007, Wageningen University delivered a technical report "Land and water resources assessment in the Ethiopian Central Rift Valley", asserting that, based on average volume of 20,000 m3 of water per hectare and year, 150 Mm3 was drawn from the system by small agricultural farmers. Other users combined (domestic, livestock, industrial) used about 10% of that quantity. The report further stated: *"The total discharge from the Meki and Ketar River is, on average, 675 to 695 Mm3 per year. The average level of Lake Ziway has decreased by approximately 0.5 meter since 2002. At the same time the discharge by the Bulbula River has decreased from more than 200 Mm3 per year in average years to less than 50 M m3 in 2003 and 2004. The reduced inflow into Lake Abijatta has caused a reduction of the size of this lake to less than 60% of its original size. The decreased discharge into the Bulbula River corresponds with the development (in the order) of 7500-10000 ha of irrigated land."*

More recently, RVLBA has assessed irrigation pumps (unlicensed users) in the key irrigation areas of the Ziway basin, offering the following data:

No.	Irrigation site	No of pumps	Water use/year (m3)	Irrigated land (ha)
1	Lake Ziway irrigation (Dugda district)	3,704	24,180,868	4,067
2	Lake Ziway irrigation (Ziway Dugda district)	814	3,720,135	1,426
3	Lake Ziway irrigation (Ziway town)	38	7,199	59
4	Bulbula river irrigation site	574	2,079,879	89
	Total	5,130	29.99 Mm^3	5,641

The Master Plan developed by the Ethiopian Ministry of Water Resources in 2009 established that not more than 6,750 ha should be allowed as irrigated areas in the Ziway-Shalla sub-basin. At the time, the Ministry estimated the total of irrigated area in the Ziway basin at 7,156 ha. According to satellite observations, the area under small-scale irrigation in the region is closer to 10,000 ha, resulting in at least a double quantity of water drawn from the basin (60 million m3). Another study[10] estimated water abstraction from the lake Ziway at 25 million m3 for irrigation of about 2,000 ha (so 100 million for current estimated irrigated area). On top of small scale irrigation, various larger (licenced) users, such as big floriculture companies, extract water from the catchment. Estimates vary from 10 to 85 Mm3 per annum.

So, although the exact updated figures of water abstraction by different users are not yet readily available, it is clear by observation on the ground and by satellites, that irrigation farmers are key water users in the basin. RVLBA, IDH and Wetlands are currently commissioning a water potential and demand study for the Ziway-Shalla basin, which will review past studies and provide consolidated data, accepted by the stakeholders. This study will be completed by the end of 2018. For the purpose of this project, a figure of 147 Mm3 of water abstraction by smallholder farmers is used for further calculations (21,000 m3 per year based on three growing seasons).

Growth and Transformation Plan 2010-2015 of the Ethiopian government placed irrigation development and improving water use efficiency with preservation of natural resources in the centre of agricultural development of the country. Over the last years, farmers have benefitted from increasing availability of pumping machinery, but no incentives were put in place that would support water efficiency measures. Consequently, the predominant irrigation method at smallholder growers in the Ziway basin is flood or furrow irrigation, which is by far the least water-efficient irrigation method available. Irrigation water use efficiency in the Meki Batu irrigation scheme has been estimated by PRISM (2004) and Wageningen study mentioned the efficiency rate at about 30%. On top of contributing to water resources depletion, flood irrigation washes off top soil, drenches the roots of young plants excessively and fosters leaching of harmful substances into the ecosystem. When diesel-pumps are utilised, flood irrigation also increases the production costs for the farmer and contributes to CO2 emissions.

Inefficient use of water, however, is not the only inefficiency in smallholder horticulture. Due to the lack of technical knowledge, farmers apply fertilizers as they think appropriate, which is in general much more than the recommended rates (as evidenced by the high N and P content of the farmers' plots). With regard to agro-chemicals, only cheap broad-spectrum pesticides and insecticides are available to smallholders; high frequency of application indicates that many plagues and diseases are already resistant to these treatments (Putter et al. 2012b). Although professional companies are offering improved seedlings, small farmers still mainly use traditional OP (open pollinated) varieties. So, as long as small farmers have not improved their production methods and achieved higher yields and accompanying income, they have little room to invest in water efficiency.

In the Ziway basin, common bottlenecks for improvements of irrigated horticulture, as perceived by Meki Batu cooperatives, are: 1) limited availability of cash to purchase all required materials, 2) limited capacity of the service sector to provide adequate services and 3) limited capacity (knowledge / skill) and risk aversion of farmers, hampering investments required to move towards more 'high-end' production methods including micro-irrigation.

So, the main challenge for the sustainability of the water resources in the Ziway basin is to stop the uncontrolled use of irrigation water for horticultural crop production (and other purposes) whilst at the

[10] Assessing the Impact of Existing and Future Water Demand on Economic and Environmental Aspects (Case Study from Rift Valley Lake Basin: Meki-Ziway Sub Basin), Ethiopia, Abebe Guadie Shumet and Kassa Tadele Mengistu, Arba Minch University, Ethiopia

same time not undermining the livelihoods of the increasing number of smallholder farmers and the private companies operating in the Lake Ziway area.

WATERSHED FARMING SYSTEMS

Four main production agricultural production systems have been identified in the Ziway area, as described in the Context analysis. By far, the majority of farmers in the region are engaged in mixed farming systems, combining rainfed agriculture and livestock keeping. These farmers are not involved in irrigated horticulture, but they do contribute to the deterioration of the natural resources. The two most widespread unsustainable practices in the upland farming are 1) agricultural practices that support erosion (such as lack of terraced fields) and 2) livestock overgrazing, leaving the soil bare (with increased wind and sheet erosion, and evapotranspiration consequently). Cutting trees for wood fuel and other purposes further facilitates erosion, contributing to the silting up of the lakes and their tributary rivers. So, while increased irrigation decreases the water volume in the lakes, increased sedimentation leaves less room for water. This might sound like a good match, but unfortunately it is not the case: composition of water changes with the depth of the lake, creating conditions for higher pollution and nutrient levels, higher temperature and lower oxygen levels. This impacts the water quality, with negative consequences for various water users.

Watershed farming communities, which are in the rule poor and more vulnerable than those around the lake, are not in the position to invest in a more sustainable ecosystem by themselves. Various interventions are conceivable, both on farmer and on community level, but neither individual farmers nor rural communities can realise them unsupported. Interventions vary from planting (fruit) trees, creating contour bands, mulching to increase carbon content of the soil, filling up the gullies, developing livestock grazing schemes and reducing logging pressure by energy saving stoves. As the continuation of current, erosion-sustaining agricultural farming and the subsequent soil degradation will spiral towards further decrease in yields and income, there is a good reason for farmers to embrace more sustainable farming methods. Again, the lack of knowledge and resources are the key impediments for faster implementation of conservation interventions.

INSTITUTIONAL FRAMEWORK

As water is considered a common good in Ethiopia, until recently there have been no limitations for the abstraction and use of water for any purpose. Such traditionally imbedded attitudes are hard to change. However, Ethiopian government has realised that at various locations, water resources are in danger due to excessive use, which is the consequence of the traditional practices. So, from its side, the Ministry of Water, Irrigation and Electricity has established entities with the specific mandate to sustainably manage lake basins that are the most vulnerable. In parallel, various local and international organisations and associations have started working towards improved practices at different levels, all aiming to restore the water balance in the areas that have been affected.

With the establishment of the RVLBA as an autonomous government body, the legal and institutional framework for a balanced water use and sustainable management of the basin resources were put in place. In terms of implementation, however, the momentum and the capacities for the execution of the RVLBA mandate are lacking. As a young organisation, RVLBA is looking to improve its resources and capacities for water allocation and sharing, and for integrated lake basin management. The organisation requires a solid data collection and management department, that will monitor water quantity and quality, interpret the data and take appropriate action. Furthermore, a financial management system is needed for collection of water fees and allocation of revenues to various watershed improvement and basin management tasks.

ZIWAY BASIN STAKEHOLDERS

RVLBA is aware that the distribution of the available water resources must be based on reliable data on water availability and water requirements by the different user groups. To this end, RVLBA has, with

Wetlands International, IDH and other partners, developed an action plan for water allocation. To manage a new water allocation plan and introduce a payment-for-water system, a transparent and open dialogue between public and private partners needs to be established. It is only on the basis of a common understanding and balancing of interests between the business and public sector that the planned development and implementation of the Water Allocation Plan (WAP) can be achieved.

The multitude of stakeholder has been described in the previous section. Although most stakeholders are aware of the deterioration of the natural resources in the lake Ziway area, introducing a paid water system will require a strong and coordinated effort with building of mutual trust between different parties as one of its key objectives. RVLBA is eager to lead this process but has limited capacity for stakeholder engagement.

In summary, this project aims to tackle four interlinked problems contributing to the depletion of water resources in the Ziway-Shalla sub-basin, namely:

1) Uncontrolled and inefficient irrigation practices by smallholder horticultural farmers,
2) Inappropriate institutional framework for management of basin resources;
3) Lack of organisation structures and capacities at the basin authority level;
4) Unsustainable agricultural practices at upland farms and subsequent catchment degradation.

Although more factors contribute to the problems in the Ziway basin (e.g. industrial pollution of the lake, uncontrolled livestock movement, demographic growth), not all of them can be tackled by this project. What the partners for this project propose, is to address the most urgent issues contributing to the decrease of water quantity in the basin, so that the water balance is restored. The methodology for the project ensures sustainability of the results, both on the level of users and on the institutional level, so that by the end of the project conditions are created for further rollout of the water allocation plan with all stakeholders and integrated lake basin activities.

IMPACT
The problems described above have direct and indirect impact on economy, livelihoods and the environment. Key consequences of the continuation of the current situation are:

For economy and livelihoods:
- Smallholder agriculture declining, income decreasing;
- Withdrawal of agricultural companies, loss of jobs;
- Fisheries declining, lower income from fisheries;
- Loss of (potential for) tourism / recreation;
- Declining drinking water resources, increased burden of water fetching for women.

For ecology:
- Loss of wetlands for migratory birds;
- Loss of fish and mammal populations;
- Loss of bush land habitat.

3. Project purpose

The development goal of this project is twofold:

- To ensure a balanced Ziway-Shalla Basin ecosystem with a sustainable and transparent water usage and distribution system.
- To improve water security and income of agricultural producers, particularly small farmers and women, in the lake Ziway catchment area.

As elaborated in the Project definition section, current level of water abstraction from the closed Ziway-Shalla sub-basin is not sustainable. Continuation of the 'business as usual', therefore, will result in the

drying up of the lakes with substantial deterioration of economic activity, loss of income and increase in poverty and food insecurity on one hand, and loss of biodiversity on the other.

This project aims to address the most urgent problems that need to be resolved to bring the system back in balance. By the end of the project, conditions will be created at institutional and user level for the recovery of the basin in a sustainable, transparent and equitable way.

As irrigated horticulture has played an important role in the intensified water abstraction from the basin, this sector also holds the key to bring the system back to balance. With horticulture being a focus sector of Ethiopian economic development, and its demonstrated positive impact on small farmers in the Ziway area, any interventions in horticultural farming must consider its role as income generator for the local population. Hence, this project aims to achieve water balance in the basin while preserving and even improving the income of horticultural farmers. Through interventions in improved production systems based on a sound business model, farmers will be able to earn higher income, pay water fees, decrease water usage and contribute to richer and more productive natural resources. The business model based strategy is essential for the collaboration of farmers and the sustainability of the proposed intervention.

Sustainability of the project results is embedded in the participation of the lake basin authority as a project partner. RVLBA has the mandate and the responsibility to ensure fair and balanced water allocation and sharing in the Ziway basin, and to maintain the natural resources responsibly. Upon project completion, RVLBA will further rollout the water allocation strategy that will be developed and piloted through this project. As the revenue-based model has been endorsed by the Ethiopian government as the appropriate model for water resources management in the country, RVLBA has the institutional support required for the implementation of water permits and fees.

The problem and objectives analysis is summarised in the problem tree in annex 8.

The project contributes substantially to a game-changing development in Ethiopian water resources management and is as such aligned with the ambition and the objectives of the FDW programme. Its results are the first step towards wider implementation of a revenue-based water management that will enable an important Ethiopian ecosystem to maintain its environmental diversity and economic potential. As the model requires a change in attitude of the stakeholders and a shift in production methods of small farmers, the partners have developed a business model and a support system that is suited for small farmers, including women-led farming households. The project contributes to the realisation of the development goals of the FDW programme, i.e. Focus on development and Sustainability. It supports inclusive green growth, sustainable use of natural resources and conservation of ecosystems. By safeguarding and increasing the water buffering capacity of the basin, it is a key initiative for the basin to adapt to climate change. To ensure sustainability, the project takes an integrated approach to water management, including a broad stakeholder consultation.

The project is also in line with the strategy of the Dutch Embassy for Ethiopia, which has been supporting river basin management in Central Rift Valley, where Ziway basin is located. Ziway area is also an important horticultural production hub, which aligns with the Dutch focus on horticultural sector (among others). Water use efficiency has also been identified as one of the topics where Dutch knowledge and experience are relevant, which can be confirmed by the Dutch partners that are bringing their expertise into this project. Given the fact that Ethiopia is sensitive to climate change, with severe consequences for livelihoods and food security, there are opportunities for a stronger Dutch involvement in both river basin management and water efficiency. As the Multi Annual Strategic Plan for Ethiopia 2014-2017 states, "the capacity to implement the ambitious developmental agenda of the Ethiopian government is often lacking". This is the case at Ethiopian basin management organisations, which are young but have a large and important task ahead. There is ample expertise in the Netherlands regarding sustainable integrated water resources management that can be utilised to enhance Ethiopian institutions involved in this area.
This project will furthermore contribute to the Dutch Embassy objectives of increasing agricultural productivity, participation of women and competitiveness of agribusiness.

4. Project strategy

Wetlands International and its partners have developed a proposal for a four-year project that aims to solve some of the key challenges of the Ziway basin. As a complex ecosystem with various functions and with a multitude of stakeholders that contribute to, and / or use its natural resources, the basin copes with complex challenges. To restore the basin to its balance will by no means be a simple task.

Hence, the strategy chosen by the project partners focuses on the most urgent issues that will at the same time have the largest impact, creating conditions for further scaling of the interventions. As described in the Problem definition, the partners have formulated the key issue in the basin being 'declining quantity and quality of water in the lakes Ziway and Abijatta'. If this trend continues, negative consequences for the livelihoods, economy and the ecology will be large and difficult to deal with. So, the key interventions of the project are designed to reverse the trend and ensure that more water flows into the lakes.

Although various reports differ in their assessment of water abstraction by different users, they all state that irrigated horticulture is the largest water user in the area. Based on that reality, it is the priority to curb the water use of this group. Therefore, one of the work packages focuses fully on improving horticultural farming, including improved water efficiency. The activities are geared towards increasing the productivity through improved farming practices and demonstrating to farmers that more sustainable farming earns them a higher income, while ensuring that there is and will be enough irrigation water now and in the future. This activity can be considered a precondition for the successful implementation of the Water Allocation Plan by RVLBA.

Smallholder farmers are, however, just one of the many water users in the region. To ensure that all users are aware of the deteriorating status of the basin, and cooperate on the introduction of the new water-revenue based basin management model, a broad stakeholder consultation process will be supported through this project. Large agricultural companies, industrial users, livestock farmers, watershed farmers, fisheries and the tourism sector will be a part of the process.

Aiming at restoring water quantity and quality, the project partners have realised that a part of the activities needs to focus on combating erosion. So, one of the work packages will focus on working with farmers in watershed areas and introducing anti-erosion measures that will benefit the farmers and the ecosystem. As upland farmers experience less direct consequences of declining water quantity and quality, it is essential that awareness is created in these communities regarding the broad impact of their actions. Interventions for the project are selected with the aim to address the most critical erosion sites, to be practical and generate clear benefits for farmers, enabling replication.

Two of the work packages are designed to support the basin authority RVLBA to strengthen its own organisation and capacity, and to develop the water allocation plan to be the basis for its further operations. As mentioned, RVLBA intends to establish a system of payment for water use in the basin, which is new for the basin and only the second such initiative in Ethiopia (the first has been implemented in Awash basin). As such, it requires thorough preparation and a strong organisation. So, the Dutch expert partners will support RVLBA throughout this process, taking on board experiences from the Awash basin, with the aim to leave a technically well-equipped, capable and professional authority behind after the project completion.

The proposed four work packages will deliver results on institutional and user level, while creating broad stakeholder understanding of the issues and the interventions to come. By the end of the project, the business model for horticultural farmers will be demonstrated at different locations, water meters will be installed at the pilot group of farmers and watershed (anti-erosion) interventions will be implemented. Less water will be abstracted from the system and the basis will be laid for decreasing sedimentation levels. Although this project will positively impact the water quality thanks to more responsible fertiliser and pesticide application, and sediment loads, improving water quality is not the key objective of the project. It is a topic that should be tackled by RVLBA separately, but thanks to the investment in water monitoring infrastructure and data centre to be made by the project, RVLBA will be better equipped to work on the quality issues in the follow-up phase.

4.1. Sustainability strategy

The project partners will ensure that their CSR policies are developed and / or updated, and implemented during the project.
As a globally-operating organization, Wetlands International already has a formal accountability policy, wherein the CSR topics such as transparency, human rights, anti-corruption policy, ethical policy and gender policy are included, among others. In its strategic focus, Wetlands International is also fully dedicated to sustainable use of wetlands.
The main objective of Acacia Water is to deliver socially relevant but commercially viable services in the water sector. Acacia has a contemporary vision on sustainability, by actually putting it into practice, both within mainstream projects but also through own initiatives, such as 'Acacia Institute', which provides hydrological knowledge and sustainable groundwater management for interested parties in the Netherlands and abroad.
Meki Batu union also is committed to responsible business practices. The union allocates 5% of its turnover to meeting social needs in the wider communities around Meki, Adami Tulu, Marako and Awassa. Meki Batu has also started introducing GlobalGAP standard at its members.
Joytech holds several quality and food safety certificates, among which GlobalGAP, BRC, Tesco Nurture and Field2Fork. It has also complied with GRASP (GLOBALG.A.P. Risk Assessment on Social Practice), which assesses social practices on the farm, addressing specific aspects of workers' health, safety and welfare.

FINANCIAL SUSTAINABILITY
Financial sustainability of the project results is based on three mutually reinforcing business cases:

1) At the institutional level, RVLBA will define a modality of operations that is mainly based on water revenues. These revenues, to be collected from different water users based on water metering at fixed tariffs per m3, will cover the operations and maintenance costs of the organisation. Basic budgetary support from the Federal Government will continue in the short to medium term.
2) At the private sector level, Joytech as private sector partner and a commercial supplier of quality vegetable seedlings, will establish its presence in the Ziway area, which is an important horticultural hub of Ethiopia and as such, an area with good market potential for the company. Based on the demonstrations and training to be done during the project, Joytech will develop a client base that will sustain the company's activities in the future on commercial grounds.
3) At the beneficiary (smallholder farmer) level, a business case will be demonstrated, showing the benefits in terms of yield and income based on a) improved planting material, b) more efficient irrigation and c) improved farming techniques with more efficient use of fertilisers and agro-chemicals & reduced erosion and d) improved market access.

RVLBA, as the public authority of the Ziway basin, is assigned the task of developing a self-sustaining organisation that will ensure long-term sustainability of the water resources of the region. At present, however, RVLBA does not have the resources and the capacities for revenue-based basin management. This management modality is endorsed by the Ethiopian federal authorities as the preferred modality for the future development of water resources management. A water tariff plan is currently being developed on the national level, but the Ministry of Water, Irrigation and Electricity encourages basin authorities at the most important basins to introduce water tariffs as soon as possible. Hence, the project needs to follow the developments of the national tariff plan so that its activities will remain aligned. The planned national tariffs and the experiences from the Awash basin, which has already introduced water tariffs, have been used for developing the initial model for Ziway-Shalla.

As abstraction of water by small farmers is currently free of charge, the largest task ahead is the change of attitude so that farmers understand the need for responsible water use and accept the water tariffs as means to secure water resources for the longer term. The strategy of the Ethiopian government regarding farmers is to introduce affordable water tariffs – the current proposition (not yet approved) stipulates a tariff of 0.03 Birr per m3. The tariff piloted in the Awash basin was even ten times lower, but it is presently under revision. So, the revenue model for the Ziway-Shalla basin is based on the tariff of 0.03 Birr per m3 for small irrigation water users. Other tariffs, also drawing from the draft tariff plans of the Ministry of Water, are 0.02 Birr for larger irrigation users and 2 Birr for industrial and other users. As water fees are new for Ethiopia, the project partners will implement a water tariff study prior

to the finalisation of the model and the introduction of the fees to consumers, with a primary focus on irrigated agriculturalist (both small holders and larger agrifirms).

In the Ziway basin, an estimated 147 million m3 of water is abstracted annually for irrigation purposes by smallholder farmers. This represents an area of 7,000 ha under irrigation that is farmed by about 14,000 farmers with 0.5 ha of irrigated land on average. Based on the average improvement of water use efficiency of 40%, the quantity of water abstracted by farmers will decrease to 88.2 million m3 per year. Taking the decreased water use into account, RVLBA will generate an equivalent of Euro 107,000 per year from water fees to smallholder farmers. On top of that, RVLBA will charge another Euro 230,000 to other users. With the total annual revenue of Euro 330,000, RVLBA will be able to cover its operational costs and decrease the need for governmental support to Euro 20,000 per year from year 7. A portion of its revenues (Euro 40,000 in the same year) will be used for watershed interventions in the basin.

By the end of the project (year 4), RVLBA will have introduced water meters at 800 smallholder farmers, collecting a revenue of Euro 6,000. In parallel, other users will start to be billed. Governmental budget at this stage is expected to be in the range of Euro 100,000 per year. RVLBA expects to introduce water tariffs at all 14,000 smallholder irrigation farmers before the end of year 7. The P&L account of the basin authority is given hereunder. The full revenue model calculation is attached in Annex 4.

2. P&L forecast (in €)	**Implementation**								
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**
Turnover	104,500	104,500	148,560	204,333	264,083	379,185	357,885	357,885	357,885
Operational costs (excl. VAT):									
Operational costs	-100,000	-146,000	-162,050	-153,153	-209,310	-315,526	-316,802	-318,142	-319,549
Depreciation i	-2,262	-18,429	-22,238	-22,238	-24,905	-28,905	-29,905	-28,976	-27,476
Total costs	-102,262	-164,429	-184,288	-175,391	-234,215	-344,430	-346,707	-347,118	-347,025
Revenue model: EBIT	**2,238**	**-59,929**	**-35,728**	**28,943**	**29,868**	**34,754**	**11,178**	**10,767**	**10,860**
Cumulative EBIT	2,238	-57,690	-93,419	-64,476	-34,608	146	11,325	22,092	32,952

Business case for Joytech is based on one of the company's core business activities – propagation and sales of vegetable seedlings. Joytech has been supplying improved planting material to small and medium scale farmers in different regions of Ethiopia (Dire Dawa, Haramaya (East), Awasa, Dilla, Butajira, Sodo, ArbaMich (South), Bahirdar, Gondar, Raya Valley, Alamata, Kobo, Mohoni (North)). The company is well aware of the constraints of small farmers; hence a training programme is offered to interested farmers that enhances their knowledge and capacity to farm with improved planting material and drip irrigation. The training for farmer groups comprises improved agronomic practices, fertiliser application, plant protection and irrigation management. Joytech expects that its income from sales in the Ziway area in the first year after the project will be in the range of Euro 300,000 – 600,000. Market potential, however, is much higher. Based on the assumption that half of the irrigated area is planted with onions and the other half with other vegetables (tomato, green beans, chilli, cauliflower, cabbage), for which Joytech can provide seedlings, potential income can reach Euro 3 million. This requires 50% of the vegetable farmers to transfer to improved production with Joytech seedlings, representing a total farming area of 1,750 ha. Per hectare, an average of 30,000 seedlings are needed.

Business case for beneficiaries is the cornerstone of this project, as it shows how small vegetable farmers can improve their yield and income while using less water. The business case for the beneficiaries is based on the already proven business models for small scale vegetable growers. In the Ziway area, agricultural farms are between 0.5 and 2 ha on average. Studies surveying vegetable production and income in the Ziway region have shown that farmers generate anywhere between Birr 10,000 and 90,000 annually (Euro 410 to Euro 3,600) from vegetable sales, depending on the size of the farm and seasonal fluctuations of farmgate prices. Out of the total production costs, about 15% is spent on irrigation (fuel costs for irrigation pumps).

Key vegetables grown as an open field crop in the Ziway area are onion, tomato, green beans, chilli, cabbage and cauliflower. Tomato is usually grown by larger farmers who have in many cases already transferred to improved production systems. Small farmers, however, are hampered by financial, technical and cultural factors to make such transformation, while there is good potential for them to increase their income through horticulture. As a rule these farmers already have access to irrigation,

and could double their yields just by using improved planting material and more precise farming methods. All women farmers that engage in horticulture belong to the category of small farmers.

During the preparation of the project, the baseline data for the business model were taken from Meki Batu. Hence, these data do not necessarily represent Ethiopian average for smallholder farms, but are a realistic estimate of the yields and potential for improvement in the Ziway area. During the project, other crops might be added and the business model will be updated. At this stage, calculations for the three most important crops offer sufficient argument for the introduction of improved farming practices at smallholder farms of 0.5 hectare on average. Assumptions and calculations, based on one growing season, are given hereunder and are added to the Annex 4. The main benefits for the commercial and semi-commercial smallholder growers are derived from yield improvements in combination with a reduction of the relative production costs per unit of vegetables produced. In the Ziway area, there are three growing seasons, hence for figures per annum, all needs to be multiplied by three.

PER HECTARE	CURRENT		IMPROVED		
	ONION		ONION	TOMATO	GREENBEAN
Cost of seeds/seedlings (ETB)	4,800		6,240	40,000	7,200
Cost of fertiliser (ETB)	6,000		6,000	12,000	6,000
Cost of agro-chemicals (ETB)	3,000		3,000	28,000	3,000
Cost of irrigation - fuel (ETB)	10,000		7,000	7,000	6,000
Cost of water (ETB)	210		126	126	90
Cost of labour (ETB)	30,000		35,000	40,000	4,500
Other production costs (ETB)	7,000		8,000	8,000	6,000
Cost price/ha (ETB)	61,010		65,366	135,126	32,790
Cost price/ha (EUR)	*2,476*		*2,653*	*5,485*	*1,331*
Sales price /ton (EUR)	*365*		*365*	*325*	*406*
	-		-	-	-
Quantity of water used (m3/ha/season)	7,000		4,200	4,200	3,000
Price irrigation water (ETB/m3)	0.03		0.03	0.03	0.03
Cost or water (ETB/ha)	210		126	126	90
Cost of water (EUR/ha)	8.52		5.11	5.11	3.65

PER FARMER	CURRENT		IMPROVED		
PER FARMER (0.5 ha on average)	ONION		ONION	TOMATO	GREENBEAN
Yield/ha ton	18		26	40	14
Yield/farmer	9		13	20	7
Unsellable 30%	3		4	6	2
For sales ton	6		9	14	5
Farmer income EUR	2,301		3,324	4,546	1,989
Farmer cost EUR	1,238		1,327	2,742	665
Farmer cost for water EUR	-		2.6	2.6	1.8
Farmer net income EUR	1,063		1,995	1,801	1,322

Water efficiency in terms of production volumes achieved per m3 of water will increase substantially thanks to the project intervention: currently 1.25 kg of onion is produced per 1 m3 of water, while after the project, the quantities per m3 of water, of onion, tomato and green bean will be 7.14 kg, 9.52 kg and 4.67 kg respectively. Note that the project will also ensure that fertiliser and pesticide runoff in surface and ground water will be reduced.

INSTITUTIONAL SUSTAINABILITY

Institutional sustainability is anchored in the commitment of RVLBA to the project. RVLBA, being the key public authority mandated and responsible for the management of the Ziway basin, will further develop its capacity for the basin management during the project, while also creating conditions for becoming self-financing in the long run. RVLBA has full support for this project of the Ministry of Water, Irrigation and Electricity, which is the final authority in the area of water management in Ethiopia. Oromia Irrigation Development Authority, as a responsible body for all irrigation development activities in the Oromia state, is interested in sustainable development of irrigated horticulture, and has expressed its support for this project.

Other governmental authorities with a role in the project, as described in the Stakeholder analysis, will be involved in the process of water allocation planning. Ministry of Water, Irrigation and Electricity, as the key public authority for water management, supports the project and will continue its budgetary contribution to RVLBA in the long run.

The project will invest substantially in stakeholder engagement, which is a precondition for the successful rollout of the revenue-based model in the Ziway basin. RVLBA has already established a Steering Committee for the Water Allocation Plan (WAP) together with Wetlands International and IDH, which will have a coordinating and a propelling role in this project with regard to stakeholder consultations. Two additional committees will be established during the project to support the WAP: Technical committee will provide expert advice and validation, while Strategic Committee will engage with various levels of government and large stakeholders. A full-time advisor will be installed by the project to support the Communication department of RVLBA so that the organisation enhances its own capacity for stakeholder management including consensus building and conflict resolution.

Regarding small agricultural users, they are organised in water user groups and / or agricultural cooperatives. The majority of small horticultural farmers are member of the Meki Batu cooperative, which is a partner on this project, and will continue supporting its members in technical and irrigation-related issues. Meki Batu will participate in the consultation process as a farmer union but farmers and their communities will be encouraged to delegate own representatives to the consultation process too. In the upland areas, community (water user) groups and local governments (kebele, woreda) extension officers will play an important role in community-based interventions.

Technical training will be provided by Joytech and Meki Batu to ensure that farmers achieve farming improvements with improved seedlings and efficient irrigation. Following the initial training, Joytech and Meki Batu will establish support structures that will continue providing advice to farmers.

ENVIRONMENTAL SUSTAINABILITY (INCLUDING CLIMATE)
Environmental sustainability of the Ziway-Shalla basin is one of the key long-term objectives of this project. Upon completion of the project, the negative trend of environmental degradation of the Ziway-Shalla ecosystem will be stopped and the recovery will have started. Restoring the ecosystem to a balanced level is a long-term process; the impact of the project interventions will therefore not be fully visible at the end of the project. The root causes of the degradation, however, will have been addressed, enabling continued recovery of the wetlands, water bird populations and other biodiversity.

The reasons for environmental degradation in Ziway basin have been described in earlier chapters. This project will address the most pressing ones, aiming to turnaround the declining water levels in the basin. As human activity has contributed most to this fact, the project focuses in the first place on the largest water users. At the same time, the project will consider the contributions of other users to water abstraction, erosion and sedimentation. An updated study into status of water resources and future water demand (currently being implemented) will enable the partners to finetune the project activities during the project inception. This study will also look into the status of ground water, the current and potential impact of the climate change, population growth, development of the livestock sector and other issues relevant for the Ziway basin.

The project will have no negative environmental implications. Reduced water use in agriculture will go in pair with improved farming practices, which implies more precise, and hence lower, application of fertilisers and agro-chemicals.

The project does not require additional environmental surveys or permits. RVLBA as the responsible authority issues permits for larger irrigation projects and will include smaller irrigation pumps in the monitoring system through this project. Furthermore, rules for use of water will be laid down in the WAP, providing clarity on permits and fees to any current or future water users.

In the long run, RVLBA will be able to collect sufficient income from water revenues to continue investing in watershed activities and water efficiency. It will be important to embed this in RVLBA annual plans so that further sedimentation of the lake is put to a halt.

Abijatta-Shalla Lakes National Park holds is an important habitat for numerous water birds and several mammal species. They have been in the decline as well during the past decades due to decreasing water levels, salinization and overgrazing. This project aims to create conditions for the return of birds and animals, and for their long-term sustenance in this area.

TECHNICAL SUSTAINABILITY
Technical sustainability of the project will be ensured through the introduction of situation-appropriate technology and training of various stakeholders. New technology will be introduced at two levels: 1) at RVLBA and b) at small horticultural farmers.

For RVLBA, it will be important that its newly established quality and data monitoring facilities are suitable for the scope of its activities, and that its staff is sufficiently trained to operate the facilities. Water monitoring infrastructure will comprise several monitoring stations and water meters; the technology suppliers are currently being assessed and will be selected at the start of the project. The data centre will be compatible with similar system already established in Awash basin.

For the project beneficiaries, proven technology will be introduced in combination with technical training by Joytech. The package will consist of hybrid seedlings and drip / sprinkler irrigation. For both, it will be essential that farmers are adequately trained and that continued support is available also after the project completion. It is established by Joytech and Meki Batu that the reason why farmers do not achieve optimal results with improved seedlings and drip irrigation, is the lack of knowledge. Precision agriculture requires exact application of inputs and adherence to the time schedule, on top of appropriate maintenance of the irrigation systems. Farmers tend to revert to their usual practices if not sufficiently supported, hence the project partners intend to demonstrate the good practices, provide ample training and establish a network of support offices.

Furthermore, sustainability of smallholder farming with improved planting material and efficient irrigation will be based on a viable business case. 800 farmers will be supported by the project, so that a sufficiently broad base of improved farms is created in terms of geographic coverage, attracting more farmers to follow. A range of irrigation technologies will be offered, from bucket drip irrigation to more sophisticated systems, so that all categories of farmers are able to make the transfer to more efficient water use.

SOCIAL SUSTAINABILITY
Agriculture is the primary source of income for the majority of the Ziway basin population. Water resources are therefore of great importance for the livelihoods in the area. Water abstraction and its impact, however, are not evenly shared; for instance, upland farmers along the Meki and Katar rivers extract sufficient water for their needs while farmers along the Bulbula river (to the south of the lake Ziway) already experience water shortages, reducing their income-earning capability. It is the intention of the project partners to substantially enhance the understanding of all stakeholders regarding the interdependency of human activity and its impact on the environment. At the same time, the project will aim to improve the situation for the most vulnerable groups by specifically focussing on supporting upland farmers and by increasing water availability in the Bulbula river.

Social sustainability will be achieved through extensive consultations with all stakeholders in the area. Water availability and land rights are sensitive issues, with different actors competing for the limited resource. Hence, it will be crucial to invite all interested parties to take part in the process: different government levels, large agri-businesses, livestock holders, industry representatives, fishermen, tourism sector companies, drinking water supply companies and environmental protection organisations being the most important ones. Although there is a general awareness of the problems of the Ziway basin, the consequences of continuing with status quo and the benefits of the improvements need to be made clear. Wetlands and partners will establish a multi-stakeholder platform to support the process and maintain the actions and impact beyond the project's timeline.

4.2. Gender strategy

RVLBA, as the ultimate implementing authority for the water allocation plan, has defined in its operational strategy that women play a central role in integrated water resources management. There is awareness at the authority that a project is more likely to achieve what its planners envisage, if both women and men are active participants and decision makers. With that realisation in mind, the partners have designed a gender-transformative strategy for this project that is visible in outputs and outcomes

of all work packages, encouraging participation of women as decision makers, beneficiaries and implementing partners.

In the Ziway area, most of the horticultural activities are handled by women. Hence, women will have more opportunity to access improved agricultural practice and other technologies. Previous experience of Meki Batu Union shows that farm plots managed by women are more productive than plots managed by men. Hence, there is a good case for the engagement of women and this project will build up on this experience to ensure gender representation. For the Work package 2 (Business case for small farmers) Meki Batu has specified gender-strengthening measures that are realistically attainable in the current conditions. The overarching ambition when working with small farmers is to support participation of women as head of households and to increase the visibility of women as equal partners in farming household. (At present, most farmer members are men while their spouses are equally involved in farming activities.) Hence, for the pilot project with farmers and beyond, at least 20% of participating farmers will be women. Also, cooperation contracts with farmers members (men) who will participate in the project, will be co-signed by their wife (if married). Training will be implemented in such a way that either both partners can attend or that partners can attend separately. Input from women regarding the technology and the workload will be taken into account when developing the business case for different crops and farming areas.

At RVLBA level, the organisation will aim at least 30% of women on the project team. Furthermore, during the water allocation plan process, attention will be paid to the representation of women. This will be achieved through a) participation of women user groups, b) recommendations to stakeholder as to how to organise the consultations to ensure participation of women and c) encouraging women leadership at different stakeholder groups.

For the work package 5, related to watershed activities, at least 20% of the targeted farmers will be women. Training will be designed to encourage and enable women to attend through choosing appropriate locations and time slots and at least 30% of the trainees will be women.

4.3 Upscaling

With the water allocation plan (WAP) finalised, including endorsement by key stakeholders, RVLBA will have the tools in hand for the implementation of the plan throughout the Ziway-Shalla basin. Furthermore, human resources of RVLBA will be developed to professionally manage different activities from collecting water charges to monitoring of water quantity and quality, and environmental management. Through stakeholder consultations involving farmers, businesses, institutions and broad public, a behavioural change is pursued that is needed for the introduction of water tariffs. The fees that will be collected from water users represent an important step towards self-sufficient functioning of the basin authority. Rules for utilisation of the funds thus collected will be laid down in the WAP. RVLBA intends to introduce water meters at all irrigation users (both smallholders and agrifirms) in the whole of Ziway-Shalla sub-basin following the project completion.

Given the importance of the Ziway basin for people, the economy and the environment, the Ethiopian government is expected to continue providing budgetary support to RVLBA in the long run. Other funders of programmes and projects will be sought to complement the government funds. For example, African Development Bank has already expressed interest to contribute, and although the scope of this commitment is not yet clear, the project consortium will be positioned well to influence other investments and raise additional resources for the scaling of the programme.

On top of the institutional strengthening and behavioural change that this project will accomplish, it will also demonstrate the business case for the largest water users – small and medium scale horticultural farmers. Without their collaboration, it is impossible to curb the water consumption in the Ziway basin, with all the negative consequences thereof. Meki Batu, as the project partner, will play an important role in facilitating investment in improved farming including efficient irrigation techniques. The partners will undertake a range of farmer meetings, involving peer farmers, to bring over the message. So, further upscaling of the improved agriculture will be based on commercial premises, generating multiple benefits for farmers in terms of increased income, improved soil fertility, improved food security and strengthened economic activity. During the project 800 farmers will participate in the pilot while the

basis for further scaling will be laid through conducting demonstrations for another 3,200 farmers. The involvement of large horticulture farmers/agrifirms and other large water users will be assured through an intensive stakeholder process, in which the project will build upon the Stakeholder Coalition as established by IDH.

Finally, the project will create conditions for the restoration of the lakes' natural balance and buffer it for the impacts of climate change. This positive environmental impact will not be noticeable immediately as, for example, it will take years to bring lake Abijatta to its original state. The key is to stop the negative developments as soon as possible, so that further deterioration is halted. When that point is reached, nature will largely take care of its own recovery.

5. Public Private Partnership

5.1. Need for a PPP

The project requires public-private collaboration as it concerns water-related issues that have large impact in both public and private domain. Water resources are a public good and the responsibility for its management is in public hands. Commitment of RVLBA to this project ensures that the project results are embedded in the local structures and can be scaled in the future.

On the other hand, the unsustainable situation in the Ziway basin has developed due to unchecked growth of irrigated agriculture, which has become an important income generator for local farmers and the region in general. Farmers and agricultural companies therefore have large and urgent interest to ensure that water – as one of their key production inputs – remains available. Also, they are aware that water charges will be introduced in the short to medium term, which provides an additional incentive to decrease the use of irrigation water, thereby minimising their future expenditures.

Participation of a broad range of stakeholders is a precondition for the acceptance of the to-be-introduced water tariff system. Public authorities need water users and general public to support this change. At the same time, water users and general public need the authorities to establish a transparent and fair water allocation and sharing mechanism so that the needs of all users are adequately met. In other words, it would be extremely difficult, if not impossible, to implement this project as a stand-alone initiative of either the basin authority or the agricultural sector.

5.2. Composition partnership

Organisation	Role	Type	Country	Year founded	Size (FTE)	Core activity
Stichting Wetlands International	Lead partner	NGO	The Netherlands	1996	150	Advising and implementing projects on conservation and sustainable use of wetlands.
Rift Valley Lakes Basin Authority	Partner	Public	Ethiopia	2011	130	Management of Rift Valley Lakes Basin
World Waternet	Partner	Public	The Netherlands	2007	8 (1800 Waternet)	Advising international partners on water management.
Acacia Water	Partner	Private	The Netherlands	2007	31	Research and advice on safe and clean water.
Meki Batu Cooperative Union	Partner	Private	Ethiopia	2002	30	Marketing, representation, support to members (horticultural cooperatives)
Joytech	Partner	Private	Ethiopia	2004	1,500	Production of herbs, propagation of vegetable seedlings.

Acacia Water has three key shareholders: ACDV Beheer B.V. 37,5%, Jover Beheer B.V. 37,5% and K. Groen Beheer B.V. 25%. Meki Batu is fully owned by its 152 members (farmer cooperatives). Joytech has one private person as majority shareholder (Mr Arnon Carmel).

Other cooperating partners for this project are (Letters of Intent are attached):

IDH has been active in Ethiopia through its sustainable landscape programme in the lake Ziway area since 2015. It has worked on restoration of degraded areas, global good agriculture practices certification for smallholders of Meki Batu, integrated solid waste management and supporting RVLBA in the development of the workplan for the Water Allocation Plan. IDH has a MoU with Wetlands International for collaboration in the Rift Valley and is a member of the Steering Committee of the WAP. In 2017, jointly with RVLBA and Wetlands International, IDH has commissioned a water potential and demand study for the basin, that will be finalized in in 2018, providing transparent and reliable data for the project.

Etiopian Horticultural Producers Exporters Association (EHPEA), a business association of 120 members active in horticultural production, will support the project. Through EHPEA, horticultural companies in the Ziway basin will participate in the stakeholder consultation process. Sustainability in general and sustainable water management in particular, are focus areas of EHPEA's support to its members. Its activities entail capacity building, networking and marketing. Currently EHPEA works with 26 of its members in developing wetland areas on agricultural farms.

Oromia Irrigation Development Authority (OIDA) will participate in the consultations and will support the project, aiming to accelerate irrigation development in the region while utilise limited resources efficiently and sustainably.

Castel Wineries, as one of the larger agricultural companies in the region, has expressed its commitment to participate in the project and the consultations leading to more efficient water use.

Adami-Tullu Agricultural Research Centre has been working in the Ziway region for the last few decades, focusing on generating, adapting and transferring technologies for improvement of agricultural productivity. The main research areas are: horticulture and biotechnology, soil and water conservation, agro-forestry, irrigation, water harvesting, livestock production and agricultural extension & economics. Currently they have ongoing research trials and demonstrations sites in project area with different resource efficient technologies (including drip irrigation) and improved agronomic practices. They will bring local knowledge and practical expertise to this project.

5.3. Interest in project output and outcome

Applicant/Lead Partner: Wetlands International is a unique global organisation dedicated to the conservation and sustainable use of wetlands for both people and biodiversity. Its technical expertise and its exceptional experience in working with stakeholders in a participatory way, places the company as a frontrunner in the area of sustainable wetlands management. From this prospective, Wetlands International has worked in the Ziway basin since 2015, supporting local partners to assess the status, develop and implement solutions for the preservation of the wetlands, focusing initially on the conservation of lake Abijatta. In the process, the organisation has built strong relationships with the local stakeholders, thereby acquiring substantial knowledge of the basin and the various interconnected issues that contribute to the degradation of the Ziway basin. So, for Wetlands International, this project represents an opportunity to connect various public and private stakeholders in a joint effort to preserve the Ziway basin and wetlands ecosystems for its various users.

Partner 1: RVLBA is the Ethiopian governmental agency in charge of the management of the Ziway basin. It has been assigned the task of developing and implementing a Water Allocation Plan (WAP) that will enable regulated and efficient use of water, contributing to long-term sustainable management of this water resource. Hence, RVLBA is interested to partner with Dutch and local expert organisations to develop and implement a comprehensive and viable plan that is supported by the local stakeholders.

Partner 2: World Waternet Foundation is a non-profit organisation with 9 permanent staff, founded in 2007 on the initiative of the Waterschap Amstel, Gooi and Vecht (AGV) and the Municipality of Amsterdam. World Waternet uses the expertise of both organisations (1,800 FTE) to help improve the performance of water organisations in developing countries. It supports local governments and public water companies to improve their performance and strengthen their organisations through knowledge sharing, skills development and strengthening of the institutional settings. The organisation currently provides basic support to three basin authorities in Ethiopia with its own funds, and has a good collaboration with the Basin High Council.

Partner 3: Acacia Water is a Dutch expert company with a strong team of water resources experts. Acacia has been active in Ethiopia, among others, where it has deployed its expertise and skills in the pursuance of clean and safe water for all in the Ziway-Shalla basin. Acacia has a strong interest to utilise its experience and capacities for the benefit of the Ziway basin. This project offers a good opportunity for Acacia to strengthen its expertise and its position as a technical expert in sustainable basin management.

Partner 4: Meki Batu Farmers Union is one of the most active and well-organised farmer associations in the region. It has 152 members (farmer cooperatives), representing 8,360 small farmers who are actively supported with technical and marketing activities. This association is interested to assist the members with the introduction of improved farming practices, including efficient irrigation. Meki Batu recognises the threat of decreased water levels and deterioration of water quality in the Lake Ziway, which will have long-term impact for the agricultural production of its members in the long run, but the organisation also expects that its farmers will directly benefit from this project thanks to the increased income.

Partner 5: Joytech is an innovative Ethiopian agricultural company active in three sub-sectors, namely: a) cultivation and export of fresh herbs; b) cultivation and export of cut roses and summer flowers and c) propagation of vegetable seedlings. Joytech has 1,500 employees, of whom 70% are women. It deploys modern greenhouse and irrigation technology, utilises natural resources to replace chemicals and pesticides wherever possible, and applies Dutch refrigeration techniques in its supply chain. Being aware of the constraints of technical know-how among small scale farmers, Joytech has been organising farmer training programmes in different regions of Ethiopia, introducing the farmers to improved seed and seedlings usage, agronomic practices, fertiliser application, plant protection and irrigation management. Propagation of vegetable plantlets is the latest addition to the company's activities and the one that Joytech is keen to grow in the coming years. As Ziway area is an important horticultural hub of Ethipia, Joytech is interested to develop its customer base in this area.

5.4. Added value of partners

The lead partner Wetlands International has been working with public, private, knowledge and NGO partners on numerous water-related projects globally. The organisation has been involved in Ethiopia since 2015. Wetlands brings in its unique expertise on wetlands ecosystems and landscape management, its project management capacity and stakeholders convening skills. It has strong experience in successfully establishing linkages between wetlands and biodiversity conservation and livelihood improvement while building community resilience against the impacts of climate change. Parallel to working on the ground level to reverse the unsustainable resources utilization regime that led to environmental degradation in Ziway-Shalla sub-basin, Wetlands international will bring in its immense experience- and knowledge-based policy advocacy works. Examples of projects in the area are:

- A Climate Resilient Site Network in the African Eurasian Flyway; a comprehensive wildlife preservation programme aiming to maintain and / or restore wetland areas for migratory birds (of which lake Abijatta is one) on a landscape scale. With this project Wetlands International is also working to integrated wetlands and ecosystem based climate change adaptation/climate change risk reduction in different sectoral policies, strategies, programmes and plans.
- Partners for Resilience programme, that aims to increase the disaster resilience of vulnerable communities.

RVLBA is the key public partner for the project, mandated by the Ethiopian Ministry of Water, irrigation and Electricity to establish and sustainably manage water resources in the Ziway-Shalla basin. On top of its decision-making and implementing capacity, RVLBA brings on board experience and knowledge with regard to lake basin management. The organisation, although still very young, has already achieved substantial results in terms of planning and implementation of basin activities. The most important one, in relation to this project, is the development of the action plan for WAP, which has been accomplished with support of Dutch partners during 2016-2017. The following activities were a part of the process: an initial water balance study, stakeholder identification, validation of the WAP action plan with stakeholders, preparation of Terms of reference for the execution of the water potential and demand study (services currently being procured). This project, which will have a final WAP endorsed by the stakeholders as one of the key outcomes, will build on the preparatory activities already completed by RVLBA.

RVLBA has also undertaken various watershed interventions in the Ziway area. The largest project started in 2016 and was funded by the Ethiopian government. Its aim was to minimize and rehabilitate the effects of land degradation, and improve potential of water resource, ensure optimal use of resources for sustainable development and poverty alleviation through implementation of integrated water resource management. The project has been executed at upstream areas having higher contribution of water flow into Lake Ziway (18 kebele's were selected from eight woredas). Some of the key results achieved are:

- Flood diversion dikes developed (290.59 km), gullies treated (3833.85 hectare), of terraces made (1264.51 km), check dams constructed (3851.2 km), water harvesting structures - farm ponds with geo membrane (38)
- Seedling prepared (5.01689 million seedlings), tree planteds on degraded land (1.76015 million seedlings), nurseries, infrastructure, training for watershed officers.

World Waternet brings on board decades of experience in building up and growing a water management organisation. On top of its involvement in the Ethiopian Rift Valley, Awash and Abbay basins, World Waternet has worked on various other projects, such as:

- In Lebanon: two-year programme, launched in February 2017, aims to improve the provision of drinking water, purifying waste water and increase water availability. Boosting farmers' production by encouraging better, more economical water use is also a part of the activities.
- In Indonesia, World Waternet, with the City of Amsterdam and the Association of Dutch Municipalities, has a long term commitment to the Indonesian district of Jakarta. Euro 270,000 worth of services is provided to Jakarta each year since 2004. Similar cooperation has been established with Paramaribo in Suriname, where World Waternet has worked on improving drinking water supply, sanitation and institutional reinforcement of the local organisation.

Acacia Water has unique water-related technical expertise combined with practical experience in Africa and Asia. The company has implemented various coastal and river basin management projects in collaboration with private and public partners on different levels of government, NGOs and civil society organisations. In 2016-2017 Acacia has worked on a GIZ project for the Ministry of Water and Environment of Uganda whereby Acacia has conducted the water resources assessments and the compilation of the catchment management plans. Also, Acacia supported the stakeholder analysis, the establishment of catchment management committees and was in charge of the scenarios development. In Ethiopia, Acacia has worked with Vitens Evides on a 4-year project in Ethiopia from 2013-2017 developing integrated water resources conservation and allocation approach in Harar Regional State. Specific task of Acacia in this project were:

- regional water resources assessment and long term water allocation scenarios;
- a quick scan of water buffering potential in rural Harar and the design and construction of 3 water buffering pilot schemes (sand dams) with upscaling plan;
- rural water supply baseline survey, water resources assessment and water coverage plan to provide access to water for 25,000 people in rural Harar.

Finally, Acacia was a partner on the ISLA project of IDH in the Rift Valley (lake Ziway area). Acacia has developed a proposal for a number of activities in the Central Rift Valley, including mapping the project area, developing a baseline study and developing a series of scenarios. The data and information were presented in an easy-to-understand and transparent manner to the involved stakeholders and the

potential (public and private) investors. The five most promising joint actions were listed and described, including the location to be implemented, an indication of the impact and a cost estimate for implementation.

Meki Batu is one of the largest and most professional horticultural farmer unions in Ethiopia. With over 8,000 members, divided over 152 cooperatives in two woreda's, Meki Batu brings the majority of irrigation farmers into the project. Meki Batu is a shareholder of the Oromia Cooperative Savings Bank, which is one of the more active farmer loan providers in the country. The Union is deeply rooted in the local community and has good relations with local level government, civil society organisations, university and knowledge centres.

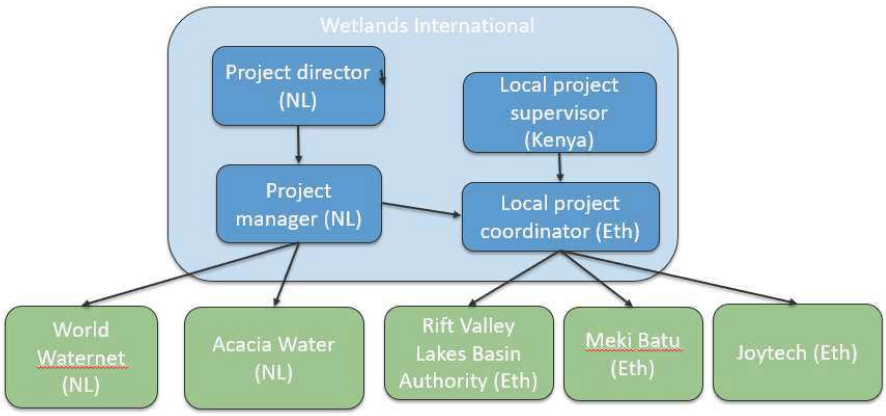
Meki Batu has participated in various government- and donor-funded programmes and projects financed, such as:

- IDH - GlobalGAP certification of farmer members;
- 2Scale – collaboration on developing marketing strategy and marketing facilities;
- SNV – working on system improvement and marketing;
- CYMMIT – collaboration on seed improvement;
- NOC (Ethiopian fuel company) - fuel supply for motor pumps, motorcycle;
- IPD – linking Meki Batu to buyers in Germany.

Joytech is the largest fresh herbs producer and exporter in Ethiopia. It operates a state-of-the-art vegetable seedlings propagation facility close to Debre Zeit, with the capacity of 6 million seedlings per month. Joytech is currently represented in three regions (Gondar, Dire Dawa, Arba Minch) and has the intention to further expand its network to also include Awassa and Ziway area in particular. Along with sales of high quality vegetable seedlings, Joytech provides a broad range of advisory services for farmers including pre-planting and planting, irrigation and fertiliser review, prevention and treatment of pests and diseases, and post-harvest treatment. Joytech has worked with Fair Planet and Rijk Zwaan, and has supplied seedlings for another Dutch-funded (FDOV) project.

5.5. PPP and project governance

The lead partner Wetlands International will be responsible for overall project management. Wetlands will appoint an experienced Project manager Mr Merijn van Leeuwen, who has been working in Ethiopia and the Ziway region for the past three years. He will be supported by technical experts and project administration staff at the head office and supervised by the programme director Ward Hagemeijer. In Ethiopia, Wetlands International will establish a local project office. Mr Amde Mulugata, who has large experience and networks in the water and land management sector, and has been involved in the development of this project from the start, will act as the local project coordinator. He will be supported and supervised by the East Africa programme manager Julie Mulonga. A Field officer and a Monitoring and evaluation officer will be hired on part-time basis. Furthermore, local project office will employ a full-time stakeholder engagement expert, who will be partially attached to RVLBA to support them with the stakeholder consultation process and to build capacity of RVLBA staff to take over stakeholder-related tasks. An organigram summarising the project organisation is shown below.



Wetlands will ensure that the local project coordinator has the mandate and the authority to implement his tasks without delays. This person will have decision-making power for operational issues at local level, and will need an approval from the overall project manager for a pre-defined group of activities and tasks. The limits of the authority of both project managers, including the authority to receive and spend money, will be clearly defined during the inception phase.

At the start of the project, Wetlands will establish a governing structure to ensure smooth project implementation. This will entail:

- Project Steering Committee, responsible for strategic and high-level decisions. The body will meet at least twice a year (in person or via teleconference).
- Project Management Board, responsible for operational project management and coordination of all work packages and partners. Focal points of all project partners will have a seat on the Board, which will meet at least once every two months (in person / via teleconference) to discuss running issues.
- Bi-lateral or multi-party working groups as required for certain activities and at certain stages of the project. Project manager will keep oversight of the progress of such working groups.

Wetlands International will be the recipient of the grant funds and the financial manager of the project. Each partner will also be required to appoint the person responsible for the financial management. At the start of the project and based on the FDW contract, Wetlands International will provide a financial plan for the project, ensure that all partners have approved it and are familiar with the requirements regarding project funds, budget spending and financial administration. An auditor will also be appointed at the start of the project so that financial administration of all partners is aligned with the requirements of the audit. Each partner will be required to provide annual audits, evidencing their time and cash spending, and own contributions to the project, either in-kind or in cash. Funds received from FDW will be distributed between the partners within two weeks after the receipt, as per the FDW-approved schedule.
Ownership of water monitoring equipment, water meters and data centre will be with RVLBA. Investments made for the demonstration activities will remain the ownership Meki Batu and its farmer support structures that will operate at cooperatives level (to be established during the project).

6. Project implementation

6.1. Work package Inception

Output work package inception

Upon completion of this work package, preconditions for successful project implementation will have been realised. These include:

1.1 Partnership Agreement.
1.2 (If needed, bank guarantee or loan agreement obtained).
1.3 The project location(s) have been secured.
1.4 Detailed implementation plans on the project work packages.
1.5 Monitoring and Evaluation plan developed and operational.
1.6 Required permits and licenses are obtained.
1.7 Proof that local law does not require an EIA submitted to RVO.nl.
1.8 First draft sustainability compact.
1.9 Progress report on project inception.
1.10 Baseline report.
1.11 If needed, request for project budget change.

Activities work package inception

The following activities will be implemented during the first project phase. The partners responsible for each activity are mentioned in the right column. For several activities, more (or all) partners will be expected to participate. In this case, the first mentioned partner will take the lead.

Partner meetings	WI, all partners
Preparation of final partnership agreement, including project management structure and responsibilities	WI, all partners
Finalisation of financing arrangements	If required
Establishing project office including rental contract	WI
Concluding contracts for demonstration units	MB/JT
Preparation of detailed implementation plan	WI, all partners
Obtaining permits and licences	RVLBA/MB/JT
Obtaining proof that EIA is not required	WI
Commissioning Monitoring and evaluation services incl. Baseline report	WI
Preparation of Sustainability Compact	WI, all partners
Preparation of inception report	WI, all partners

6.2. Work package 2 Business case for small scale irrigated horticultural farms proven

Outcome work package 2

2.1 800 smallholder farmers, of which at least 20% women, on at least 200 ha, have transferred to improved agricultural practices, decreased water use and increased yield and income; in case a man is the land owner, cooperation contracts are signed by both spouses.
2.2 At least 1,000 additional farmers have expressed interest for improved horticultural farming with efficient water use.

The beneficiaries of this work package are smallholder farmers engaged in irrigated horticulture, located around the lake Ziway and its tributaries. Almost all of these farmers are members of the Meki Batu cooperative union; hence they will be mobilised through the existing cooperative organisation. The outcomes of this work package contribute to the realisation of the project impact, both in relation to the improved water balance in the basin, and in relation to improved position of smallholder farmers in terms of productivity and income. Also they contribute to strengthening the position of women through their formal inclusion in signing the cooperation contracts. The outcomes are directly related to the key issue of unsustainable water use in the Ziway basin, as described in the problem definition. The targeted farmers will be supported to improve their productivity while introducing more efficient irrigation methods (sprinkler, drip).

Output work package 2

2.3 Business case for improved irrigated farming at smallholder level developed and piloted with 800 farmers, including introduction of water meters.
2.4 Improved cultivation practices with efficient irrigation demonstrated to 4,000 farmers.
2.5 Support services for farmer transition to improved farming practices with efficient irrigation established and operational.

To support the transition of farmers to improved horticulture, the project will offer demonstrations close to farmer locations, continued training opportunities and a business model for different crops and farming conditions. The pilot group of farmers will be supported to establish demonstration areas with efficient irrigation and improved planting material, which will be provided by Joytech. Cultivation practices (planting, irrigation, application of fertilisers and agro-chemicals, post-harvest treatment) will be a part of the training programme that Joytech will deliver at pilot plots. Leading farmers will further be supported by Meki Batu field staff to ensure that the transfer is technically and financially sustainable, and that the knowledge is further transferred to other interested farmers. Meki Batu will be the owner of the irrigation infrastructure and equipment, as required for the demonstrations. The union will also remain the owner of the business cases, which will be used to scale the piloted farming model.

Activities WP 2

This work package will be implemented by Meki Batu and Joytech, with advice from Acacia Water regarding irrigation and under supervision of the project lead Wetlands International. Meki Batu will mobilise 150 lead farmers to host a demonstration plot where improved seedlings and efficient irrigation will be introduced. These farmers are GlobalGAP certified, and located at different villages around Lake Ziway, which will ensure simultaneous introduction of the new business model at the whole target area. After the initial group has transferred to new farming practices, it is expected that another 650 farmers, of which at least 20% women, will be attracted to join the programme. These farmers will be trained by Meki Batu field staff. When a contract is signed with a farmer to participate in the programme, it will be required that both spouses jointly sign it, and that both attend training, either together or at separate

sessions. By the last project year, the partners foresee that another 3,200 farmers will have attended demonstration days. As a consequence, over 50% of the Meki batu farmer members will have the opportunity to get acquainted with the improved seedlings and farming practices thanks to this project.

Review of current agricultural practices and business models in targeted farming areas	WI/AW/external
Assessment of larger scale irrigation options for Meki Batu cooperatives	AW/local knowledge partner
Development of business case for 2-4 major horticultural crops based on improved farming practices and efficient irrigation at farm level	WI/external
Establishment and operation of farming demonstration units (150)	JT/MB
Development of training material including business calculations for small farmers	JT/AW
Training of Meki Batu staff on improved agricultural practices with efficient irrigation	MB/AW
Training of farmers on improved agricultural practices and efficient irrigation	JT/MB/AW
Piloting improved practices and efficient irrigation with 800 farmers including signing of cooperation contracts with both spouses	MB/JT
Introduction of water meters at 800 farmers -> link WP3, Output 3.4	RVLBA/MB
Demonstrations and field days for 4,000 farmers	JT/MB
Introduction of farmer support services	MB

6.3. Work package 3 Water Allocation Plan for Ziway-Shalla sub-basin completed and accepted by stakeholders

Outcome work package 3

3.1 Water balance in the basin improved with water abstraction by the agricultural sector decreased with at least 2 mln m3; inflow into Bulbula river increased with at least 10% and into lake Abijatta with at least 5%.
3.2 Conditions created to reserve a part of the collected water revenue for interventions that support wetlands, reduce land degradation and water use in the basin.
3.3 Key stakeholders understand and support water-revenue based basin management model.

The outcomes of this WP will contribute to restoring the water level in the Ziway basin, which is the key result aimed for by this project. Furthermore, this project will ensure that RVLBA continues investing in interventions that will speed up and sustain the recovery of the basin. Ultimately, this outcome will broadly benefit the economy, the livelihoods and the environment of the whole basin, which are currently in jeopardy due to the deterioration of the water resources. Immediate effect is expected for small farmers around Lake Ziway, particularly to the south of the lake (around the Bulbula river).

Output work package 3

The key output of this work package is the Water Allocation Plan (WAP) – the principal document that will define the allocation and sharing of the water resources in the basin for the longer term. To ensure its effective implementation, it is essential that all water users participate in the WAP formulation process and endorse the WAP principles. Hence, stakeholder consultations are an important part of the project and a means to come to a consensus while avoiding conflicts. As a part of the process, stakeholders' understanding of the environmental issues and dependencies will be enhanced. Finally, WAP needs to receive an approval from the high level authorities; hence the relevant ministries and the Basin High Council will be closely involved in the process.

3.3 Water Allocation Plan (WAP) for the Ziway-Shalla basin completed, based on water balance as basic principle; WAP includes maximized water usage volumes per area/type of users, water permits, tariffs, payment modalities and provisions for water security investments.
3.4 WAP pilot-tested with the largest water users (at least 800 horticultural farmers) including the introduction of water meters.
3.5 Stakeholder engagement process completed, WAP endorsed by key stakeholders and approved by authorities.
3.6 Stakeholders are trained on environmental protection and responsible water usage.

Activities work package 3

This work package will build on the WAP activities already completed, namely WAP Action plan, establishment of the WAP Steering Committee and the completion of the key technical studies (water resources, water demand). These activities have been supported by Wetlands and IDH. At the start of the project, Wetlands and Acacia Water will review the studies and undertake additional fact finding, if required, so that WAP is based on scientifically proven data that are trusted by various user groups. In

parallel, stakeholder engagement structures will be established: on top of the Steering Committee that is already in place, a Technical Committee and a Strategic Committee will be established.

World Waternet will support RVLBA with the development of the WAP. The technical part (scenarios development) will be implemented by Acacia Water and local knowledge partners while the tariff study with payment principles and enforcement measures will be done by Waternet, in collaboration with knowledge partners. (As different expertise will be required for different elements of the WAP, different local and international knowledge partners will be hired as per the terms of reference for each task.)

Paralel with the development of the WAP, stakeholder engagement process will commence. A full-time person will be hired to advise and coordinate this activity. Key water user groups (irrigation farmers, agricultural companies) will be particularly supported to participate in the WAP consultations; small irrigation farmers through Meki Batu Union and agricultural companies through EPHEA, which is a supporting partner for the project.

Upon completion of the WAP process, RVLBA will start placing water meters, which needs to be coordinated with the activities under Work package 2. Wetlands International, as the project manager, will ensure timely and adequate coordination between the work packages and the key implementing partners RVLBA and Meki Batu.

Most activities of this work package are the responsibility of RVLBA, however RVLBA will at the same time be building its capacity for WAP development and implementation, and stakeholder management (Work package 4). Hence, Waternet, Wetlands International and Acacia will support RVLBA throughout the implementation of this work package so that no delays occur in the process. The same partners will be involved in Work package 4, so that institutional capacity building and the actual development of the WAP are coordinated between the partners, enabling gradual transfer of responsibility onto RVLBA.

Establishment of WAP Steering Committee	WI/RVLBA
Review and verification of the implemented studies (water resources, water demand, water use efficiency)	AW
Development of scenarios for water allocation including climate change analysis and determining water volumes allocation per area and type of user (domestic, agricultural, livestock, industrial, urban, environmental, recreational)	AW/RVLBA/WI
Water tariff study including permits, payment modalities and enforcement mechanisms	RVLBA/WW/local knowledge partner
Developing a proposition for water permits and tariffs	RVLBA/WW/local knowledge partner
Development of a financing plan for water efficiency and watershed activities	RVLBA/WW/WI
Drafting of a comprehensive WAP	RVLBA/WW
Review and processing of stakeholder, policy and expert comments on WAP and development a final version of WAP, including a plan for WAP updating and feedback	RVLBA/WW/local knowledge partner
Assessment of pilot locations for water metering -> link Activity related to Output 2.3	RVLBA/AW/MB
Introduction of water meters and issuance of permits to horticultural users participating in the demonstrations -> link Activity related to Output 2.3	RVLBA/MB
Monitoring of water metering and support to users	RVLBA/AW/MB
Development of stakeholder engagement strategy and implementation plan	WI/RVLBA
Stakeholder platform communication and meetings	WI
Steering Committee meetings and advice to RVLBA	RVLBA/WI
Technical Committee meetings and validation of WAP	RVLBA/WI
Strategic Committee meetings and convening with public authorities	RVLBA/WI
Support of Steering Committee secretariat to user groups (farmers, private sector)	WI
Endorsement of WAP by stakeholders	RVLBA
Development of promotional and dissemination materials for awareness raising on environmental issues and best management practices	WI
Workshops on environmental protection and responsible water use for stakeholders	WI/AW
Implementation of awareness raising campaign	WI/RVLBA

6.4. Work package 4, Institutional capacity in place at RVLBA for WAP implementation and basin management

Outcome work package 4

4.1 RVLBA has the required capacities and resources for sustainable water basin management including rollout of WAP, data monitoring and stakeholder management.

This work package is key for the sustainability of the project outputs and outcomes, as it builds the institutional capacity of the Ziway basin authority to sustainably manage the natural resources for which it is responsible. Work packages 2 and 3 will ensure that financial basis for sustainable operations is laid, but to develop a professional, knowledgeable and active basin authority, it is necessary to invest

in software, hardware and training of staff. The direct beneficiaries of this work package are RVLBA and its employees but ultimately all water users and the population of the Ziway basin will benefit too.

Output work package 4

4.2 Organisation, procedures and capacity of RVLBA for WAP implementation and management developed, including integral basin management, revenue collection, financial planning and management.
4.3 Stakeholder convening structures in place and capacity of RVLBA for stakeholder management developed.
4.4 WAP data centre established and capacity of RVLBA for data monitoring, reporting and management developed.

Three groups of outputs can be distinguished within this work package, corresponding to the three areas of RVLBA operations that require institutional strengthening:

- Integrated water basin management;
- Stakeholder engagement and management;
- Data monitoring, collection and processing.

Investments done in hardware (water metering, monitoring, data centre) will remain the ownership of RVLBA. Procedures, standards and guidelines will also be developed as the basis for RVLBA operations. Experiences will be shared on all three topics with peer authorities in Ethiopia (Awash, Abay) and abroad (Naivasha, The Netherlands); hence exchange of project outputs that might be of interest for other authorities will be possible.

Activities work package 4

Training gap quick scan	WW
IWRM training programme for RVLBA staff including watershed management and impact of agriculture on water basin	AW
Experience sharing programme (Awash, Kenia-Naivasha)	WW/RVLBA
Training and organisational advice on water permits and tariffs	WW
Training regarding internal quality management procedures	WW/RVLBA
Design and introduction of internal organisation and quality procedures including customer support	WW/RVLBA
Training of RVLBA staff for management of stakeholder processes incl. consensus building and conflict resolution	WI/WW
Defining internal stakeholder convening structure	WW/RVLBA
Establishment of permanent stakeholder convening structures / water user groups	RVLBA
Training of RVLBA staff for climate, hydrology and water quality monitoring, including landscape approach and relation between agricultural land use, water quantity and quality	AW
Training of RVLBA staff for operations of WAP data centre	AW/WW
Developing water quality monitoring plan and protocol (guidelines for data collection, thresholds, analysis and warning)	AW/RVLBA/local knowledge partner
Purchasing and installation of water monitoring infrastructure	RVLBA
Water quality testing and monitoring	RVLBA
Design and establishment of WAP data centre (surface water, ground water, water demand, water quality, stakeholders, conflicts and management)	AW/RVLBA/local knowledge partner

On all three groups of outputs, activities will be twofold:

- Capacity building of staff (training, experience sharing)
- Introduction of standard procedures and guidelines.

On top of that, hardware investment will be done to enable RVLBA to collect, monitor, report and utilise data (water quantity, quality, payments, revenues) for further improvements in lake basin management. World Waternet, Acacia Water and Wetlands will share the responsibility for different elements of the work package, as per the activities overview.

6.5. Work package 5 Key watershed interventions in the Ziway lake catchment implemented

Outcome work package 5

5.1 Erosion in the catchment of the Lake Ziway reduced on 500 ha; sediment in targeted tributaries to Ziway and Abijatta reduced with at least 10%.
5.2 Increased number of watershed interventions undertaken by at least 20 communities.

These outcomes contribute to the solution of the key water quantity and quality problems in the Ziway basin. It also aims to lay the basis for further scaling of watershed improvement activities. So, on the general level, all water users and the population of the Ziway basin benefits from this intervention, while on the concrete level, villages and farmers where the activities will be implemented, will observe improvements in soil quality and farming results.

Output work package 5

5.3 Watershed agricultural systems reviewed; the most effective anti-erosion interventions and target areas identified.
5.4 Interventions in anti-erosion activities for upland farmers and farming communities implemented in collaboration with the communities, involving at least 600 farmers.
5.5 Upland farming communities (incl. woreda extension services) with at least 600 farmers trained on sustainable agricultural practices including erosion mitigation.
5.6 At least 2,000 additional farmers attended awareness workshops in upland communities regarding the consequences of unsustainable practices for the water basin.

Erosion has been identified as a key issue contributing to the sedimentation of the Ziway lake and its tributaries, but its intensity and reach are not properly analysed and documented. So, the project will offer a report on the agricultural practices in different watershed areas, recommending the most urgent anti-erosion interventions to be executed in short to medium term. The targeted 600 farmers, of whom at least 20% women, and woreda extension workers, will be trained to maintain and scale watershed conservation activities. A larger group of watershed communities will be invited to attend training and / or awareness workshops, so that understanding of the mutual dependencies in the basin is improved among various user groups. Hardware such as trees, terraces and results of other works, will remain the property of the community and / or farmer, depending on the intervention.

Activities work package 5

Identification of the best erosion mitigation areas and interventions on sub-basin level	AW
Establishment of cooperation structures with target communities, with attention to women user groups	WI/RVLBA
Development of implementation plan for different interventions	WI/AW
Piloting sustainable agricultural practices and erosion mitigation with 600 farmers	WI/AW
Demonstrations and field days for farmers and woreda extension workers on sustainable agricultural practices and erosion mitigation	WI
Peer to peer farmer visits	WI
Awareness workshops	WI

Depending on the soil type, soil depth, slope, land use, land cover, type/capacity of of farmers, current farming practices, opportunities/status of markets, physical and biological measures should be combined. Micro-location, the governance structures and the ambition and plans of the responsible woreda should also be taken into account. The measures that will be implemented, are:

- Physical measures: gully plugging, checking the dams, side drains along the roads, stabilization of waterways and drains with vegetation and if needed with breaks to slow down the flow.
- Biological measures: regulated use of forests, forest/tree protection, promoting alternative sources of energy (to avoid tree cutting for charcoal), reforestation with (native plant) seedlings in combination with fast growing grasses, agroforestry, reforestation/afforestation of (micro)catchments (native species, controlled grazing.
- On-farm: farmer managed natural regeneration, hillside terracing, soil and/or stone and/or stone-faced bunds, trenches, pits and micro basins, cut-off drains, mulching, grass-strips, eyebrow basins, live fencing (e.g. with sisal, aloe, euphorbia), trees for windbreaks, tied contour ridges, conservation agriculture.

Watershed farmers and (women) user groups will also be represented at stakeholder consultations (work package 3). In total 2,600 watershed farmers will be directly targeted by the project; they will be recipients of (different level and intensity of) training and awareness creation programmes.

6.6. Work package Project requirements and closure

Output project requirements and closure

6.1 Annual progress reports
6.2 Sustainability compact

6.3 All company project partners developed and implemented a CSR policy.
6.4 If applicable, recommendations made in the Environmental Impact assessment have been implemented.
6.5 Final report
6.6 End evaluation report
6.7 Request for final determination of subsidy and subsidy settlement.

Activities project requirements and closure

Organisation of project management and administration	WI/all partners
Project partner meetings organisation and facilitation	WI/all partners
Identification of problems and risks, development and implementation of problem solving proposals and risk mitigation measures, when required	WI/all partners
Preparation of Sustainability Compact	WI/all partners
Preparation of ICSR policies by all partners	WI/all partners
Preparation of annual reports	WI/all partners
Preparation of final report	WI/all partners
Preparation of end evaluation	WI/external evaluator

7. Financial

7.1. Project budget

Total budget for the project is Euro 4,286,575. 67% is budgeted for the primary theme of the project (Improved river basin management) while 33% is reserved for improved water efficiency in agriculture. The division per work package is as follows:

- WP1, Inception: Euro 172,208
- WP2, Business case for farmers: Euro 1,247,961
- WP3, Water allocation plan: Euro 929,814
- WP4, Institutional capacity of RVLBA: Euro 778,857
- WP5, Watershed interventions: Euro 771,676
- WP6, Project requirements and closure: Euro 386,059

Regarding non-project costs: RVLBA will make seven staff available for the project and will provide the necessary office facilities for the implementation of their tasks.

7.2. Financing of the own contribution

Own contribution of the project partners					
Name organisation (project partner)	**Category**	**Co- finance financed in cash**	**Co- finance financed in-kind**	**Contribution**	**% Own contribution of project budget**
FDW	Public Body	€ 2,976,575.00	€ -	€ 2,976,575.00	69.4%
Wetlands International	NGO	€ 100,000.00	€ 270,000.00	€ 370,000.00	8.6%
RVLBA	Public Institute	€ 200,000.00	€ -	€ 200,000.00	4.7%
World Waternet	Public Institute		€ 200,000.00	€ 200,000.00	4.7%
Acacia Water	Company		€ 60,000.00	€ 60,000.00	1.4%
Meki Batu	Company	€ 200,000.00	€ 200,000.00	€ 400,000.00	9.3%
Joytech	Company	€ 40,000.00	€ 40,000.00	€ 80,000.00	1.9%
Total PPP's own contribution		**€ 540,000.00**	**€ 770,000.00**	**€ 1,310,000.00**	**30.6%**
Total Project		**€ 3,516,575.00**	**€ 770,000.00**	**€ 4,286,575.00**	**100.0%**

All partners have sufficient own resources to bring in the required part of the own contribution.

- Lead partner Wetlands International intends to use co-financing from another donor-funded project (German IKI-financed) towards the financing of the watershed interventions on this project WP5). In kind contribution concerns the time of project staff.
- Rift Valley Lakes Basin Authority (RVLBA) has committed Euro 50,000 per annum for the implementation of this project (Letter of Intent is attached). The funding is intended for the external service providers and hardware to be purchased during the project.
- World Waternet has also committed Euro 50,000 per year for this project. This contribution will be in kind (time of staff working on the project).

- Acacia Water will contribute Euro 60,000 in kind (staff time).
- Meki Batu has allocated Euro 400,000 to this project, of which 50% in cash and 50% in kind. The union has sufficient resources to bring in the requested amount in cash.
- Joytech contributes Euro 80,000, out of which half will be in cash and half in kind (including own staff time and seedlings for the demonstration plots).

Based on the financial analysis as per the Key financial table, all partners have sufficient own cashflow and working capital to finance their own contribution. Contributions from RVLBA and World Waternet are secured through budgetary commitments from their financiers. As solvency of Wetlands International is below the required ratio, it should be mentioned that finances of Wetlands International (foundation, the lead partner for this project) are consolidated with Wetlands International Association, whose solvability is 0.28, and which has the working capital of Euro 1.5 million.

8. Project assumptions and risks

8.1. Assumptions

The development goals of the project concern both the lake basin management and the agricultural sector and are defined as:

- To ensure a balanced Ziway-Shalla Basin ecosystem with a sustainable and transparent water usage and distribution system.
- To improve water security and income of agricultural producers, particularly small farmers and women, in the lake Ziway catchment area.

So, the key assumption underpinning the project strategy is that there is a strong and direct link between smallholder farming practices and the water quantity and quality in the Ziway-Shalla basin. This has been confirmed by various studies and reports, but the extent of the water abstraction by the agricultural sector and its contribution to the situation in the basin has remained uncertain. Hence, the project assumes that (aggregated) smallholder irrigation farmers are the largest water user in the area, with the highest efficiency gain attainable, and aims to substantiate this assumption at the start of the project by means of data collection and analysis.

Regarding the agricultural producers, the project assumes that smallholder irrigation farmers are interested in upgrading their farms and capable of transferring to more sophisticated horticultural practices.

Furthermore, the project is based on the following assumptions:

- Ethiopian government (Ministry of Water, Irrigation and Electricity) remains committed to restoring and sustainably managing lake basins in the country based on water revenue model; no substantial changes in the national policy and strategy occur.
- Regional governments are supportive of the integrated lake basin management and support the implementation of the water revenue model by RVLBA; this includes a balanced strategy regarding the development of the horticultural sector that ensures water balance in the basin.
- National and regional governments take into consideration the water balance in the Ziway basin when developing and implementing economic development policy including location permits for large agricultural companies and industry.
- Political situation in the country and Ziway region remains stable.
- No major shocks occur in the horticultural supply chains and market (diseases and pests epidemics, price hikes, change in quality requirements and standards etc.).
- No extreme weather events occur during the project implementation (major droughts).

8.2. Risk assessment and mitigation measures

The following CSR risks are identified on the project:
Disclosure:

- Lack of transparency in the stakeholder engagement process. With many stakeholders involved, it is important to define the level, the modality and the timing of information sharing for different groups of stakeholders. The project will ensure that a full-time professional will be allocated to the task of stakeholder engagement, so that the process is carefully designed and implemented, considering the interests of all parties.

Human Rights:

- Weak representation of women in the stakeholder engagement process. In most cases, water users are represented by man, while women are identified as those who are in charge of water affairs in their households. To bring a positive change in the process of water allocation planning, the project will encourage different stakeholders to assign the representation tasks to women.
- Vulnerable groups are inadequately represented in the stakeholder engagement process. As these groups are in the rule less educated and poorly informed, it will require a dedicated effort to ensure their fair representation. This particularly refers to poor communities in the Ziway watershed (upland farmers).
- Vulnerable groups (women-headed households, very small farmers) are excluded from the farming improvement interventions. Due to their low level of knowledge and resources, this group is less likely to engage in improved farming. Meki Batu and Joytech will strive to include at least very small farmers (with less than 0.25 ha of horticultural farming land) in the pilot.

Employment and Industrial Relations

- Limited opportunities for women to acquire jobs. Positions that will be created for this project are mostly those of field workers and trainers; for these jobs mostly men apply. Partners will explore possibilities to attract more women for these jobs. This would also positively impact the number of female farmers participating in the farmer pilot.

Environment

- This project will contribute to the restoration and conservation of natural resources.

Combating Bribery, Bribe Solicitation and Extortion

- Some of the stakeholder groups extort pressure to be excluded from the water metering system and / or to receive more favourable treatment. RVLBA will, with the support of the project partners, and through transparent communication, ensure that no such pressure delivers results.

Consumer Interests

- Lack of attention for interests of weaker / vulnerable user groups. This will be addressed as described above (human rights section).

Science and Technology

- Proposed farming improvements are not suitable for the target group. Based on the current status of the targeted farmers and the initial calculations, it is not likely that the farmers will not be able to engage in improved farming. When required, additional training will be deployed to ensure that their technical knowledge is brought to the required level.

Competition

- No unfair competition is expected to be triggered by the project.

Taxation

- Poor payment discipline by water users. As water tariffs are new for water users, it can be expected that they will need encouragement to pay the due fees timely. Through the stakeholder process and a simple way of collecting the fees, RVLBA will make the payments easier for farmers to get used to.

Other risks, related to project impact, outcomes and outputs, are listed in the following table.

ID	Risk item	Effect	Internal/ external	Likelihood	Severity	Risk management and mitigation	Owner / responsible partners
	General						
A	Government policy changes and funding for lake basin management is withdrawn.	Activities of RVLBA are discontinued, water abstraction in Ziway basin unchecked.	External	Low	High	RVLBA is informed and actively participates in and influences policy discussions; can timely anticipate changes and prepare for them.	RVLBA
B	Conflicting economic development and environmental sustainability (national / state government) policies.	Improved water balance in the basin is offset by inflow of new water users (agricultural, industrial).	External	Medium	High	Relevant national and state level authorities participate at stakeholder consultations and ensure that economic development policy supports sustainable lake basin management based on water balance.	RVLBA
C	Major political unrest and instability in the region.	Introduction of water tariffs needs to be postponed. Decline in horticultural activity.	External	Low	Medium	Depending on the severity and the duration of the unrest, project activities might be delayed / moved to a different area; additional resources needed for more intensive engagement with stakeholders. At Meki Batu level: other forms of support provided to farmers, developing new markets, introducing other crops.	RVLBA (basin related) MB (smallholder related)
D	Severe / prolonged drought.	Extreme decline of water level in the basin.	External	Low	High	Drinking water supply has the highest priority; project might get delayed / reformulated; water efficiency measures are strongly enforced.	RVLBA
WP	***Outcome***						
2	2.1 & 2.2 Demand for vegetables in Ethiopia decreases substantially.	Decline in horticulture, farming, decrease in water use by the sector.	External	Low	Medium	Developing new markets and farming activities, taking water efficiency measures into account; encouraging GlobalGAP and building on current initiatives (eg.SNV project).	MB
2	2.1 & 2.2 Extreme climate events (e.g. extended drought).	There is no sufficient water for irrigation.	External	Low	High	Introducing new crops and farming activities; speeding up water efficiency measures.	MB

3	3.1 Extreme weather conditions (e.g. extended drought).	Water balance parameters are not correct, WAP based on wrong premises. WAP introduction delayed.	External	Low	Medium	Taking into account the weather conditions while developing WAP model and scenarios. Postponing the introduction of WAP.	AW RVLBA
3	3.2 Water revenue is lower than expected.	Financial resources of RVLBA are insufficient, limited watershed activities.	External / internal	Medium	Medium	Partners invest substantially in stakeholder awareness and engagement, smallholder farmers supported to increase income. External events contributing to lower revenue will be dealt with appropriately as they occur.	RVLBA
3	3.3 Stakeholders insufficiently participate in the WAP stakeholder engagement process.	Insufficient stakeholder commitment to WAP, delay in process, slow introduction of water fees.	External / internal	Medium	Medium	Partners invest substantially in stakeholder awareness and engagement, various media and training modalities used. External events (political, social conflicts, unrest, no income due to drought) will be anticipated and dealt with appropriately.	RVLBA
4	4.1 High turnover of staff at RVLBA / inadequate knowledge transfer within RVLBA.	Lack of knowledge at RVLBA to continue with activities.	Internal	Low	Medium	RVLBA provides adequate salaries, working conditions and promotion opportunities. The staff to participate in training will be selected based on their capacities and education level.	RVLBA
5	5.1 Extreme weather events (e.g. extended drought).	Extreme decline of water level in the basin.	External	Low	Low	Partners will likely implement watershed activities in any circumstances, possibly with some delay or relocation.	WI
5	5.2 Awareness raising campaign inadequate.	Lack of awareness in the basin regarding the necessity of water balance.	Internal	Low	Medium	Lessons learned and experiences of other projects and lake basins will be used to design the awareness campaign. Updating the campaign based on regular evaluation.	WI
WP	***Output***						
1	1.1 Not all partners sign the partnership agreement.	Project implementation delayed / needs to be restructured.	Internal	Low	Medium/ High	Depending on the partner that has not signed the agreement, replacement / other solutions are sought.	WI
1	1.3 No suitable project office locations can be found. No suitable land for demonstration plots is available.	Project implementation delayed / needs to be restructured.	Internal	Low	Low	Alternatives are timely sought.	WI MB

1	1.4 Input for the implementation plan is not timely provided.	Project implementation delayed, project funds not available.	Internal	Low	Low	Project management procedures in place, delays are timely identified and addressed.	WI
1	1.6 Required permits and licences not (timely) obtained.	Project cannot be implemented as planned.	Internal / External	Low	Medium	Partners are aware of the requirement for permits and licences, and are able to control the process. In as far as external factors influence the process, additional expertise / partners will be attracted to support the process and / or alternative solutions will be sought.	RVLBA
1	1.8 Stakeholders fail to actively participate in the process.	Sustainability compact is not ready.	Internal	Low	Low	Sufficient expertise and budget is reserved for the activity.	WI
1	1.9 Input for the inception report is not timely provided.	Project implementation delayed, project funds not available.	Internal	Low	Low	Project management procedures in place, delays are timely identified and addressed.	WI
1	1.10 External factors hamper data collection in the region.	No records available, delays / changes in implementation.	External	Low	Low	External factors will be dealt with as suggested in the overview of general risks.	WI
2	2.3 & 2.4 Lower number of farmers interested to participate in the pilot.	Impact cannot be reached.	Internal / External	Medium	Medium	Proven ways of farmer engagement will be used, clear business model and financial incentives will be provided to farmers. Additional resources will be invested in the process if required.	MB
2	2.3 & 2.4 Market prices for vegetables change significantly.	Business model not correct, farmers are not interested to improve.	External	Low	Medium	Business model is updated, other crops and farming methods introduced.	MB
2	2.3 & 2.4 Costs of agricultural inputs and irrigation technology rise significantly.	Business model not correct, farmers are not interested to improve.	External	Low	Medium	Business model is updated, financing mechanisms sought to support farmers.	MB
2	2.4 Farmers are not interested and / or unable to attend demonstration days.	Scaling of the project is slower.	External / Internal	Low	Low	New locations and / or business models are developed.	MB

2	2.5 High staff turnover at support services / knowledge inadequately transferred to new staff.	Farmers receive insufficient support.	Internal	Low	Medium	Meki Batu and Joytech review the support system and undertake improvements, when required.	MB
3	3.4 Relevant regional and federal level government do not support the WAP.	Delay in WAP and / or changes required in WAP.	External	Low	High	A body dedicated to coordination with regional and federal governments (WAP Strategic Committee). They are included in the WAP process form the start; the process is managed in gradual steps, requiring gradual approvals, there is some flexibility in how the WAP is organised and implemented (timing, scaling, locations). Bottom line is always ensuring the water balance in the basin.	RVLBA
3	3.4 Policy regarding introduction of water tariffs changes.	Revenue model of RVLBA is in jeopardy.	External	Low	Medium/ High	Depending on the kind of changes, RVLBA will revise its revenue earning plan and coordinate with the national and regional governments regarding the financing of the organisation and its basin activities.	RVLBA
3	3.4 Conflicts occur between different groups of water users, stakeholders disagree with results of reports on water use and demand.	No agreement on WAP, worsening of the security situation.	External	Medium	Medium/ High	Results of studies are transparent and clear to all stakeholders. A full-time position is planned to lead stakeholder engagement process; other involved partners will support with additional resources (if needed) to manage the process successfully.	RVLBA
3	3.4 Lack of commitment at stakeholders for WAP and water tariff system.	Insufficient stakeholder commitment to WAP, delay in process, slow introduction of water fees.	External	Low	High	Partners invest substantially in stakeholder awareness and engagement, various media and training modalities used. 1 full-time professional will lead the process and train RVLBA. External events (political, social conflicts, unrest, no income due to drought) will be anticipated and dealt with appropriately.	RVLBA
3	3.5 Work packages 2 and 4 are delayed or not successfully completed.	Delay in introduction of WAP.	Internal /External	Low	Low	Project manager will coordinate all WPs and act when needed to ensure timely completion of results.	WI

3	3.6 & 3.7 Stakeholders are not interested or able to participate in the process.	Insufficient stakeholder commitment to WAP, delay in process, slow introduction of water fees.	External	Low	High	Stakeholder interest is already demonstrated since 2016. Partners invest substantially in stakeholder awareness and engagement, various media and training modalities used. 1 full-time professional will lead the process and train RVLBA. External events (political, social conflicts, unrest, no income due to drought) will be anticipated and dealt with appropriately.	RVLBA
3	3.6 Not all groups of water users are represented.	WAP is perceived as not-fair, increased potential for conflict.	External	Low	Medium/ High	Depending on the type of water user not represented, RVLBA will act to include this party in the process or find a different way to inform the party about WAP. If a less relevant user is not represented, it can be left out of the process.	RVLBA
3	3.6 WAP does not enjoy institutional support of higher government.	Delay in WAP and / or changes required in WAP.	External	Low	High	There is a dedicated body for coordination with regional and federal governments (WAP Strategic Committee). They are included in the WAP process form the start; the process is managed in gradual steps, requiring gradual approvals, there is some flexibility in how the WAP is organised and implemented (timing, scaling, locations). Bottom line is always ensuring the water balance in the basin.	RVLBA
3	3.7 Awareness programme delivery modalities are adequate for the target group.	Slow and limited response of the target group; results not achieved.	Internal	Low	Low	Professional advisors are hired to support with the awareness programme. Updates and improvements based on periodic evaluation.	RVLBA
4	4.2 Proposed internal procedures are unsuitable for Ethiopia.	RVLBA cannot function properly.	Internal	Low	Medium	Project partners will repeatedly check if the proposed procedures are aligned with Ethiopian regulations and culture.	RVLBA
4	4.2 & 4.3 & 4.4 Trainees lack capacity to participate in the training.	WAP, data centre and stakeholder processes are not progressing; results are not sustainable.	Internal	Low	Low	RVLBA will ensure that the staff with adequate qualification and motivation participates in the training. When needed, staff will be added / replaced.	RVLBA

4	4.3 Proposed stakeholder convening structures are inappropriate for the Ziway basin conditions.	Stakeholders do not approve WAP.	Internal	Low	Low	Expert advice will be sought for this and the process will be regularly evaluated and updated.	RVLBA
4	4.4 Technology is inappropriate for Ethiopia.	RVLBA is not using the technology. Farmers do not transfer to improved technology.	Internal	Low	Low	Partners have assessed the technology options and are quite sure that the proposed solutions, both at RVLBA and at farmer level, are appropriate.	RVLBA MB
5	5.3 Data and capacities for the review are lacking.	Baseline data are not correct.	Internal	Low	Low	AW and local partner will execute the review, results will be assessed and doublechecked when required.	AW
5	5.4 Communities are not interested and / or able to participate.	Limited watershed interventions implemented.	External	Low	Low	Appropriate awareness campaign and modality of training delivery, particularly for women. If results are insufficient, the training will be updated and improved.	WI
5	5.5 & 5.6 Training method is inappropriate and / or trainees are not capable to participate in the training.	Limited watershed interventions implemented.	External	Low	Low	Appropriate awareness campaign and modality of training delivery, particularly for women. If results are insufficient, the training will be updated and improved.	Wi
6	6.1 & 6.5 Inputs for progress reports and final report are not timely and adequately delivered by project partners.	Project implementation delayed, project funds not available.	Internal	Low	Low	Project management procedures in place, delays are timely identified and addressed.	WI
6	6.2 Project partners and other stakeholders have come to a common understanding and accept their respective roles and responsibilities.	Sustainability compact is not ready.	Internal	Low	Low	Sufficient expertise and budget is reserved for the activity.	WI
6	6.3 Partners lack the capacity to develop and implement ICSR.	No ICSR developed and implemented.	Internal	Low	Low	If needed, additional capacity to work on ICSR will be acquired.	WI
6	6.6 It is possible to collect data in Ziway region.	No records available for the project, delays in reporting.	External	Low	Low	External factors will be dealt with as suggested in the overview of general risks.	WI

6	6.7 No audit available of project accounts.	Project cannot be completed.	Internal	Low	Low	Project manager will ensure that all partners adhere to basic accounting principles.	Wi
	CSR						
	Disclosure	No consensus between stakeholders	Internal	Medium	Medium	Strong management and support to stakeholder process.	RVLBA
	Human rights	Vulnerable groups do not participate.	External	Medium	Low	Agreement between partners, specific activities directed towards vulnerable groups.	WI
	Employment and industrial relations	Women do not benefit.	Internal	Low	Low	Targets are set for employment of women.	RVLBA, MB
	Combating bribery, bribe solicitation and extortion	No consensus between stakeholders, conflicts arise.	External	Medium	Medium	Strong management and support to stakeholder process; all stakeholder involved.	RVLBA
	Consumer interests	Vulnerable groups do not benefit.	Internal	Low	Low	Agreement between partners, specific activities directed towards vulnerable groups.	WI
	Science and technology	Farmers do not improve their income.	Internal	Low	Low	Additional training and / or adapted technology.	MB
	Taxation	RVLBA revenue lower than expected.	Internal	Medium	Medium	Stakeholder process, water tariffs are affordable, additional farmer awareness.	RVLBA

9. Project monitoring and evaluation

Wetlands will hire an internal project Monitoring and evaluation coordinator in Ethiopia, who will oversee setting up the monitoring and evaluation methodology and data collection system for the project. Collaboration of all partners will be required to complete this task appropriately. As different partners will collect different data, M&E officer will ensure that these data are registered, interpreted and shared between partners and external stakeholders (when appropriate). On top of that, Wetlands will hire an external evaluator for the baseline study and final evaluation. This will be a competent international firm with substantial track record in monitoring and evaluation of similar projects.

The project will monitor all the mandatory indicators:

- Number of jobs created (m/f; vulnerable) – 22 jobs are expected to be created at RVLBA, Meki Batu and Joytech.
- Number of people trained (m/f; vulnerable) – training will be given to irrigation farmers (4,000), upland farmers (2,000), people employed at project partners (22) and stakeholders (estimated 500).
- Infrastructure established by project – water infrastructure, monitoring and data centre.
- (Progress made towards) financial sustainability – establishment of revenue-based operations.
- Business case (revenue/costs) – several business cases will be developed for small farmers.
- (Progress made towards) financial/ institutional sustainability: enabling environment
- (Progress made on) environmental/climate related aspects

Regarding the topic Water efficiency in agriculture (Work package 2), the following mandatory indicators will be monitored:

- Yearly agricultural yield of main crops
- Water productivity crop yield per unit water

Regarding the topic Improved river basin management and safe deltas (Work packages 3,4,5):

- (Created, executed and implemented) plans for ecological and or socio-economical sustainable delta management and river basins
- Total number of people benefitting from IWRM/ safe delta management projects

On top of that, a range of additional indicators will be included in the M&E plan, from farmer productivity and income, scaling of improved practices, to number of water meters installed, quantity of water in the basin, level of sedimentation in the Ziway tributaries and other relevant indicators as detailed in the Annex 6.