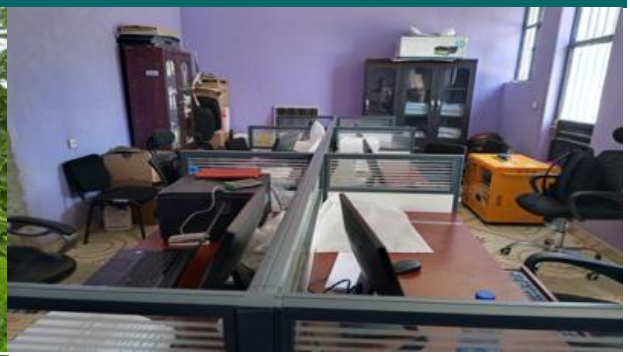
FINAL REPORT

MINISTRY OF AGRICULTURE

FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

RESILIENT LANDSCAPES AND LIVELIHOODS PROJECT (RLLP)

BENEFICIARY/STAKEHOLDERS SURVEY ON SELECTED RESULTS FRAMEWORK INDICATORS OF THE PROJECT

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EXECUTIVE SUMMARY

Background of the RLLP beneficiary survey.

Over the years, Millions of rural Ethiopians have been suffering the problem of Land degradation and had reduced their resilience to climate change. These problems are primarily caused or at least exacerbated by natural and anthropogenic factors. The natural factors include geo-climatic conditions, fragile soil and highly erosive rains, and the anthropogenic factors are mostly related to unsustainable agricultural land management practices (such as slope farming), and clearing of forest lands and vegetation covers driven by the needs for agriculture lands. Tenure insecurity, climate variability and change which in fact some of these are manifestation of this perplex itself. But, the natural resource base remains the foundation for most rural livelihoods and is subject to considerable environmental and climate risks. To address this challenge, the Federal Democratic Republic of Ethiopia (FDRE) introduced a range of reform initiatives including a flagship national Sustainable Land Management Program (SLMP) that includes a number of discreet projects supporting its objectives. In a nut shell, the project was meant to improve the livelihood of rural household and relegate their vulnerability to climate change through supporting livelihood diversification, second level land certification, rehabilitation of degraded land and other forest resources thereby slackening the strain on rural land and natural resource base as a binary source of rural livelihood.

Purpose of RLLP beneficiary survey

The RLLP beneficiary survey was intended to identify the households engaging in approved, non-traditional activities (*activities that are expected to reduce households' vulnerability to future shocks associated with extreme weather events and climate change by diversifying livelihood activities and increasing the resilience of natural (i.e. land) resources),* the extent to which project is meeting stakeholder demand, and land users adopting sustainable land management practices in the project areas. The survey outcomes are to help develop recommendations for any necessary changes in the project as well as generating recommendations and lessons learned for the project's future implementation.

Objectives of the Assignment

The main objective of the survey was to collect and analyze the data/information required for selected project results framework indicators (as part of mid-term assessment report) that are indicated in the Project Appraisal Document (PAD) and in the terms of reference (TORs).

Scope of the beneficiary survey.

The assignment focused on the selected project result framework indicators in the target watersheds. It assessed the actual results of the indicators and determined their contribution to the attainment of the project's objectives. The survey extracted lessons learned, diagnosed and analyzed issues and formulated a concrete and viable set of recommendations for improved project implementation. The assessment also determined the outcomes of the project in relation to the specified project objectives.

Approach and methodology.

The beneficiary survey employed a mixed methods approach involving both quantitative and qualitative techniques to generate findings. The survey was conducted in the six regions of Amhara, Benshangul, Gumuz, Gambela, Oromia, Sidama and SNNPR where RLLP is being implemented. A total of 3794 households

(both male and female headed) were sampled to participated in the survey household questionnaire. Data was collected using electronic questionnaires transcribed on Kobo Collect and deployed on electronic tablets. Other methods that were employed include: consultative meetings; key informant interviews; focus group discussions, document review and photography. Quantitative data was analyzed using STATA, SPSS, Excel and XLSTAT. Qualitative data was analyzed thematically using content and discourse analysis.

Findings of the survey.

Summary of the study findings on selected PDO indicators

Note that the PDO is to Improve climate resilience, land productivity and carbon storage, and increase access to diversified livelihood activities in selected rural watersheds. Building resilience was assessed basing on three capacities of Absorptive, adaptive and transformative capacities. The assessment of absorptive capacity focused on two major aspects (Adoption of Climate smart agriculture and the adoption of sustainable land management practices); Adaptive capacity was assessed basing on adoption of diversified livelihood activities; transformative capacity was assessed basing on adoption of the different kinds of technologies, approaches and practices such SWC, ISFM, Farm water & moisture management practices, environmentally friendly forage development practices, crop diversity practices and water harvesting structures. The findings of the survey indicate that absorptive capacity is 80.5%, Adaptive capacity is at 72.3%; while transformative capacity is at 58.4%.

Adoption of technologies & nontraditional livelihood activities.

Community user groups adopting SWC.

A total of **739 groups** have been established and adopted the different soils and water conservation technologies on communal lands in the six regions that were visited during the survey.

The two major reasons for low level of adoption of SWCs by groups on communal lands are: The desire and willingness of farmers to operate as individual households and the land laws in each of the regions-some of which prohibit settlers from owning and using more than 0.8 hectares of land.

Households adopting SWC technologies

131267 households have already adopted Soil and water conservation technologies as at Mid-term of the RLLP. Out of 131267 households **25946** are female headed households. This represents 88% of the targeted female headed households targeted at the end of the project.

Contribution of forest development covers

The adoption of forest development covers resulted in a number of positive impacts to the beneficiaries and the community. These include but not limited to: diversification of livelihood sources through bamboo selling; reduced erosion; contributed to organic manure through shading & decomposing of leaves; contributed to increased vegetative cover; Increased the amount of rainfall through evapotranspiration.

Contribution of water harvesting structures

Improved crop productivity, reduced floods, reduced soil erosion, improved the quality (color) of water in the different water bodies, increased food security, increased volume of sales for crop produce, increased incomes, improved & diversified livelihood.

Adoption of farm water and moisture management technologies

A number of farm water and soil moisture management technologies were adopted in all the six regions. The different kinds of Terraces however stood out and were adopted in all the regions where the project was implemented. This was followed by soil covers and cover cropping, road water harvesting, hand dug wells and making of points

Adoption of ISFM technologies

Various soil fertility management practices have been promoted by RLLP. These include improved compost making including bio-slurry, vermi-compost and manure management (including bio-digesters); lime and gypsum application for acidic and alkaline soils respectively; promotion of tree-crop-livestock systems (Agro-forestry practices); and crop rotation and legume intercropping. Improved compost making, Vermi-composting and organic manure management are commonly adopted in all the six regions that participated in the study. Within the regions, organic manure management and improved compost making are the most commonly adopted IFM technologies.

Environmentally friendly forage development practices

The adoption of environmentally friendly forage development practices is higher in regions where livestock production is highly practiced. These include SNNPR, Benshangul Gumuz, Gambela and some parts of Amhara and Oromia. The most common environmentally friendly forage development practices adopted are: production of high quality; quantity forage along boundaries, construction of gullies &; backyards and the use of livestock feed resources. The project RLLP further promoted appropriate integration of agro-sylvo-animal husbandry practices at homestead level based on the needs of local farmers and the suitability of local conditions. Practicing an integration of multi-purpose food and tree cropping with livestock rearing at the homestead with an aim of improving the fertility and organic matter content (including carbon) of soils, and increase crop yields and household food security

Adoption of crop diversity practices

Within the regions, specific crop diversity practices have different adoption rates. In Amhara, Intercropping takes the lead in adoption, followed by Alley cropping, followed by Planting improved and suitable crops for particular soils and environmental conditions and then Agroforestry. In Benshangul Gumuz, Alley cropping and Agroforestry are highly adopted, In Oromia, Agroforestry and Planting improved and suitable crops for particular soils and environmental conditions takes the lead in adoption; while in SNNPR and Sidama, Intercropping, Agroforestry and planting improved and suitable crops for particular soils and environmental conditions are highly adopted

Adoption of non-traditional income generating activities.

The findings of the study indicated that over 89% of the project beneficiaries have adopted at least one of the non-traditional incomes generating activities. The findings of the survey further reveal that 86.7% of the female headed households have adopted non-traditional income generating activities; while 90.8% of all the targeted male headed households have adopted non-traditional income generating activities. Apiculture is highly adopted in Oromia and Amhara (at 48.8%) and (41.4%) respectively, vegetable growing is highly adopted in SNNPR, Sidama and Gambela.

Note that the rate of adoption of nontraditional income generating activities is high in both male and female headed

households and is high in both direct and indirect beneficiaries

Adoption of on-farm income generating activities

The survey discovered that the adoption of the different **on-farm income** generating activities varies across the regions. Planting of trees for commercial purposes for example is highly adopted in both Oromia and Amhara; Planting of fruits (pineapples, Avocado, yellow banana, oranges, mangoes, lemons) is highly adopted in SNNPR, Planting of root crop (cassava, potatoes, carrots, yams, etc.) is also highly adopted in SNNPR, Planting of improved & drought resistant crop varieties is highly adopted in Oromia, Planting of Tea and coffee is highly adopted in Oromia and SNNPR; while SNNPR & Oromia take a lead in the adoption of Planting Cereals (wheat, rice, maize, oat, barley, rye, millet and sorghum) and oil seeds.

The study further discovered that Planting of fruits (pineapples, Avocado, yellow banana, oranges, mangoes, lemons) and Planting Cereals (wheat, rice, maize, oat, barley, rye, millet and sorghum) and oil seeds are the most commonly adopted on farm income generating activities by the female headed households. While the Planting of improved & drought resistant crop varieties and Planting of trees for commercial purposes are highly adopted by the Male headed households.

Adoption of off farm activities

Bee keeping is highly adopted in Oromia compared to the rest of the regions (44.7%), Poultry (41.1%) and Vermi-composting (52.0%) are highly adopted Amhara. Within the regions, different off farm income generating activities have different adoption rates. In Amhara for example, Sheep and goat fattening and Poultry are the most commonly adopted off-farm income generating activities. In Benshangul Gumuzi, Bee keeping and Sheep and goat fattening are the most commonly adopted off income generating income generating activities. In Gambela, Poultry and Sheep and goat fattening are the most commonly adopted off-farm income generating activities. In Oromia Sheep and goat fattening and Poultry are the most commonly adopted off-farm income generating income activities, just like it is within Sidama.

Within the female headed households, the most commonly adopted off-farm income generating activities are Bee keeping, Sheep and goat fattening, Poultry. The least adopted off-farm income generating activities are Fishery, Sericulture and Vermin-composting. Among the male headed households, the most commonly adopted are Sheep and goat fattening, Bee keeping and Poultry. The average household adoption rate of off-farm income generating activities is 33.3% for both Male headed and female headed households

Adoption of non-farm activities.

Non-farm income generating activities are highly adopted in Amhara region followed by Oromia, followed by SNNPR and the other regions follows. The findings of the survey indicate that Bamboo processing is commonly adopted in Benshangul Gumuzi and SNNPR. Cook Stove production and marketing is commonly adopted in Gambela and Amhara; Charcoal and Brewery are commonly adopted in SNNPR

Number of times including the years or months of practicing nontraditional income generating activities

Different income generating activities have different gestation periods and therefore have different number of times of being practiced, some are perennial and thus can be practiced once for a number of years, some are annual and can be practiced once

a year, others can be harvested after six months and can be practiced twice a year, while others can be harvested after three months and can be practiced 4 times a year.

Groups of landless youth organized and issued with second level land certificate

A total of 2253 youth groups are the ones who received second level certificate to use communal land. The main reason for the unpopularity of issuing second level land certificate for the youth to use communal land is the desire by the youths and rural farmers to operate as individuals another than groups. They claim that the benefits of farming are more when a farmer operates as an individual as opposed to when they operate in groups where some members are not even fully committed to the group.

Households adopting diversified livelihood activities supported by the project.

A total of **1155,280** households have already adopted and practiced diversified livelihood activities such as apiculture, poultry rearing, sheep and goat fattening, vegetable and fruit farming, and the production and marketing of improved cook stoves which help reduce pressure on watersheds' natural resources. Out of the 155,280 households, 25606 are female households

Sustainability of strategies of IGAs for improving the livelihoods of the beneficiaries

The survey strongly recommends the introduction of the following strategies to the project beneficiaries through organizing seminars, trainings and awareness programs. These programs should focus on the identification of technological, social and organizational types, each able to support different sustainable strategy and the following aspects should be emphasized: The maximization of material and energy efficiency; Business models that create value from waste can reduce pollution and reduce costs in the production process; wastes are often seen as undesirable; Substitute with renewables and natural processes, Functionality rather than ownership, Adopt a stewardship role, Encouraging sufficiency, Repurposing for society or the environment and the development of scale up solutions

Beneficiary satisfaction

Composite beneficiary satisfaction index (CBSI).

The composite beneficiary satisfaction index (CBSI) is the percentage of all the positive responses received during the survey.

$$CBSI = \frac{3387}{3794} X100 = 89.3\%$$

Satisfaction by SLMP phases

$$CBSI_{SLMP-I} = \frac{1341}{1538} X100\% = 87.19\%$$

$$CBSI_{SLMP-II} = \frac{1707}{1858} * 100\% = 91.87\%$$

$$CBSI_{RLLP} = \frac{339}{398} * 100\% = 85.18\%$$

Satisfaction by AEZs

$$CBSI_{Dega} = \frac{1464}{1615} * 100\% = 90.6\%$$

$$CBSI_{Upper\ Kolla} = \frac{207}{294} * 100\% = 70.4\%$$

$$CBSI_{Woyna\ Dega} = \frac{1716}{1885} * 100\% = 91.1\%$$

Satisfaction by region

$$CBSI_{Amhara} = \frac{912}{1067} * 100\% = 87\%$$

$$CBSI_{Benishangul} = \frac{179}{284} * 100\% = 61.4\%$$

$$CBSI_{Gambella} = \frac{85}{101} * 100\% = 84.1\%$$

$$CBSI_{Oromia} = \frac{976}{1052} * 100\% = 92.8\%$$

$$CBSI_{Sidama} = \frac{256}{272} * 100\% = 94.1\%$$

$$CBSI_{SNPPR} = \frac{979}{1020} * 100\% = 96\%$$

Rating the quality of the services

The rating was based on the five SERVQUAL attributes (tangibility, reliability, responsiveness, assurance, empathy) and all major project component activities are more tangible than other service quality attributes. The likelihood that a tangible project component to be reliable is high as it would be responsive as well. In other lyrics, tangibility, reliability and responsiveness are the common service quality attributes that characterizes all project supported activities. Usually assurance and empathy are the service qualities less often attributed to the project activities carried out so far.

Share of target women beneficiaries with rating 'Satisfied' or above on project interventions

$$CBSI_{women} = \frac{1264}{1431} X100\% = 88.4\%$$

Sources of beneficiary household's complaints/dissatisfaction in regard to project intervention

The major challenge and source of dissatisfaction was to mobilize people in SWC practices as the numbers of households residing in some of the watershed are too few to address all farm and communal lands. Equally important source of dissatisfaction was the budget scarcity which forced to carry out the physical SWC activities for free in some watersheds and it was also a source of complain and grievances and forced some of the micro watersheds to be graduated earlier than they should be. The number of nursery sites was also not adequate to exercise agroforestry in farmlands and was mentioned as a challenge during the implementation. More importantly, mulching material was also a challenge to fully practice conservation agriculture

Sustainable land management practices

land users adopting sustainable land management practices.

The total number of land users adopting sustainable land management practices is 403871 as at mid-term. This represents 97.3% achievement of the targeted beneficiaries and confidently confirm that at the end of the project, the indicator achievement will be over 100%.

Women land users adopting sustainable land management practices.

A total of **180,817** females (Women) are currently adopting sustainable land management practices supported the RLLP project. This represents over 87% achievement of the project targeted female land users to be reached at the end of the project.

Female headed households adopting sustainable land management practices

A total of **32690** female headed households are currently adopting sustainable land management practices supported by RLLP project. This represents over 87% achievement of the project targeted female headed households to be reached as of 7th July 2021. The study further discovered that Agronomic practices (mulching, crop rotation, intercropping etc.) are the most commonly sustainable land management practices adopted in female headed households, followed by Vegetative practice (planting of perennial trees, shrubs, grasses), Land structural measures (Physical construction, Terraces) and Land management measures (Agroforestry).

Land users with developed transformative capacity.

Transformative capacity refers to the ability to create a fundamentally new system so as to avoid negative impacts from hazards. This was determined by assessing the number of beneficiaries who have adopted and practiced the different kinds of technologies such SWC, ISFM, farm water and moisture harvesting, environmentally friendly forage development practices, crop diversity among others. The findings of the survey show that **58% of all the targeted** land users that are expected to adopt and develop transformative capacity at the end of the project.

The findings of the survey revealed that the transformative capacity is higher in Male headed households compared to the female headed households as evidenced in the rate of adoption of the different kinds of technologies such as SWC technologies (Terraces & moisture harvesting structures) is followed by farm water &; soil management practices (Terraces, soil cover, road water harvesting, hand dug wells, digging of ponds and then followed by integrated soil fertility management technologies.

Participated in change of the use of a technology promoted or introduced by the project.

A total of **238487 land users** participated in the change of the use of technology introduced and promoted by RLLP. This represents 51.8% achievement of the indicator. This implies that the project has higher chances of attaining 100% of the targeted land users to participate in the change of the technology. The participation in the change of technologies was embraced by the both male and female headed households; and both direct and indirect beneficiaries

land users with access to and adoption of climate-adapted agricultural practices

The survey discovered that a total **106881 land users** have access to and adopted climate smart agriculture. This represents 23% of the targeted land users to be supported at the end of project and are expected to improve resilience to climate change shocks

The extent to which the project beneficiaries are involved in the adoption and integration of the project approved technologies into their regular livelihoods;

To a greater extent, the project beneficiaries are involved in the adoption and integration of the project approved technologies into their regular livelihoods. This is justified by the average adoption rate of the approved technologies of 60.22%, determined by calculating the average rate of adoption of the different kinds of technologies such as SWC technologies, Farm water & soil moisture management technologies, climate smart agriculture, integrated soil fertility management technologies and environmentally friendly forage development practices.

Determinants of the adoption and integration of technologies in the context of Ethiopia.

The study examined factors influencing the adoption and integration of technologies in the Ethiopian context. The findings of the study indicate that a number of factors have hindered the adoption of land management, soil and water conservation technologies. These include but not limited to: The nature of land tenure system; Unwillingness of the youths to engage in Agriculture, Rural urban migration, Limited skills to undertake to adopt the new technologies.

The effective utilization of Woreda information centers by beneficiaries.

Targeted users of the WICs

The assessment discovered that the WICs are being used by the expected beneficiaries. These include the Woreda and below Woreda level SLMP experts. The targeted users are subcategorized into: the **primarily target** and **the Secondary target users.** The primary targets include Woreda level Natural resource management experts and SLMP Staff; kebele level experts; and the secondary targets include: members of the TVET institutions, other researchers, and regional partners and other partner offices

WICs user's opinion and satisfaction levels

WIC users were asked whether they think the WIC are fully functional or not. and 90.24% of the target users reported that the WICs are fully functional. All the users who participated in the assessment had visited and used the WICs; 90% of the users were satisfied with the services being offered at the WICs; and out of the 90% who were satisfied, 52% of were found to be extremely satisfied; while the 48% of the target users are moderately satisfied.

Mechanisms of tracking satisfaction feedback from the WIC users.

All Woreda information centers have two big black books. One is used as a registry for the access and utilization of the Woreda information centers and the other is used capture feedback on the quality of services offered at the WIC. The survey team crosschecked all the books and can confidently confirm that the users are always writing feedback on the quality of services offered as well as making suggestions on what should be improved. This is a clear indication of the effective utilization of the Woreda information center.

Challenges facing the functionality & service delivery of the WIC.

The four major challenges affecting the effective utilization of the WIC are inadequate human resources, limited band width of the internet, electricity instability and limited spaces for some of the Woreda information centers.

Possible recommendations to improve service delivery for the WICs

The assessment recommends hiring an extra person to support the operation of the WICs especially in times when the focal person is required in the field to support the implementation of the field SLMP/RLLP field work activities

The assessment recommends to supply additional Wi-Fi routers to increase the speed of the internet and also be able to accommodate the so many users who tend to seek for the services of the Woreda information centers.

In the next phase of the RLLP project execution, the funders and the coordination unit should think about establishing WIC buildings that are beyond just a minimum of 4 by 5 meters to be able to accommodate the ever-increasing users of the Woreda information centers.

There is need to support the regular use of generators especially in woredas which do not have electricity. This will help to ensure that the users of the centers can access services without regularly without any hindrance.

Establishing whether the WICs meet the building standards as per the Woredas information center guideline.

The findings of the study show that all the watersheds that were assessed and belong in SLMP-II meet the building standards as per the Woredas information center guideline.

Assessing whether the WICs are fully equipped with the necessary facilities.

The findings of the assessment showed that most of the WICs are fully equipped with necessary facilities; Woreda information in areas with no electricity poles use a standby generator to ensure effective service delivery, while WICs with no large screen use the LCD projectors for the same purpose.

Assessing the existence of variety of resources

The findings of the study indicated that all the WIC that were assessed had all the expected resources which are regularly updated in accordance with WIC guidelines

Assessing whether WICs have recording mechanism to capture visitors name and their interest.

All the Woreda information centers that we visited have two books; one is used to capture the attendance of the users (visitors name and their interest) and other is used to capture feedback on the quality of the services of delivered. These two books are a clear evidence of the effective utilization of the Woreda information centers.

Climate change awareness

Awareness of elements of weather (Regional analysis)

The level of awareness of the different elements of weather is generally low especially in Amhara, Benshangul Gumuzi and Gambela. The rate of awareness is relatively high in SNNPR, Sidama and Oromia. Within the regions, Temperature and rainfall are the most commonly known elements of weather.

Human activities that may lead to climate change

A number of activities were reported by the different household heads as activities that may lead to climate change. In both male and female headed households, Deforestation, Overgrazing, and Bush burning were highly reported as human activities that may lead to climate change.

Households involvement in activities that may lead to climate change.

For both male and female headed household, the rate of participation in activities that may result in climate change was over 80%.

Willing to stop practices that may lead to climate change.

Despite the high rate of participating in activities that may lead to climate change; the willingness to change and drop such activities is equally high in both male and female headed households, provided there are better alternative sources of livelihood. Therefore, suitable interventions to curb climate change should be properly designed and implemented in phase two of RLLP to curb climate change

Assessment of whether the expectations of the beneficiaries are met or not.

The findings of the study indicated that 88.8% of female headed households had all their expectations met; while 63.4% of the male headed households had all their expectations met.

Gender inclusion and empowerment

Women were given considerable courtesy during the project planning through its implementation. In most of the project activities where women were highly integrated in, they made equal if not higher participation during the ultimate execution. Moreover, women's decision-making power in the household on those activities that define the household's living standard is now getting improved. As a result, their role in land use decisions, crop production and marketing activities was substantial. We have got good testimonies from women themselves that they are now extensively participating on those cash generating activities which previously were left for women. Finally, the influence of the husband

on the wife is now getting obsolete which most men in rural Ethiopia are usually accused of.

Lessons learnt.

The implementation of RLLP resulted in a number of lessons learnt; which include but not limited to: The need for long-term commitment to maintain the quality of natural resources; the need for integrating the four common principles in implementing projects related to RLLP; the quality and accuracy of data management that comes with the Knowledge management information system (Excel + KMIS based).

Sustainability

A number of mechanisms have been put in place to ensure sustainability of the project interventions; these include: Collective efforts and participation of all the stakeholders; The integration of economic and environmental interests in a comprehensive manner; The emphasis of sustainable land management; The encouraging intensive farming, sharing of experiences and inclusiveness; and the establishment of fully functional & equipped Woreda information centers

Challenges

The challenges affecting the adoption of non-traditional income generating activities and technologies

Gender of the household head and its influence on adoption; Low profitability and efficiency of fertilizer use due to the lack of complimentary improved practices and seed, and lack of irrigation and water constraints and long distance to markets for the diversified livelihood activities

Challenges facing the adoption of sustainable land management practices.

Lack of community agreement to establish and maintain sustainable land management practices; Low rate of adoption of improved breeds of cattle; Lack of the commitment to enforce community bylaws, rules and regulations

Challenges affecting the overall implementation of the RLLP project

Long distance between and within the different watersheds where the project is implemented; The need for money by the community members to support the project interventions and limited number of project personnel and staff.

Conclusion:

The findings of the study can confidently confirm that the RLLP project has so far achieved tremendous results all the indicators scores are very high with the least score being 58.4% and the highest score being over 80.5% as described in the different sections of the report showing the performance of the on the selected indicators

Recommendations

a) Hiring of the extra staff and highly motivating staffs who are handling more than one region.

The assessment recommends hiring of extra support staff to support the implementation of the project activities especially in the new regions. If additional experts are not hired, then the remuneration of experts handling more than one region **should be doubled** to be motivated and effectively undertake the project activities

b) Increase awareness and sensitization.

Increase in awareness and sensitization activities especially in regions where community members need money to embrace the project interventions. All regional governments should take it upon themselves to educate their masses about the benefits of adopting sustainable land management practices as well as adopting livelihood diversification. This will increase the benefits of the project and contribute to the overall Project development objectives at the end of the project.

c) **Increase the capacity of producing and supplying improved breeds of cattle and seeds as well as tree seedlings**

This is to note that despite the fact that regions have the breeding places and centers, the capacity to continuously supply the improved seeds and breeds of cattle is still lacking. In an effort to increase the adoption of sustainable land management practices; the supply of livelihood activities that suit the different sustainable land management practices should be increased otherwise the adoption rate will remain low.

d) **Encourage equitable distribution and ownership of resources**

As indicated among the challenges, one of the limitations to adopting nontraditional income generating activities is shortage of land and other resources; the assessment strongly recommends that all stakeholders should be allowed to own productive resources to be able to increase the rate of adoption of nontraditional livelihood activities

Definition of key concepts

SLMP: Sustainable land management program

RLLP: A combination of phases and categorization of watersheds in which the project activities and interventions have been implemented (SLMP-1 + SLMP-2 + New RLLP = RLLP)

Technology adoption: adoption of approaches to increase land quality and restore degraded lands for example, agronomic, vegetative, structural, and management measures that, applied as a combination, increase the connectivity between protected areas, forest land, rangeland, and agriculture land.

Diversified livelihood adoption: Participating and practicing of practices Apiculture, Poultry, Sheep & goat fattening, Vegetable growing, Fruit farming, Cash crop growing, improved cook stoves production, improved cook stoves marketing; majorly grouped into on-farm, off-farm and non-farm income generating activities

Raw N%: Rate of adoption of diversified livelihood activities across regions, phases, AEZs, male headed and female headed households, direct and indirect beneficiaries.

CoI %: Rate of adoption of diversified livelihood activities within the region, phases, AEZs, Male headed and female headed households and direct and indirect beneficiaries

Building resilience is a central consideration under RLLP, and in general, “resilience” refers to a heightened system capacity to anticipate, respond to, and recover from hazards. Resilience-building involves strengthening three specific capacities

Absorptive capacity: The ability of people, assets, and systems to prepare for, mitigate, or prevent negative impacts of hazards so as to preserve and restore essential basic structures and functions, for example through protection, robustness, preparedness, and/or recovery.

Adaptive capacity: The ability of people, assets, and systems to adjust, modify or change characteristics and actions to moderate potential future impacts from hazards so as to continue to function without major qualitative changes, for example through diversity, redundancy, integration, connectedness, and/or flexibility.

Transformative capacity: The ability to create a fundamentally new system so as to avoid negative impacts from hazards.

ABBREVIATIONS AND ACRONYMS

AEZs	Agroecological zones
BoA	Bureau of Agriculture
CA	Conservation Agriculture
CBSI	Composite beneficiary satisfaction index
CCA	Climate Change Adaption
CSA	Climate Smart Agriculture
CCSS.MATH	Common core state standards for mathematics
CWT	Community Watershed Team
CPF	Country Partnership Framework
EU	European Union
FDRE	Federal Democratic Republic of Ethiopia
FGD	Focus group discussion
FY	Financial year
GTP	Growth and Transformation Plan
HH	Household
IDA	International Development Association
KII	Key informant interviews
M&E	Monitoring and Evaluation
MoA	Ministry of Agriculture
MWS	Micro-Watershed
NPCU	National project coordination Unit
PAD	Project Appraisal Document
PDO	Project Development Objective
PCU	Program Coordination Unit
PIM	Project Implementation Manual
RLLP	Resilient Landscapes and Livelihoods Project
SHG	Self Help Groups
SLLC	Second Level Landholding Certification
SLWM	Sustainable Land and Water Management
SLMP	Sustainable Land Management Program
SLMP-I	Sustainable Land Management Project Phase 1 (World Bank supported)
SLMP-II	Sustainable Land Management Project Phase 2 (World Bank supported)
SNNPRS	Southern Nations Nationalities and Peoples Regional State
SWC	Soil and Water Conservation
TOR	Terms of Reference
WB	World Bank
WIC	Woreda information centers
WOAs	Woreda Offices of Agriculture

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1. INTRODUCTION

1.1 Brief country context.

Ethiopia has faced severe land degradation. The causes are both natural and anthropogenic. The natural factors include geo-climatic conditions, fragile soil and highly erosive rains, and the anthropogenic factors are mostly related to unsustainable agricultural land management practices (such as slope farming), and clearing of forest lands and vegetation covers driven by the needs for agriculture lands. Tenure insecurity, climate variability and change have further exacerbated land degradation. The natural resource base remains the foundation for most livelihoods and is subject to considerable environmental and climate risks. To address this challenge, the Federal Democratic Republic of Ethiopia (FDRE) introduced a range of reform initiatives including a flagship national Sustainable Land Management Program (SLMP) that includes a number of discreet projects supporting its objectives. The SLMP is being financed by the World Bank (WB) and several development partners (KfW, EU, Norway and Canadian Government). For the successful implementation of the Program, the Ministry of Agriculture (MoA) designed the Resilient Livelihoods and Landscapes Project (RLLP) exclusively financed by the World Bank. The WB financing for the third phase SLM Project (RLLP) blends concessional lending from the WB Group's International Development Association (IDA), and grants from Norway and Canadian Governments [1]

1.2 Statement of the problem.

Land degradation affects millions of rural Ethiopians and reduces their resilience to climate change. The causes are both natural and anthropogenic. The natural factors include geo-climatic conditions, fragile soil and highly erosive rains, and the anthropogenic factors are mostly related to unsustainable agricultural land management practices (such as slope farming), and clearing of forest lands and vegetation covers driven by the needs for agriculture lands. Tenure insecurity, climate variability and change have further exacerbated land degradation. The natural resource base remains the foundation for most livelihoods and is subject to considerable environmental and climate risks.

To address this challenge, the Federal Democratic Republic of Ethiopia (FDRE) introduced a range of reform initiatives including a flagship national Sustainable Land Management Program (SLMP) that includes a number of discreet projects supporting its objectives. The World Bank (WB) has provided financing for the SLM Program through the first Sustainable Land Management Project (SLMP-I, 2008-2013) and the subsequent SLMP-II (2014-2018) that together with financing from other Development Partners (DPs) has allowed the SLM Program to support interventions in the major watersheds, out of an estimated 700 that would benefit from SLM interventions. The follow-on WB-financed project, Resilient Landscapes and Livelihoods Project (RLLP), features in the Bank's Country Partnership Framework (CPF) for FY 17-21 as a government flagship program addressing the CPF's resilience pillar, with a funding commitment from IDA-18 of US$100 million credit and USD 32 million in grants from a Multi-Donor Trust Fund (MDTF) financed by the Governments of Norway and Canada.

1.3 Brief background of the RLLP

The targets for natural resource management set out in GTP-II include an additional 19 million hectares to be treated with physical soil and water conservation structures, an increase in national forest coverage from 15 to 20 percent, and the provision of land use certificates to more than 7 million households. To help meet these goals, and to bring the benefits of the Government's SLM

[1] Ethiopia Sustainable Land Management Project -2020 project performance assessment report

Program to further rural communities affected by land degradation, the RLLP will scale up the successes of the SLM Program, and complement these achievements with innovations aimed at sustaining project benefits. The Resilient Landscapes and Livelihoods Project (RLLP) features in the Bank's Country Partnership Framework (CPF) for FY 17-21 as a government flagship program addressing the CPF's resilience pillar, with a funding commitment from IDA-18 of US$100 million. It will leverage and scale up support to the MoALR's SLM Program while also contributing to the climate, forest, water, energy, and land tenure targets in the GTP-II and CRGE Strategy, as well as the forthcoming perspective plan.[2].

1.4 The Project Development Objective (DPO).

The Project Development Objective (DPO) is to improve climate resilience, land productivity and carbon storage, and increase access to diversified livelihood activities in selected 152 rural watersheds in the highlands of Ethiopia. The objective would be achieved through the provision of capital investments, technical assistance and capacity building for small holder farmers in the watersheds and government institutions at national and sub-national levels. The project has four components: (1) Green Infrastructure and Resilient Livelihoods; (2) Investing in Institutions and Information for Resilience; (3) Rural Land Administration and Use; and (4) Project Management and Reporting. RLLP is currently under implementation in 152 "major watersheds" (including the 45 watersheds that were supported by SLMP-I), covering about 2,409 micro-watersheds in seven Regional States: Amhara; Benishangul Gumuz; Gambella; Oromia, Sidama, Southern Nations, Nationalities and Peoples and Tigray

It is important to that the survey consultants were however, not able to visit the **22 major watersheds in Tigray Region** and the **18 GAC Watersheds in Oromia and Amhara** during the data collection as earlier planned during the inception phase. This is because at the time of data collection, the watersheds and woredas were experiencing **tribal conflicts, demonstrations and insecurities**. Therefore, reference for the **findings of the study were based on the 136 watersheds** excluding the watersheds in Tigray and some GAC watersheds in Oromia. The consultant teams agreed with the SLMP/RLLP regional coordinators and M& E experts to replace these watersheds with relatively peaceful and safe watersheds at the time.

1.5 Implementation arrangement of the project

The organizational structure for the implementation of RLLP comprises five levels -Federal, Regional, Zonal, Woreda (District), and Kebele (Sub-District). Overall responsibility for day -to -day coordination and implementation at the federal level is assumed by the MoA through a National Project Coordination Unit in the NRM and Food Security Sector. At the regional level, Bureaus of Agriculture (BoA) lead the implementation of the project. At the Woreda and Kebele levels, on-the-ground implementation is undertaken jointly by Woreda Offices of Agriculture (WOAs) through the Woreda Watershed Technical Committee (WTC), the Kebele Watershed Team (KWT), and the Community Watershed Team (CWT).

1.6 About the Households Beneficiary Survey for RLLP selected indicators

The RLLP beneficiary survey was intended to identify the households engaging in approved, non-traditional activities **(***activities that are expected to reduce households' vulnerability to future shocks associated with extreme weather events and climate change by diversifying livelihood activities and increasing the resilience of natural (i.e. land) resources),* the extent to which project is meeting stakeholder demand, and land users adopting sustainable land management practices in the project areas. The survey outcome will help to develop recommendations for any necessary

[2] Project Appraisal Document for The Ethiopia Resilient Landscapes and Livelihoods Project July 9, 2018

changes in the project. The assessment is expected to lead to recommendations and lessons learned for the project's future implementation.

1.7 Objectives of the Assignment

The main objective of this assignment is to collect and analyze the data/information required for selected project results framework indicators (as part of mid-term assessment report) that are indicated in the Project Appraisal Document (PAD) and in the terms of reference (TORs).

1.8 Scope of the Assignment

The assignment focused on the selected project result framework indicators in the target watersheds. It assessed the actual results of the indicators and determined their contribution to the attainment of the project's objectives. The survey extracted lessons learned, diagnosed and analyzed issues and formulated a concrete and viable set of recommendations for improved project implementation. The assessment also determined the outcomes of the project in relation to the specified project objectives.

1.9 Indicators that were assessed and examined

- PDO-5: Households adopting diversified livelihood activities supported by the project
- PDO-5a: Female-headed households participating in diversified livelihood activities supported by the project
- IR-1: Share of target beneficiaries with rating 'Satisfied' or above on project interventions (aspects: livelihoods, environmental benefits, others)
- IR1-a: Share of target women beneficiaries with rating 'Satisfied' or above on project interventions
- IR-4: Land users adopting sustainable land management practices as a result of the project
- IR-4a: Women land users adopting sustainable land management practices as a result of the project
- IR-4b: Female headed households adopting sustainable land management practices as a result of the project
- IR-8: Woredas Information Centers (WICs) being effectively used by project stakeholders

1.10 Major Tasks that were undertaken by the consultants

1) Assessment of key selected project indicators indicated above and measured changes adaptive and satisfaction achieved in project beneficiary's livelihood;
2) Assessment of the percentage of households engaging in approved, non-traditional activities, relative to the total number of households in the project area.
3) Assessed the extent to which the project beneficiaries involved in the adoption and integration of the project approved technologies into their regular livelihoods;
4) Examined the factors that determine the adoption and integration of technologies in the context of Ethiopia.
5) Assessment of the synergy and harmonization of approved technologies among sub-components of Green Infrastructure and Resilient Livelihoods;
6) Examining the share of land users adopting sustainable land management practices in their farmlands and communal lands as described/defined in the PAD and PIM.
7) Examined the status of Woredas information centers being effectively used by project stakeholders
8) Assessment of the beneficiary's level of participation and engagement in the overall implementation of the Environmental and Social Risk Management activities

2. APPROACH AND METHODOLOGY.

2.1 Approach to the assignment

A mixed-methods approach involving quantitative and qualitative (interactive, participatory and consultative techniques) were used in conducting the beneficiary survey. Participatory techniques such as Key informant interviews, focus group discussions, document review and photography were used during data collection in addition to the household questionnaires and document review. Described in the process flow chart below is a 4-stage approach that was used in undertaking the assignment in light of the assignment objective, anticipated tasks and deliverables.

Figure 1 Phased approach of the beneficiary assessment

2.2 Study area & population from sample was drowned

2.2.1 Project area

The assignment was conducted in the Six Regional States in the highlands of Ethiopia Note that Whereas Watersheds in Tigray and their respective population were part of the sampling design in inception phase, the survey consultants together with the NPCU agreed to drop Tigray and focused on only six regions. These include: Amhara; Benishangul Gumuz, Gambella, Oromia, Sidama, Southern Nations, Nationalities and Peoples. The table illustrates the regions phases, Woredas Major watersheds and both male and female headed households from which the sample was drowned.

Table 1: Targeted project beneficiaries

Intervention Phase	Woreda	Major WS Name	No of MiWS	Area(ha)	House Hold		
					Male	Female	Total
Amhara							
SLMP-I	Alefa	Matizirgi	7	5,475	1,457	179	1,636
SLMP-I	Estie	Chena Gomit	14	10,265	4,711	599	5,310
SLMP-I	Fagita	Guder	14	6,600	4,384	513	4,897
SLMP-I	Machakel	Ketech	14	6,012	2,143	293	2,436
SLMP-I	Gozamin	Dijil	18	15,685	4,969	1,024	5,993
SLMP-I	Gonji Kolela	Yezat	23	11,127	3,542	2,467	6,009
SLMP-I	Yilmana Densa		18	3,691	1,847	369	2,216
SLMP-I	Jabitehinan	Kechem	6	3,436	855	552	1,407
SLMP-I	Degadamot		10	9,493	2,000	514	2,514
SLMP-I	Dembecha		15	8,164	2,057	479	2,536
SLMP-I	Burie Town	Yesir	5	4,511	1,226	254	1,480
SLMP-I	Burie Zuria		13	4,469	2,344	419	2,763
SLMP-I	Guagusa		4	1,472	733	150	883
SLMP-I	Kewot	Robi	13	5,743	2,259	346	2,605
SLMP-I	Shewa Robit		22	12,433	3,093	962	4,055
SLMP-I	Tarmaber		27	13,354	2,885	945	3,830
SLMP-I	Antsokiya	Sal	24	10,150	4,622	1,108	5,730
SLMP-I	17	10	247	132,080	45,127	11,173	56,300
SLMP-II	Bibugn	Arefa	20	10876.55	3823	791	4614
SLMP-II	Enebsie Sar Midir	Dendo	16	9627.09	3855	1308	5163
SLMP-II	Debay Tilat Gin	Muga	18	11625.68	3869	1272	5141

SLMP-II	Baso Liben	Yeda	18	11878.39	3596	603	4199
SLMP-II	Ensaro	Jemma	16	12058.7	5468	739	6207
SLMP-II	Menz Mama Midir	Retmet	19	13893.09	4368	2206	6574
SLMP-II	Artuma Fursi	Indodie	11	5785.88	1087	429	1516
SLMP-II	Dewe Harewa	Dinkiye	17	9063.46	1897	590	2487
SLMP-II	Borena	Kulbit	21	9341.64	3107	1177	4284
SLMP-II	Saynt	Gunda	23	11036.76	3466	779	4245
SLMP-II	Tenta	Gedalas	20	13058.83	4730	1318	6048
SLMP-II	Delanta	Zhita_D	24	13114.97	6259	1432	7691
SLMP-II	Wadla	Zhita_W	18	11730.45	4593	1127	5720
SLMP-II	Gubalafto	Tikur Wuha	18	9712.14	4001	1739	5740
SLMP-II	Meket	Tilkit Deremo	20	12408.41	4666	996	5662
SLMP-II	Sekota Zuria	Diba	10	7919.86	1681	689	2370
SLMP-II	Gazgibla	Bela Amba	16	11840.87	2336	883	3219
SLMP-II	Lay Gaynt	Laygnaw Chefa	23	10987.69	4406	1618	6024
SLMP-II	Tach Gaynt	Gan Wuha	20	9944.23	4646	1548	6194
SLMP-II	Ebnat	Rib Ebnat	21	13358.8	2253	389	2642
SLMP-II	East Belesa	Zana	18	13361.32	2701	728	3429
SLMP-II	West Belesa	Kabtiya	18	8142	4077	711	4788
SLMP-II	Janamora	TilkWonz	15	9328.14	3200	1886	5086
SLMP-II	Chilga	Awuga	19	9598.78	2730	748	3478
SLMP-II	24	24	439	259693.7	86815	25706	112521
RLLP	Enarji Enawga	Chiye	16	8631.11	3240	385	3625
RLLP	Dangla	Awisi	16	10657.09	2208	378	2586
RLLP	Mekdela	Yesga	13	9265.3	2458	1005	3463
RLLP	Lay Armachiho	Mahina	11	7330.68	1737	371	2108
Gambella							
SLMP-I	Gambella	Wandong	3	10,400	683	136	819
SLMP-I	Abobo	Atwo	3	8,107	739	297	1,036
SLMP-I	Godere	Zeiy	6	8,594	3,947	612	4,559
SLMP-I			12	29975	5,369	1045	6,414
SLMP-II	Makoy	Adura	10	6,181	1,922	497	2,419
SLMP-II	Mengeshi	Fejeji	12	20,679	4,914	237	5,151
SLMP-II	Itang	Barger	7	9,571	2,961	1170	4,131
SLMP-II			32	49762	9,797	1904	11,701
RLLP	Dima	Eribo	8	13935	570	489	1,059
			40	25,867	3,782	2313	6,095
			52	93672	18,948	5262	24,210
Oromiya							
SLMP-I	Sebeta Hawas	Dima	7	5,856	1,118	334	1,452
SLMP-I	Kersa Malima	TilikuLemen	15	9,785	4,320	843	5,163
SLMP-I	Woliso	Rebu	15	8,162	2,509	360	2,869
SLMP-I	Omo Nada	Nada	11	7,826	1,851	371	2,222
SLMP-I	Sigmo	Halu	13	14,053	3,644	416	4,060
SLMP-I	BiloNopha	Geba	11	9,416	1,846	144	1,990
SLMP-I	Gimbi	Gefere	15	7,870	3,372	215	3,587
SLMP-I	Gobu Seyo	Meki	13	6,356	1,119	172	1,291
SLMP-I	Gimbichu	Dalocha	12	8,084	1,762	215	1,977
SLMP-I	Uraga	Bangasa	15	10,333	3,762	316	4,078
SLMP-I	Welmera	Wechecha	8	6,558	900	229	1,129
SLMP-I	Tiro Afeta	Nedhi	11	11,616	2,756	416	3,172
SLMP-I	Hidhebu Abote	Aleltu	9	7,308	2,862	347	3,209
SLMP-I	Degem	Lemlem	11	9,358	3,150	504	3,654
SLMP-II	Anasora	Ababa	12	9,417	3,019	229	3,248
SLMP-II	Harmaya	Harmaya	11	8,676	6,744	529	7,273
SLMP-II	Kersa	Water	10	8,023	5,827	507	6,334
SLMP-II	Kuyu	Chirecha	11	9,751	2,601	489	3,090
SLMP-II	WaraJarso	Legadanse	11	8,246	2,167	341	2,508
SLMP-II	AdaaBerga	Bilacha	9	8,063	1,887	254	2,141
SLMP-II	Dendi	Jemjem	10	8,621	2,202	392	2,594
SLMP-II	Ejere	Berga	8	6,850	1,039	237	1,276
SLMP-II	Wonchi	Walga	10	9,590	3,461	316	3,777
SLMP-II	Gumay	Dedesa	7	4,737	2,153	188	2,341
SLMP-II	Mana	Guye	8	4,671	3,201	422	3,623
SLMP-II	Gechi	Koba	10	7,790	1,123	84	1,207
SLMP-II	Metu	Qonor	13	9,921	2,409	482	2,891

SLMP-II	HawaGelan	Chokorsa	9	6,891	2,912	235	3,147
SLMP-II	LaloKile	Birbir	10	6,306	1,729	135	1,864
SLMP-II	Seyo	Meti	11	8,877	4,254	412	4,666
SLMP-II	Begi	Tobi	12	7,973	3,847	528	4,375
SLMP-II	BojiDermeji	Tobbi	12	8,089	1,170	286	1,456
SLMP-II	Kondala	Ganfi	9	6,337	1,355	63	1,418
SLMP-II	JimaArjio	Gimbi	9	5,971	2,208	271	2,479
SLMP-II	Sasiga	Haya	9	6,381	1,713	262	1,975
SLMP-II	SibuSire	Gewiso	11	10,237	2,269	234	2,503
SLMP-II	AbayChomen	Finchaa	11	8,090	1,323	196	1,519
SLMP-II	Amuru	DeroWelege	10	6,812	705	160	865
SLMP-II	Horo	Amerti	12	9,814	1,909	263	2,172
RLLP	Meta Robi	Urga'a	10	12,111	3,384	476	3,860
RLLP	Leka Dulecha	Nagesso	9	12,177	2,438	307	2,745
RLLP	Jardaga Jarte	Chogo	10	14,060	5,678	520	6,198
RLLP	Tiyo	Ilu	14	11,944	3,769	904	4,673
RLLP	Grar Jarso	Girar	10	13,429	4,757	608	5,365
SNNPR							
SLMP-I	MihurAklil	Begeze	15	10,752	8,614	7,276	15,890
SLMP-I	Bulle	Kochore	11	6,096	7,446	1,313	8,759
SLMP-I	Konta Special	Zigna	11	13,817	2,150	426	2,576
SLMP-I	Mareka	Sheta	14	15,372	3,994	2,045	6,039
SLMP-I	Gimbo	Geshi	17	9,090	2,793	267	3,060
SLMP-I	Basketo Special	Ergino	9	11,981	2,150	426	2,576
SLMP-I	Chenna	Chitachuka	19	19,105	6,105	971	7,076
SLMP-I	Alicho weriro	Konekay	15	8,729	2,828	2,943	5,771
SLMP-I	Angacha	Azashuba	10	6,624	8,453	4,404	12,857
SLMP-I	Wensho	Orshageo	11	9,261	4,480	1,919	6,399
Total			129	104836	49,013	21,990	71,003
SLMP-II	adiyo	Adiyo	13	11,535	2,207	273	2,480
SLMP-II	Gesha	Yobano	18	12,418	4,297	5,467	9,764
SLMP-II	Hawassa zuria	Hawassa zuria	16	13,215	23,225	1,573	24,798
SLMP-II	Arbegona	Gelana	16	11,548	7,708	369	8,077
SLMP-II	Geze goffa	Mito	17	9,877	7,786	3,640	11,426
SLMP-II	Oyda	Zenti	12	6,418	4,627	1,157	5,784
SLMP-II	Semen Ari	Mulity	14	8,741	6,127	549	6,676
SLMP-II	Meinitgoldya	Borborolimu	15	7,512	11,722	605	12,327
SLMP-II	Semen Bench	Gacheb	11	11,607	8,147	2,064	10,211
SLMP-II	Tembaro	Lammo	11	6,779	6,330	1,143	7,473
SLMP-II	Soro	Ajacho	13	12,538	7,342	904	8,246
SLMP-II	Gibe	Handosha	16	12,255	8,211	617	8,828
SLMP-II	Loma	Mawula	8	8,411	2,469	514	2,983
SLMP-II	Boloso bombe	Mechancho	14	9,732	10,733	2,910	13,643
SLMP-II	Kindo Didaye	Omo	19	13,013	9,360	490	9,850
SLMP-II	Geta	Haram	8	6,763	5,155	433	5,588
SLMP-II	Gumer	Wabe	12	8,443	6,694	322	7,016
SLMP-II	Masha	Meneshi	18	19,109	2,587	822	3,409
SLMP-II	Mirab azernet	Degosa	13	6,319	8,495	929	9,424
SLMP-II	Hulbareg	DIJO	16	12,639	13,796	493	14,289
SLMP-II	YEM Special	Kora	11	6,883	2,741	261	3,002
Total			289	213813	159,759	25,535	185,294
RLLP	Endegange	Anzachana Zikr	7	9,261	6,856	4,404	11,260
RLLP	Tocha	Dibissa	11	9,770	3,491	352	3,843
RLLP	Genna Bossa	Bachire	8	9,853	4018	1502	5,520
RLLP	South Ari	Maki	7	9,976	9,390	1,047	10,437
Total			31	41236	46,444	11,136	57,580
Total Sum	20	20	200	198891	62181	26861	89042
B.Gumuz							
phase-I	Asossa	Hoha	12	15,511	3,653	2,614	6,267
phase-I	bambasi	Sonka	15	11,624	7,547	1,965	9,512
phase-I	Pawi	Alipapa	10	6,048	1,955	383	2,338
phase-I	kamashi	Jirma	11	8,949	1,612	398	2,010
phase-II	Homosha	Tilikusherkole	16	9,931	1,008	479	1,487
phase-II	Mao&komo	Upper Yabus	16	15,136	2,595	229	2,824
phase-II	Dangur	Biniyaro	18	12,445	1,120	134	1,254
phase-II	Bulen	Shar	14	8,408	1,109	318	1,427

phase-II	Wombera	Alelltu	15	12,157	3,362	643	4,005
phase-II	Agalometi	Meti	9	4,689	1,606	340	1,946
phase-II	Bellojiganfoy	Bishan Dima	11	14,579	750	100	850
RLLP	Asossa	Selga	18	9,866	7,377	2,279	9,656
RLLP	Yaso	Lugo	16	9,591	2,138	308	2,446
RLLP	Oda buldigilu	Buchi	14	8,522	1,285	584	1,869
RLLP	Dibate	Grengn	11	9,252	1,669	267	1,936

Source: NPCU project database

2.3 Stakeholders that participated in the survey:

The beneficiary survey targeted program stakeholders at the regional, Woreda, kebele, community and household levels. **At the regional level**, the stakeholders that were interviewed included representatives from the Bureau of Agriculture, Regional SLMP program Coordinators, Bureau of Land Administration (in their respective region), Bureau of Water, Irrigation and Energy, Bureau of Environment, Forest and Climate Change, Regional Agricultural Research Institutes (RARIs), Development partners at regional level and other staff for Bureaus of Agriculture (BoA)

At the Woreda level, the study participants included: Representatives from the Woreda Offices of Agriculture, Woreda Watershed Technical Committee (WTC), Woreda Steering Committee (WSC), Woreda Technical Committee (WTC), Woreda Focal Persons (WFP). At the Kebele level, they included Kebele Watershed Team (KWT), Keble Land Administration and Use Committee; **at the community**, we engaged Community watershed teams, members of households who belong to facility user groups who were organized and supported by the SLMP, while at the household level, we engaged both direct and indirect beneficiary who are Household heads, youth, and CIG groups members.

2.4 Sampling design

A combination of both **probability** and **non-probability** sampling were used in selecting participants for the beneficiary survey on selected results framework indicators of the project. Non-probability sampling mainly **purposive sampling, Convenience sampling** were used to select participants for qualitative data collection, while Probability sampling **(mainly Stratified, cluster & simple random sampling)** were used to select households to participate in the quantitative data collection.

Purposive sampling

Purposive sampling technique was employed to select representative participants for qualitative data methods such as Consultative meetings, Key informant interviews and Focus group discussion.

Multi-stage Stratified, cluster & simple sampling

Multi-stage sampling design was adopted in selecting the participants of the Beneficiary survey. The design articulated the six regions where the assignment was carried out. As explained in the stages below

Stage one (Stratifying the project area in regions)
This involved stratifying the project areas (Ethiopian highlands) into six regions. These include Amhara, Benishangul Gumuz, Gambella, Oromia, Sidama, Southern Nations, Nationalities and Peoples

Stage two (Grouping/Clustering Phases, Zones, Woredas, Major watersheds and Agro-ecological zones according to regions)

Major watersheds were grouped into phases (SLMP 1, SLMP-II and New RLLP watershed). These major watersheds were assigned random numbers in excel and 25 % of the Major watersheds in each of the phase were randomly selected and visited during the beneficiary survey.

Table 2: Phases, Zones Woredas Major watersheds & AEZs for the survey.

Region	Phases	No. of MW	25%Major watershed	Zone	Woreda	Name of sampled MW	AEZ for each sampled watershed
Amhara	SLMP-I	10	4	Central Gondar	Alefa	Matizirgi	Weyena Dega
				West Gojjam	Jabtehnan, Degadamot and Dembecha	Ketchem	Dega
				East Gojjam	Machakel	Ketech	Dega
				West Gojjam	Burie Zuria, Burie Town, and Guagusa	Yesir	Weyena Dega
	SLMP-II	24	7	Oromiya	Arthuma Fursi	Indodie	Weyena Dega
				Oromiya	Deweharewa	Dinkiye	Weyena Dega
				Waghmra	Sekota Zuria	Diba	Dega
				Waghmara	Gazgibla	Bela Amba	Dega
				South Gondar	Ebinat	Rib Ebnat	Dega
				Central Gondar	East Belesa	Zana	Dega
				Central Gondar	Chilga	Awuga	Weyena Dega
	New RLLP	10	1	Awi	Dangla	Awisi	Dega
Benshangul Gumuzi	SLMP I		1	Bambasi	Assosa	Sonka	Upper Kolla
	SLMP II		1	Homossa	Assosa	Telku Sherkole	Upper Kolla
	New RLLP		1	Odabuldgilu/Oda	Assosa	Buchi	Upper Kolla
Gambella	SLMP-I	3	1	Anywa	Gambella Zuriya	Wandong	Upper Kolla
	SLMP-II	3	1	Nuer	Makuey	Adura	Upper Kolla
Oromia	SLMP-I	14	5	SFOSZ	Sebeta Hawas	Dima	Dega
				East Wellegga	Gobu Sayo	Meki	Dega
				SFOSZ	Walmera	Wechecha	Weyena Dega

				North Shewa	Hidhebu Abote	Aleltu	Dega
				East Shewa	Gimbichu	Dalocha	Weyena Dega
	SLMP-II	25	7	West Shewa	Adea Berga	Bilacha	Weyena Dega
				West Shewa	Erjere	Berga	Dega
				Buno Beddelle	Gechi	Koba	Weyena Dega
				West Wellegga	Boji Dirmeji	Tobbi	Weyena Dega
				West Wellegga	Kondala	Ganfi	Dega
				Horo Guduru Wellegga	Abay Choman	Fincha	Weyena Dega
				North Shewa	AbayChomen	Finchaa	Dega
	New RLLP	5	2	East Wellegga	Leka Dullecha	Nagesso	Weyena Dega
				West Shewa	Meta Robi	Urga'a	Weyena Dega
SNNP	SLMP-I	9	4	Konta Special	Konta Special	Zigna	Weyena Dega
				Basketo Special	Basketo	Ergino	Weyena Dega
				Kefa	Adiyo	Geshi	Weyena Dega
				Dawuro	Mareka	Sheta	Weyena Dega
	SLMP-II	19	6	Kafa	Adyo	Adiyo	Weyena Dega
				Hadiya	Gibe	Handosha	Dega
				Yem special woreda	Yem special woreda	Kora	Weyena Dega
				Gurage	Gumer	Wabe	Weyena Dega
				Hawassa zuria	Hawassa Zuria	Hawassa zuria	Weyena Dega
				Hadia Zone	Soro	Ajacho	Weyena Dega
	New RLLP	4	1	Dawuro	Tercha zuraia	Dibissa	Weyena Dega
SIDAMA	SLMP-I	1	1	Wonsho		Orisha G-eo	Weyena Dega
	SLMP-II	1	1	Hawassa Zuria		Jara Enesa	Weyena Dega
Total		**170**	**44**				

Source: NPCU project database

Stage three: (Sampling of the households (direct beneficiaries of RLLP) to participate in the survey)

Two sample sizes (n_1 & n_2) were calculated using the Taro Yamane's (1967) formula below. The total number of male headed households in the 44 Sampled major watershed areas is **(N_1=93714)**, while the total number of the female headed households is **(N_2 = 16979)**

$$\text{Sample size } (n) = \frac{z^2 p(1-p) N}{z^2 P(1-P) + N(e)^2}$$

Using the above formula, we determined sample size **(n_1=1965)** and **(n_2=1332)** from **N_1** and **N_2** respectively

Whereby;

N_1 = total number of Male headed Households in the **44** selected watershed areas **(N_1= 93714)**[3]
N_2 = total number of Female headed Households in the **44** selected watershed areas **(N_2= 16979)**
e = level of precision or permissible error which is assumed to be 0.021. *(This was compared with Food Sufficiency for Farmers (FSF)-Implementation agreement document- CARE Ethiopia where research was conducted on watersheds and used margin of error (precision level) as 0.1)*

Z = value of the standard normal distribution given the chosen confidence level of 95% such that z= 1.96 at 95% level of confidence.
P = Probability of choosing a household in the watershed area estimated at 0.65 *(Justified by Number of hectares used by a household under improved technology, Number of farmers and others using improved technology and Volume of incremental sales)*

(n_1 = Sample size for Male headed Households =**1,965)**

(n_2 = Sample size for Female headed Households=**1,332)**

The combined sample size (both male and female headed households) **(n=3,297)**
The sample size (n) of the study participants was proportionately distributed to each of the 44 watershed areas basing on the number of both male and female headed households using a proportional allocation formula according to William G Cochran shown below.

$$\boldsymbol{n_i = \frac{N_i}{N} n}$$

$\boldsymbol{n_i}$=Number of respondents in each of the selected watershed areas
$\boldsymbol{N_i}$=Total number of both male & female headed households
n=Total sample size (both male and female headed households.

Stage four: (Sampling of the households (Indirect beneficiaries of RLLP) to participate in the survey)

It is important to note that the RLLP has not only benefited people within the Watershed areas; the assumption was that the project has benefited a number of indirect beneficiaries which include: Members of a communities adjacent to project intervention areas adopting SLM and Climate Smart Agriculture (CSA) practices through demonstration effects, as observed under SLMP-II; Private sector participants and end-consumers in value chains targeted by the project;

[3] **Sustainable Land Management Program Project Implementation Manual (PIM) of Resilient Landscapes and Livelihoods Project (RLLP) (2019 - 2026)**

Members of a household outside project areas who benefited from the creation of land certification capacity at woreda and regional level; Recipients of capacity building at all levels of government, as well as in national partner organizations; and members of a community outside project areas who benefited from groundwater recharge, reduced flooding, and lower sediment loads, as a result of SLMP interventions with an aim of building resilience.

13% of the total sample size of the direct beneficiaries was determined to cater of the indirect beneficiaries listed above (13% of **3297 is approximately 440).** Enumerators were guided by the Woreda watershed committee members to randomly select households in communities outside the watershed areas who could have benefited indirectly from the RLLP interventions.

Therefore, a total of **3737 households** was sampled for the beneficiary survey of RLLP selected indicators

Replacement of respondents.

With help regional coordinators, Woredas that were experiencing insecurity insurgencies at the time of data collection were later replaced. In cases where respondents were not found in their respective households at the time of interview; enumerators were authorized to skip those respective households and replaced them with the second next closest household dwelling within the same Watershed to ensure that the required number of households in the sampled watershed was achieved. This was being done with a help of DAs.

2.5 Response rate and adjusting the sample size for non-response

We set out to collect data from 3737 Households-Male and female headed and households of indirect beneficiaries; We however collected data from 3794 households. This represents more than 100% of the targeted beneficiaries of the household beneficiary survey of the RLLP.

Note that due to the on-going conflicts and insecurities in Tigray, some parts of Amhara and some parts of Oromia, some zones, Woredas and watersheds were replaced with safe and easily accessible Woredas and watersheds, but the sample size was maintained. Whereas we had planned to take **25%** of all the project major watersheds which falls within the 20-30% of the population as a sample size in form of a rule of thumb**, 44 watersheds** out of the **136 major watersheds** (excluding Tigray and some GAC watersheds in Amhara and Oromia) actually represents over **32%.** This therefore makes the findings of the survey credible. The table below the Woredas and watersheds that were visited during the survey data collection.

Table 3: Allocation of households to Major watersheds and Woredas

Woreda	Name of sampled MW	AEZ for each sampled watershed	Male headed HH	Proportion for Male headed HH	Sampled Male headed households	Female headed HH	Proportion of female headed HH	Sampled female headed households	Combined sample of both male & female headed HH	HH sample of indirect beneficiaries	Combined direct & indirect beneficiaries sample size
Gozamen	Dijil	Weyena Dega	1,457	0.02	31	179	0.01	14	45	10	55
Fagita	Guder	Dega	855	0.01	18	552	0.03	43	61	10	71
Jabi tenan	Ketchem	Dega	2,143	0.02	45	293	0.02	23	68	10	78
Machakel	Ketech	Weyena Dega	1,226	0.01	26	254	0.01	20	46	10	56
Burie, Town, Burie, Zuria, Guagusa	Yesir	Weyena Dega	1087	0.01	23	429	0.03	34	56	10	66
Gonji Kolela	Yezat	Weyena Dega	1897	0.02	40	590	0.03	46	86	10	96
Bibugn	Arefa	Dega	1681	0.02	35	689	0.04	54	89	10	99
Enefise sarmidir	Dendo	Dega	2336	0.02	49	883	0.05	69	118	10	128
Debay Tilat	Muga	Dega	2253	0.02	47	389	0.02	31	78	10	88
Basoliben	Yeda	Dega	2701	0.03	57	728	0.04	57	114	10	124
Dangila	Awisi	Weyena Dega	2730	0.03	57	748	0.04	59	116	10	126
Enarji enawuga	Chiye	Dega	2208	0.02	46	378	0.02	30	76	10	86
Bambasi	Hoha	Upper Kolla	2458	0.03	52	1005	0.06	79	130	10	140
Assosa	Sonka	Upper Kolla	1737	0.02	36	371	0.02	29	66	10	76
Homossa	Telku Sherkole	Upper Kolla	1,955	0.02	41	383	0.02	30	71	10	81
Goder	Ziey	Upper Kolla	1,120	0.01	23	134	0.01	11	34	10	44
Mengeshi	Fejeji	Upper Kolla	1,109	0.01	23	318	0.02	25	48	10	58
Gimbichu	Dolocha	Dega	1,285	0.01	27	584	0.03	46	73	10	83
Sigmo	Halu deneba	Dega	683	0.01	14	136	0.01	11	25	10	35
Omo Nada	Nada	Weyena Dega	1,922	0.02	40	497	0.03	39	79	10	89
Woliso	Rebu	Dega	570	0.01	12	489	0.03	38	50	10	60
Kersamalima	Tilikulemen	Weyena Dega	1,118	0.01	23	334	0.02	26	50	10	60
Kersa	Water	Weyena Dega	1,119	0.01	23	172	0.01	13	37	10	47
Wolmera	Wechecha	Dega	900	0.01	19	229	0.01	18	37	10	47
Ejere	Berga	Weyena Dega	1,887	0.02	40	254	0.01	20	59	10	69
Gumay	Dedesa	Weyena Dega	1,039	0.01	22	237	0.01	19	40	10	50
Boji Dirmeji	Gimbi	Dega	1,123	0.01	24	84	0	7	30	10	40
Mana	Guye	Weyena Dega	1,170	0.01	25	286	0.02	22	47	10	57
Haramaya	Harmaya	Dega	1,355	0.01	28	63	0	5	33	10	43
Wonchi	Walga	Weyena Dega	1,323	0.01	28	196	0.01	15	43	10	53
Tiyo	Ilu	Weyena Dega	2,438	0.03	51	307	0.02	24	75	10	85

Angacha	Azashuba	Weyena Dega	3,384	0.04	71	476	0.03	37	108	10	118
Mihur akilil	Begeze	Weyena Dega	2,150	0.02	45	426	0.03	33	79	10	89
Mirab Azernet	Degosa	Weyena Dega	2,150	0.02	45	426	0.03	33	79	10	89
Hulbarag	Dijo	Weyena Dega	2,793	0.03	59	267	0.02	21	80	10	90
Gibe	Handosha	Weyena Dega	2,207	0.02	46	273	0.02	21	68	10	78
Geta	Haram	Dega	7,708	0.08	162	369	0.02	29	191	10	201
Geze Gofa	Mito	Weyena Dega	2,741	0.03	57	261	0.02	20	78	10	88
Kindo didaye	Omo	Weyena Dega	1,694	0.02	36	322	0.02	25	61	10	71
Gumer	Wabe	Weyena Dega	1,491	0.02	31	352	0.02	28	59	10	69
Oyda	Zenti	Weyena Dega	2,469	0.03	52	425	0.03	33	85	10	95
Endegagn	Dibissa	Weyena Dega	2,207	0.02	46	273	0.02	21	68	10	78
Wonsho	Orisha G-eo	Weyena Dega	7,708	0.08	162	369	0.02	29	191	10	201
Hawassa Zuria	Jara Enesa	Weyena Dega	6,127	0.07	128	549	0.03	43	172	10	182
Total			**93,714**	**1**	**1965**	**16979**	**1**	**1332**	3297	**440**	**3737**

Source: NPCU project database

2.6 Sampling of the Woreda information centers and users

A combination of both **purposive** and **convenience** sampling techniques was used in selecting the WICs and users (primary & secondary targets) respectively. Woreda information centers in SLMP-II phase in each of the six regions were sampled for the assessment. It is important to note that even among the SLMP-II Woredas, some of the them were not accessible during the data collection exercise due to the ongoing war. The consultant team therefore focused on only those that were accessible thereby collecting data from 26 WICs.

Sampling of WICs users

It is important to note that users of WICs are categorized into primary and secondary targeted users. Whereas the primary targets are well known and their population can easily be traced to allow sampling, Secondary targets (Members of TVET, Researchers and academic publishers) cannot easily be traced; and this kind of population in **statistical sampling is regarded an infinite population**. The statistical formula that was used in sampling survey respondents from an infinite population is:

$$n = \left(\frac{Z\frac{\alpha}{2}}{E}\right)^2 pq$$

Where: $Z\frac{\alpha}{2} = 1.96$, p=q=0.5, E= (Margin of error) =0.038

Using the above sampling parameters, the sample size of WIC users (n)=**85**

A separate tool for data collection tool was used to capture WIC user's opinions and verifying whether the WIC serve the intended targeted beneficiaries and purpose.

2.7 Process of reaching the targeted participants

a) Introductory letters phone calls and scheduling appointments

Introductory letters clearly indicating the purpose of the beneficiary survey were written and shared by NPCU with the six regions where the survey was carried out These letters were accompanied by phones calls to schedule appointments with the different stakeholders at the regions who also wrote to the Woreda stakeholders where the data collection exercise was conducted.

b) Brief meeting with the Regional project coordination unit

The team of consultants was received by RLLP regional coordinator who will introduce the team to the rest of the stakeholders to participate in the study to briefly explain the purpose of the visit as well as gathering any other key documentation/reports that were available for the survey.

c) Consultative meetings:

Consultative meetings were held with identified stakeholders; in these meetings the RLLP coordinators assigned focal persons and development agents (DAs) to travel with the enumerators to the different watersheds areas to introduce the team to the community and request the community around the watershed to participate in the interviews; Focus group discussions and Household satisfaction questionnaires.

2.8 Data collection methods

A combination of both quantitative and qualitative data collection methods was used. These included administering the beneficiary household questionnaire, document review, Focus Group Discussions (FGDs), Key Informant Interviews (KIIs), Site visits and Photography

2.9 Data analysis

2.9.1 Quantitative data analysis.

The electronic data collection platform used the KoBo Collect, pass worded CPAS owned platform for collecting data accurately, quickly, offline and at scale with smart forms on mobile phones and tablets. The server was able to track and map data as it came in from the field in real-time. After data capture and cleaning, data analysis was done in STATA, SPSS, and MS-Excel. Data were analyzed using descriptive and inferential statistics. Descriptive statistics described the achievement of the project on selected results **Indicators.**

2.9.2 Inferential statistics

It is important to note that inferential statistics **make sense** whenever the different assumptions of the model are cross-checked and satisfied. In regards with particular survey, the data collected on some of the indicators do not satisfy the different assumptions and as a result, were not analyzed using inferential statistics. The post estimation tests for non-violation of the different assumptions are indicated in Annexes 6 & 7 this final report. The survey team employed a number of statistical tests which include: The Bonferroni test, Mann-Whitney U test, Kruskal-Wallis H test and the Paired sample t-test. The results of the tests are distributed in the different sections of the report.

2.9.3 Computation of the figures and statistics on selected indicators

The quantitative findings of the study on the selected indicators were computed using a general formula of making inferences from random samples **(According to the common core state standards for mathematics (CCSS.MATH. CONTENT.7. SP.A.1, 7SP.A.2-May 2020)).**

$$\text{Sample : Population} \ldots\ldots\ldots (1)$$

$$\frac{\text{Finings of the study}}{\text{Total sample size}} = \frac{\text{Unknown}}{\text{Targeted beneficiaries}} \ldots\ldots\ldots (2)$$

The formula assumes that the findings of the study are directly proportional to the targeted population; and it is line with the assumption of the Taro Yamane's (1967) formula below.

Sample size (n)=$\frac{z^2p(1-p)N}{z^2P(1-P)+N(e)^2}$ and the proportional allocation formula according to William G Cochran shown below. $n_i = \frac{N_i}{N} n$ whereby

n_i=Number of respondents in each of the selected watershed areas
N_i=Total number of both male & female headed households
n=Total sample size (both male and female headed households

2.9.4 Qualitative data analysis:

Audio recorded data and field notes were transcribed and typed in MS-Word. Qualitative data were analyzed using thematic and content analysis techniques. In some cases, direct quotes were used to present results. Themes generated provided insight into the four main thematic areas of analysis and reporting (Adoption of diversified livelihood activities, land users adopting sustainable land management practices, Beneficiary satisfaction survey as well as the effectiveness of the Woreda information centers.

2.10 Reliability and validity issues Adherence.

2.10.1 Reliability:

Reliability is the extent to which the applied data collection techniques provide consistent findings (Saunders et al., 2009). All construct measures with α above 0.5 were an indication that there was reliability and internal consistency since α is within the acceptable range above the minimum recommended 0.5

2.10.2 Validity

The data collection tools (i.e. household questionnaire, KII guide and FGD guide) used to collect data for the beneficiary survey were created to ensure they have content validity by allowing adequate coverage of the objectives under study. In addition, the assessment team ensured the existence of construct validity by creating the research instrument (questionnaires) with a sound base in theory and conforming to the theoretical body of knowledge. The tools addressed the objective of the study. The questionnaire was pre-tested and feedback from pretest was incorporated in the final design of the tool. Effort was made to ensure logical flow of questions, and use of simple language in the tools. The survey tool was not self-administered but interviewer-administered using computer assisted personal interviewing (CAPI). To ensure validity of

qualitative data, a phenomenological approach was used. Study participants with lived experiences related to the subject under study were included in the study.

In addition, other measures that were undertaken to ensure quality data collection included the following: Recruitment of qualified Research Assistants with local language competence in the study sites and experience in data collection; Training of Research Assistants and supervision during data collection and daily debriefs

2.11 Team composition

A team composed of 10 consultants with multi-disciplinary background in the areas of Agricultural economics, economics & demography, Natural Resources & Environment, Business administration, Communication & Social protection, Agriculture & Rural extension, Applied statistics, Quantitative Economics, Social sector, Monitoring & Evaluation expert and economics conducted the assessment, directly accountable to the overall team leader of the Beneficiary survey, an experienced member of the team led each assessment team during the field visit and data collection process. The CEO along with other support and technical staff based at the AHC office in Addis Ababa, managed the logistics, provided technical (internal quality assurance of the reports), administrative and other necessary supports to the team of consultants for the assignment.

2.12 Limitations to the beneficiary assessment

i. Delays to make field visits to the Woreda and Watersheds due to insecurities and conflicts in the different zones that make up the project implementation areas. To address this limitation, the team of consultants was flexible enough to start with Woredas that were relatively safe. For example, some waredas especially in the regions of Oromia and Amhara that were previously sampled were later replaced due to insecurity insurgencies in these areas.

ii. The heavy rain fall did not only affect the movement of enumerators from one household to another during data collection process, but also made some of the roads inaccessible for the vehicles that were used by the consultants. This made it difficult for teams to access some micro watersheds and other sampled households. This was addressed by providing umbrellas to all the enumerators to enable them move from one household to another to undertake the data collection exercise.

iii. The nature of landscape of some watersheds. Most of the watersheds that were randomly selected are far from the Woredas and the roads to these areas are so rough, with rocks, hills and steep slopes which made it difficult for the vehicles to access them. We experienced a number of wreckages of the vehicles due to the poor nature of the roads which in a way delayed our process of collecting data.

Nature of the roads during the data collection exercise in SNNPR & Oromia

3. KEY FINDINGS OF THE SURVEY

3.1 Overview.

This section presents key findings of the beneficiary survey for RLLP selected indicators. The findings mainly relate to the four thematic areas of reporting as stipulated in the Terms of reference which include: Adoption of Livelihoods Diversification, Beneficiary Satisfaction Survey, Land users adopting sustainable land management practices, Woredas information centers being effectively used by project stakeholders and other aspects of the beneficiary survey such as lessons learnt, sustainability of the project, challenges related to project implementation, recommendations and conclusions.

3.2 Basis of the RLLP achievement on selected indicators.

The computation of the achievement of RLLP on the selected indicated was informed by informed by the cumulative beneficiary target as of July 7th 202. This is because the survey data collection exercise was conducted between August and September 202.

Table 4: Basis for computing RLLP achievement on selected indicators

No	Result Framework indicators	Unit	Project end target	Project Net end target	MTR Target	Cumulative up to July 07, 2021	% from MTR	% from Net End Target
A	**PDO Indicators by Objectives / Outcomes**							
PDO 5	Households adopting diversified livelihood activities supported by the project	No	211,300	211,300	80,802	173,326	214.5	82
5a	Female-headed households participating in diversified livelihood activities supported by the project	No	37,000	37,000	14,144	29526	209	80
B	**Intermediate Results Indicators by Components**							
IR1	Share of target beneficiaries with rating 'Satisfied' or above on project interventions (aspects: livelihoods, environmental benefits, others)	%	65	65	50	89.3	179	137.4
1a	Share of target women beneficiaries with rating 'Satisfied' or above on project interventions	%	65	65	50	91.7	183.4	141.1
IR4	Land users adopting sustainable land management practices as a result of the project	No	506,000	506,000	193,501	431,023	222.7	85.2
4a	Women land users adopting sustainable land management practices as a result of the project	No	276,000	276,000	105,410	212,613	201.7	77.0
4b	Female headed households adopting sustainable land management practices as a result of the project	No	47,300	47,300	18,088	37,493	207.3	79.3

Source: NPCU project database

3.3 Summary of achievement of project on the specific PDO indicators selected for the survey.

Note that the PDO is to **Improve climate resilience, land productivity and carbon storage, and increase access to diversified livelihood activities in selected rural watersheds.** Building resilience was assessed basing on three capacities of Absorptive, adaptive and transformative capacities. The assessment of **absorptive capacity** focused on two major aspects (Adoption of Climate smart agriculture and the adoption of sustainable land management practices); **Adaptive capacity** was assessed basing on adoption of diversified livelihood activities; **transformative capacity** was assessed basing on adoption of the different kinds of technologies, approaches and practices such SWC, ISFM, Farm water & moisture management practices, environmentally friendly forage development practices, crop diversity practices and water harvesting structures. The findings of the survey indicate that absorptive capacity is at 80.5%, Adaptive capacity is at 72.3%; while transformative capacity is at 58.4%. It is important to note that although the adoption of CSA practices is not among the selected PDO results indicators, it was assessed because it is one of the components of absorptive capacity which is expected to improve resilience. The table below summarizes the findings of the study in relation to the selected PDO indicators

Table 5: Summary of the study findings on selected PDO indicators

PDO	specific capacities of resilience to feed into the PDO	Indicators	Specific indicators	July 2021 cumulative target	Achievement as at 7th July 2021	Percentage achievement at mid-term	Concluding remarks
Improve climate resilience, land productivity and carbon storage, and increase access to diversified livelihood activities in selected rural watersheds	Absorptive capacity	Climate smart agriculture	HH adopting CSA practices	173,326	120,240	69.3%	80.5% of the target beneficiaries have attained absorptive capacity
			Female headed HH adopting CSA practices	29526	23018	77.9%	
			Women adopting CSA practices	212613	137874	64.8%	
		Adoption of sustainable land management practices	Land users adopting SLM practices	431,023	403871	97.3%	
			Women land users adopting SLM practices	212617	180,817	87%	
			Female headed HH adopting SLM practices	37493	32690	87%	
	Adaptive capacity	Adoption of diversified	Households adopting diversified livelihood activities	173,326	155,280	89.5%	72.36% of the target beneficiaries

		livelihood activities	Female headed households adopting diversified livelihood activities	29526	25606	86.7%	have attained adaptive capacity
			Households adopting on-farm	173,326	157,199	90.6%	
			Households adopting off-farm	173,326	123,438	71.2%	
			Households adopting non-farm	173,326	41298	23.8%	
	Transformative capacity	Different kinds of technologies, approaches and practices.	SWC technologies				58.4% of the target beneficiaries have developed transformative capacity
			Households adopting SWC	173,326	131267	75%	
			Female headed households adopting SWC	29526	25946	88%	
			ISFM				
			Households adopting ISFM	173,326	79764	46%	
			Female headed households adopting ISFM	29526	16254	55%	
			Farm water & moisture management practices				
			Households adopting farm water & moisture management practices	173,326	92465	53,3%	
			Female headed households adopting farm water and moisture management practices	29526	19148	64.8	
			Environmentally friendly forage development practices				
			Households adopting environmentally friendly forage development practices	173,326	72409	41.7%	

			Female headed households adopting environmentally friendly forage development practices	29526	13482	50%	
			Crop diversity practices				
			Households adopting diversity practices	173,326	79490	45.8%	
			Female headed households adopting diversity practices	29526	16540	56%	
			Water harvesting structures				
			Households adopting Water harvesting structures	173,326	86891	50%	
			Female headed households adopting Water harvesting structures	29526	16147	60%	

Source: RLLP beneficiary household questionnaire

3.4 Adoption of Livelihoods Diversification

3.4.1 The Rate of livelihoods activity diversification

The rate of livelihood activity diversification refers to a combination of the rate of SWC, the rate of CSA, the rate of livelihood and rate of participation in value chain activities. Note that the rate of adopting SWC is 89%%, the rate of adopting CSA is 70.6%, the rate of adopting nontraditional livelihood activities is 72.36% and the rate of participation in value chain activities is 48%. Therefore, the average rate of livelihood diversification is 72.9% (approximately 73%)

3.4.1.1 Households adopting diversified livelihood activities supported by the project

This indicator was measured as the percent of households engaging in approved, non-traditional activities, relative to the total number of households in the project area. Diversified livelihood activities are the ones expected to reduce households' vulnerability to future shocks associated with extreme weather events and climate change thereby increasing the resilience of natural (i.e. land) resources. **The summary of diversified livelihood activities is** (Apiculture, poultry, sheep & goat fattening, vegetable growing, fruit farming, cash crop growing, improved cook stove production and marketing). The diversified livelihood activities are sub categorized into three; that is: **On farm income** generating activities (Trees for commercial purposes, Planting of fruits, Planting of root crop, improved & drought resistant crop varieties, pulse crop production, Tea and coffee planting, Planting Cereals); **Off-farm** income generating activities (Bee keeping, Sheep and goat fattening, Poultry, Fishery, Sericulture, Vermin-composting) and **Non-farm** income generating (Bamboo processing, Cook stove production, Petty trade, Masonry, Charcoal, Brewery)

$$\text{HHs adopting diversified livelihood activities} = \frac{\text{Findings of the study}}{\text{Total sample size}} \times \text{July 2021 cumul target}$$

$$\text{HHs adopting diversified livelihood activities} = \frac{3399}{3794} \times 173{,}326 = 155280$$

From the computation above a total of 155,280 households were found to have adopted the different diversified livelihood practices This represents 89.5% of the July 2021 cumulative target beneficiaries.

3.4.1.2 Female headed households adopting diversified livelihood activities

$$\text{Female headed HHs adopting diversfied livelihood activities} = \frac{\text{Findings of the study}}{\text{Total sample size}} \times \text{July 2021 cumul target}$$

$$\text{Female headed HHs adopting diversified livelihood activities} = \frac{980}{1130} \times 29526 = 25606$$

From the computation above a total of 25606 female headed households were found to have adopted the different diversified livelihood practices. This represents over 86% of the July 2021 cumulative target beneficiaries.

3.4.2 Community user groups adopting SWC technologies on communal lands.

3.4.2.1 Community user groups adopting SWC technologies on communal lands at the regional level

SWC technologies include but not limited to different kind of terraces and moisture harvesting structures, area-closure, gully rehabilitation, pastureland management among others. The findings of the study indicate that a total of 739 groups have adopted the different soils and water conservation technologies on communal lands in the six regions that were visited during the survey. Table1 below summarizes the number of groups adopting SWC in each of the six regions

Table 6: Summary of Community user groups adopting SWC technologies on communal land

#	Region	Number of groups adopting SWC on communal land
1	Amhara	35
2	Benshangul Gumuzi	59
3	Oromia	109
4	Gambela	64
5	SNNPR	75
6	Sidama	397
	Total	**739**

Source: Primary data collected by the consultants verified with RLLP Annual reports.

3.4.3 Households adopting SWC technologies.

3.4.3.1 Households adopting SWC technologies at project level.

The total number of households adopting SWC were determined using the formula below that was derived from the general proportional formula in equation (2) in section 2.9.3 above.

$$\text{HHs adopting SWC technologies} = \frac{\text{Findings of the study}}{\text{Total sample size}} \times \text{July 2021 cumul target}$$

$$\text{HHs adopting SWC technologies} = \frac{3425}{3794} \times 173{,}326$$

From the computation above, a total of **156,468** have already adopted and practicing soil and water conservation technologies. This represents over 90% of the targeted households that are expected to adopt soil and water conservation technologies as of July 2021 on their farmlands.

3.4.3.2 Adoption of SWC technologies disaggregated by category of HH head

Out of the of 3425 total household heads who adopted SWC technologies, 71% were male headed households and 29% were female headed. Table below describes the adoption of SWC technologies disaggregated by gender of the household head.

Table 7: adoption of SWC technologies disaggregated by gender of the household head

Category of the Household	Count	Percent
Male headed	2432	71
Female headed	993	29
Total	**3425**	**100**

Using the formula below that was derived from the general proportional formula in equation (2) in section 2.9.3 above.

$$\text{Male headed HHs adopting SWC technologies} = \frac{\text{Findings of the study}}{\text{Sample size for MHH}} \times \text{Target MHH}$$

$$\text{Male headed HHs adopting SWC technologies} = \frac{2432}{2664} \times 143{,}800$$

The total number of **male headed households** adopting SWC technologies is **131,267**. This implies that 91% of the targeted Male headed households (158400 HH) have adopted soil and water conservations on their farmlands.

$$\text{Female headed HHs adopting SWC technologies} = \frac{\text{Findings of the study}}{\text{Sample size for FHH}} \times \text{July 2021 cumul target}$$

$$\text{Female headed HHs adopting SWC technologies} = \frac{993}{1130} \times 29526$$

From the computation above, a total of **25,946 of female headed households had** adopted SWC technologies as of July 2021. This represents 88% of the targeted female headed households for the July 2021 cumulative target.

3.4.3.3 Adoption of SWC approaches and technologies per region and SLMP phase.

The analysis revealed that more male headed households have adopted the SWC technologies compared to their female counterparts. The survey further discovered that watersheds in SLMP-II had more adoption of the SWC technologies compared to both SLMP-I and RLLP/SLMP-III. The table below describes the adoption of SWC technologies disaggregated by region, phases, the specific Soil and water conservation technologies together with the gender of the household head.

Table 8: Adoption of specific SWC technologies

Region	Phase	SWC technologies on farm land	Statistics of HH adopting SWC	Disaggregation by gender		
				Male headed	Female headed	Total
Amhara	SLMP-I	Different kind of terraces	Number (#)	194	12	206
			Percent (%)	93	7	100
		Moisture harvesting structures	Number (#)	91	115	206
			Percentage (%)	44	56	100
	SLMP-II	Different kind of terraces	Number (#)	378	44	422
			Percent (%)	89	11	100
		Moisture harvesting structures	Number (#)	256	166	422
			Percent (%)	61	39	100
	SLMP-III (RLLP)	Different kind of terraces	Number (#)	415	24	439
			Percent (%)	94	6	100
		Moisture harvesting structures	Number (#)	253	186	439
			Percent (%)	57	43	100
Benshangul Gumuzi	SLMP-1	Different kind of terraces	Number (#)	170	35	205
			Percent (%)	83	17	100
		Moisture harvesting structures	Number (#)	78	157	235
			Percent (%)	33	67	100

	SLMP-II	Different kind of terraces	Number (#)	67	10	77
			Percent (%)	87	13	100
		Moisture harvesting structures	Number (#)	23	54	77
			Percent (%)	29	61	100
Gambela	SLMP-1	Different kind of terraces	Number (#)	21	46	67
			Percent (%)	31	69	100
		Moisture harvesting structures	Number (#)	36	31	67
			Percent (%)	53	47	100
	SLMP-II	Different kind of terraces	Number (#)	5	29	34
			Percent (%)	15	85	100
		Moisture harvesting structures	Number (#)	11	23	34
			Percent (%)	32	68	100
Oromia	SLMP-I	Different kind of terraces	Number (#)	514	74	588
			Percent (%)	87	13	100
		Moisture harvesting structures	Number (#)	356	232	588
			Percent (%)	61	39	100
	SLMP-II	Different kind of terraces	Number (#)	295	54	349
			Percent (%)	84	16	100
		Moisture harvesting structures	Number (#)	217	132	349
			Percent (%)	61	39	100
	RLLP	Different kind of terraces	Number (#)	98	17	115
			Percent (%)	85	15	100
		Moisture harvesting structures	Number (#)	78	37	115
			Percent (%)	69	31	100
SNNPR	SLMP-I	Different kind of terraces	Number (#)	165	4	169
			Percent (%)	97	3	100
		Moisture harvesting structures	Number (#)	89	80	169
			Percent (%)	52	48	100
	SLMP-II	Different kind of terraces	Number (#)	722	52	774
			Percent (%)	93	7	100
		Moisture harvesting structures	Number (#)	246	528	774
			Percent (%)	32	68	100
	RLLP	Different kind of terraces	Number (#)	75	2	77
			Percent (%)	97	3	100
		Moisture harvesting structures	Number (#)	42	35	77
			Percent (%)	55	45	100
Sidama	SLMP-I	Different kind of terraces	Number (#)	83	6	89
			Percent (%)	93	7	100
		Moisture harvesting structures	Number (#)	53	36	89
			Percent (%)	59	41	100
	SLMP-II	Different kind of terraces	Percent (%)	178	5	183
			Percent (%)	97	3	100
		Moisture harvesting structures	Number (#)	127	56	183
			Percent (%)	69	31	100

Source: RLLP beneficiary household questionnaire

Table 9: Adoption of soil and water conservation approaches

Region	Phase	SWC approaches	Statistics of HH adopting SWC approaches	Disaggregation by gender		
				Male headed	Female headed	Total
Amhara	SLMP-I	Area-closure,	Number (#)	323	99	422
			Percent (%)	76	24	100
		Gully rehabilitation,	Number (#)	184	238	422
			Percent (%)	43	57	100
		Pasture land management	Number (#)	176	246	422
			Percent (%)	41	59	100
	SLMP-II	Area-closure,	Number (#)	323	99	422
			Percent (%)	76	24	100
		Gully rehabilitation,	Number (#)	152	287	439
			Percent (%)	35	65	100
		Pasture land management	Number (#)	210	229	439
			Percent (%)	48	52	100
	SLMP-III (RLLP)	Area-closure,	Number (#)	333	106	439
			Percent (%)	76	24	100
		Gully rehabilitation,	Number (#)	53	153	206
			Percent (%)	26	74	100
		Pasture land management	Number (#)	105	101	206
			Percent (%)	51	49	100
Benshangul Gumuzi	SLMP-I	Area-closure,	Number (#)	118	87	205
			Percent (%)	58	42	100
		Gully rehabilitation,	Number (#)	62	143	205
			Percent (%)	30	70	100
		Pasture land management	Number (#)	166	39	205
			Percent (%)	81	19	100
	SLMP-II	Area-closure,	Number (#)	47	30	77
			Percent (%)	61	39	100
		Gully rehabilitation,	Number (#)	9	68	77
			Percent (%)	12	88	100
		Pasture land management	Number (#)	8	69	77
			Percent (%)	11	89	100
Gambela	SLMP-1	Area-closure,	Number (#)	50	17	67
			Percent (%)	75	25	100
		Gully rehabilitation,	Number (#)	50	17	67
			Percent (%)	75	25	100
		Pasture land management	Number (#)	50	17	67
			Percent (%)	75	25	100
	SLMP-II	Area-closure,	Number (#)	17	17	34
			Percent (%)	50	50	100
		Gully rehabilitation,	Number (#)	10	24	34
			Percent (%)	29	71	100
		Pasture land management	Number (#)	12	22	34
			Percent (%)	35	65	100
Oromia	SLMP-I	Area-closure,	Number (#)	224	364	588
			Percent (%)	38	62	100

		Gully rehabilitation,	Number (#)	143	105	248
			Percent (%)	57	47	100
		Pasture land management	Number (#)	126	122	248
			Percent (%)	51	49	100
	SLMP-II	Area-closure,	Number (#)	150	199	349
			Percent (%)	43	57	100
		Gully rehabilitation,	Number (#)	99	57	156
			Percent (%)	63	37	100
		Pasture land management	Number (#)	87	69	156
			Percent (%)	56	44	100
	New RLLP	Area-closure,	Number (#)	32	83	115
			Percent (%)	27	73	100
		Gully rehabilitation,	Number (#)	75	38	113
			Percent (%)	66	34	100
		Pasture land management	Number (#)	60	53	113
			Percent (%)	53	47	100
SNNPR	SLMP-I	Area-closure,	Number (#)	136	33	169
			Percent (%)	80	20	100
		Gully rehabilitation,	Number (#)	67	14	81
			Percent (%)	83	17	100
		Pasture land management	Number (#)	58	23	81
			Percent (%)	71	29	100
	SLMP-II	Area-closure,	Number (#)	549	225	774
			Percent (%)	71	29	100
		Gully rehabilitation,	Number (#)	157	83	240
			Percent (%)	64	36	100
		Pasture land management	Number (#)	164	76	240
			Percent (%)	68	32	100
	New RLLP	Area-closure,	Number (#)	49	28	77
			Percent (%)	63	37	100
		Gully rehabilitation,	Number (#)	41	36	77
			Percent (%)	53	47	100
		Pasture land management	Number (#)	38	39	77
			Percent (%)	49	51	100
Sidama	SLMP-I	Area-closure,	Number (#)	47	42	89
			Percent (%)	53	47	100
	SLMP-II	Area-closure,	Number (#)	105	78	183
			Percent (%)	57	43	100

Source: RLLP beneficiary household questionnaire

3.5 Climate smart agriculture

It is important to note that interventions under climate smart agriculture were aimed at enhancing the livelihood resilience of beneficiary households. The improved adaptation of restored watersheds to variable rainfall patterns and adverse climatic events, combined with reduced degradation-related risks were expected to provide suitable conditions for beneficiaries to adopt improved, climate-smart farming practices and diversify and/or intensify their current production systems. The sections below provide an analysis of how the beneficiaries adopted specific climate, smart agriculture practices.

3.5.1 Households adopting climate smart agriculture practices

$$\text{HHs adopting CSA practices} = \frac{\text{Findings of the study}}{\text{Total sample size}} \times \text{July 2021 cumulative target}$$

$$\text{HHs adopting CSA practices} = \frac{2632}{3794} \times 173326$$

A total of **120,240** households have already adopted climate smart agriculture practices. This represents 69.3% of the targeted beneficiaries and affirms that in the remaining two years of project implementation, the end target households will be realized.

$$\text{Female headed HHs adopting CSA practices} = \frac{\text{Findings of the study}}{\text{Total sample size}} \times \text{uly 2021 cumulative target}$$

$$\text{Female headed HHs adopting CSA practices} = \frac{803}{1030} \times 29526$$

A total of **23018** female headed households have adopted and practiced climate smart agriculture practices; this represents 77.9% of July 2021 cumulative target.

3.5.2 Women land users adopting CSA practices

A total of 137,874 women have adopted and practiced the different forms of climate smart agriculture practices. This represents 64.8% of the July 2021 cumulative targeted women beneficiaries

$$\text{Women land users adopting CSA practices} = \frac{\text{Findings of the study}}{\text{Total sample size}} \times \text{uly 2021 cumulative targe}$$

$$\text{Women land users adopting CSA practices} = \frac{808}{1246} \times 212613$$

3.5.3 Adoption of CSA (regional analysis)

Amhara, SNNP, Oromia and Sidama are slightly ahead of the other two regions (Gambela & Benshangul) as far as the adoption of the specific climate smart agricultural practices are concerned. Within the regions, Mulching, improved tillage, road water harvesting are highly practiced in SNNPR, Vermi-composting, manure management and intercropping are highly practiced in Amhara, Provision of improved farm tools (Machinery for tillage), Improved composite making, Bio slurry and Lime and Gypsum application for acidic and alkaline soils are highly practiced in Oromia; while Promotion of tree-planting, Promotion of crop rotation, Promotion of legume intercropping and ensuring access to drought and disease resistant crops are highly practiced in Gambela, Benshangul Gumuz, and Sidama. The table below illustrates the rate of adoption and practice of CSA practices within and across the regions.

Table 10: CSA practices within and across the regions

Climate smart agricultural practices		Region of the respondent																			
		Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR			Total	
		Count	Row N %	Col N %	Count	Row N %	Col N %	Count	Row N %	Col N %	Count	Row N %	Col N %	Count	Row N %	Col N %	Count	Row N %	Col N %	count	percent
Mulching	No	312	26.9	32	78	6.7	33.5	33	2.8	44	272	23.5	29.7	123	10.6	48.6	341	29.4	35.9	1159	34.1
	Yes	664	29.6	68	155	6.9	66.5	42	1.9	56	643	28.7	70.3	130	5.8	51.4	609	27.2	64.1	2243	65.9
Improved tillage	No	437	27.2	44.8	110	6.8	47.2	52	3.2	69.3	608	37.9	66.4	80	5	31.6	319	19.9	33.6	1606	47.2
	Yes	539	30	55.2	123	6.8	52.8	23	1.3	30.7	307	17.1	33.6	173	9.6	68.4	631	35.1	66.4	1796	52.8
Water harvesting through cut off drains	No	712	33.1	73	149	6.9	63.9	41	1.9	54.7	446	20.7	48.7	149	6.9	58.9	653	30.4	68.7	2150	63.2
	Yes	264	21.1	27	84	6.7	36.1	34	2.7	45.3	469	37.5	51.3	104	8.3	41.1	297	23.7	31.3	1252	36.8
Road water harvesting	No	703	27.70%	72	173	6.8	74.2	58	2.3	77.3	615	24.3	67.2	184	7.3	72.7	801	31.6	84.3	2534	74.5
	Yes	273	31.5	28	60	6.9	25.8	17	2	22.7	300	34.6	32.8	69	7.9	27.3	149	17.2	15.7	868	25.5
Provision of improved farm tools (Machinery for tillage)	No	769	30.3	78.8	174	6.9	74.7	68	2.7	90.7	558	22	61	195	7.7	77.1	771	30.4	81.2	2535	74.5
	Yes	207	23.9	21.2	59	6.8	25.3	7	0.8	9.3	357	41.2	39	58	6.7	22.9	179	20.6	18.8	867	25.5

Improved composite making	No	400	19.3	41	186	9	79.8	59	2.9	78.7	448	21.6	49	185	8.9	73.1	792	38.3	83.4	2070	60.8
	Yes	576	43.2	59	47	3.5	20.2	16	1.2	21.3	467	35.1	51	68	5.1	26.9	158	11.9	16.6	1332	39.2
Bio slurry	No	872	27.5	89.3	224	7.1	96.1	73	2.3	97.3	826	26	90.3	244	7.7	96.4	936	29.5	98.5	3175	93.3
	Yes	104	45.8	10.7	9	4	3.9	2	0.9	2.7	89	39.2	9.7	9	4	3.6	14	6.2	1.5	227	6.7
Vermicomposting and manure management	No	660	25.2	67.6	200	7.6	85.8	67	2.6	89.3	569	21.7	62.2	243	9.3	96	885	33.7	93.2	2624	77.1
	Yes	316	40.6	32.4	33	4.2	14.2	8	1	10.7	346	44.5	37.8	10	1.3	4	65	8.4	6.8	778	22.9
Lime and Gypsum application for acidic and alkaline soils	No	933	30.4	95.6	213	6.9	91.4	75	2.4	100	724	23.6	79.1	249	8.1	98.4	874	28.5	92	3068	90.2
	Yes	43	12.9	4.4	20	6	8.6	0	0	0	191	57.2	20.9	4	1.2	1.6	76	22.8	8	334	9.8
Promotion of tree-planting	No	647	35.5	66.3	195	10.7	83.7	31	1.7	41.3	301	16.5	32.9	155	8.5	61.3	495	27.1	52.1	1824	53.6
	Yes	329	20.8	33.7	38	2.4	16.3	44	2.8	58.7	614	38.9	67.1	98	6.2	38.7	455	28.8	47.9	1578	46.4
Promotion of crop rotation	No	534	32	54.7	198	11.9	85	27	1.6	36	337	20.2	36.8	140	8.4	55.3	432	25.9	45.5	1668	49.0
	Yes	442	25.5	45.3	35	2	15	48	2.8	64	578	33.3	63.2	113	6.5	44.7	518	29.9	54.5	1734	51.0
Promotion of legume intercropping	No	891	32.4	91.3	208	7.6	89.3	64	2.3	85.3	668	24.3	73	212	7.7	83.8	703	25.6	74	2746	80.7
	Yes	85	13	8.7	25	3.8	10.7	11	1.7	14.7	247	37.7	27	41	6.2	16.2	247	37.7	26	656	19.3
Ensuring access to drought and disease resistant crops	No	948	33.4	97.1	221	7.8	94.8	69	2.4	92	627	22.1	68.5	226	8	89.3	745	26.3	78.4	2836	83.4
	Yes	28	4.9	2.9	12	2.1	5.2	6	1.1	8	288	50.9	31.5	27	4.8	10.7	205	36.2	21.6	566	16.6
Promoting of integrated pest and disease management	No	896	31.6	91.8	224	7.9	96.1	67	2.4	89.3	641	22.6	70.1	235	8.3	92.9	769	27.2	80.9	2832	83.2
	Yes	80	14	8.2	9	1.6	3.9	8	1.4	10.7	274	48.1	29.9	18	3.2	7.1	181	31.8	19.1	570	16.8

Promoting post-harvest management	No	851	30.5	87.2	218	7.8	93.6	62	2.2	82.7	635	22.7	69.4	241	8.6	95.3	786	28.1	82.7	2793	82.1
	Yes	125	20.5	12.8	15	2.5	6.4	13	2.1	17.3	280	46	30.6	12	2	4.7	164	26.9	17.3	609	17.9
Line plants	No	865	33.9	88.6	223	8.7	95.7	50	2	66.7	541	21.2	59.1	191	7.5	75.5	680	26.7	71.6	2550	75.0
	Yes	111	13	11.4	10	1.2	4.3	25	2.9	33.3	374	43.9	40.9	62	7.3	24.5	270	31.7	28.4	852	25.0

Source: 2021 RLLP beneficiary household questionnaire,

3.5.4 Adoption of CSA practices within and along the phases.

It is important to note that RLLP comprises of watersheds in SLMP-I, SLMP-II & the New RLLP. The adoption and practices of climate smart agricultural practices is higher in both SLMP-I and II; This is because CSA practices require some time to understand, comprehend, absorb, assimilate and adopt. Therefore, the adoption of CSA practices is expected to increase among watersheds that belong to the New RLLP as time goes on. Within the phases, Mulching and other agronomic practices such as Promotion of tree-planting, promotion of crop rotation, promotion of legume intercropping, ensuring access to drought and disease resistant crops, promoting of integrated pest and disease management, promoting post-harvest management, provision of line plants, supply of tillage and harvesting equipment are the most commonly adopted CSA practices.

Table 11: Adoption of CSA practices according RLLP phases

CSA practices adopted		Project phases									Total	
		SLMP-I			SLMP-II			New RLLP				
		Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %	Count	percent
Mulching	No	511	44.1	36.6	474	40.9	28.7	174	15	49.4	1159	34.1
	Yes	887	39.5	63.4	1178	52.5	71.3	178	7.9	50.6	2243	65.9
Improved tillage	No	650	40.5	46.5	838	52.2	50.7	118	7.3	33.5	1606	47.2
	Yes	748	41.6	53.5	814	45.3	49.3	234	13	66.5	1796	52.8
Water harvesting through cut off drains	No	887	41.3	63.4	1068	49.7	64.6	195	9.1	55.4	2150	63.2
	Yes	511	40.8	36.6	584	46.6	35.4	157	12.5	44.6	1252	36.8
Road water harvesting	No	1010	39.9	72.2	1271	50.2	76.9	253	10	71.9	2534	74.5
	Yes	388	44.7	27.8	381	43.9	23.1	99	11.4	28.1	868	25.5
Provision of improved farm tools	No	1015	40	72.6	1285	50.7	77.8	235	9.3	66.8	2535	74.5

(Machinery for tillage)	Yes	383	44.2	27.4	367	42.3	22.2	117	13.5	33.2	867	25.5
Improved composite making	No	806	38.9	57.7	1038	50.1	62.8	226	10.9	64.2	2070	60.8
	Yes	592	44.4	42.3	614	46.1	37.2	126	9.5	35.8	1332	39.2
Bio slurry	No	1301	41	93.1	1531	48.2	92.7	343	10.8	97.4	3175	93.3
	Yes	97	42.7	6.9	121	53.3	7.3	9	4	2.6	227	6.7
Vermicomposting and manure management	No	992	37.8	71	1332	50.8	80.6	300	11.4	85.2	2624	77.1
	Yes	406	52.2	29	320	41.1	19.4	52	6.7	14.8	778	22.9
Lime and Gypsum application for acidic and alkaline soils	No	1260	41.1	90.1	1477	48.1	89.4	331	10.8	94	3068	90.2
	Yes	138	41.3	9.9	175	52.4	10.6	21	6.3	6	334	9.8
Promotion of tree-planting	No	783	42.9	56	872	47.8	52.8	169	9.3	48	1824	53.6
	Yes	615	39	44	780	49.4	47.2	183	11.6	52	1578	46.4
Promotion of crop rotation	No	728	43.6	52.1	784	47	47.5	156	9.4	44.3	1668	49.0
	Yes	670	38.6	47.9	868	50.1	52.5	196	11.3	55.7	1734	51.0
Promotion of legume intercropping	No	1135	41.3	81.2	1309	47.7	79.2	302	11	85.8	2746	80.7
	Yes	263	40.1	18.8	343	52.3	20.8	50	7.6	14.2	656	19.3
Access to drought and disease resistant crops	No	1163	41	83.2	1391	49	84.2	282	9.9	80.1	2836	83.4
	Yes	235	41.5	16.8	261	46.1	15.8	70	12.4	19.9	566	16.6
Promoting of integrated pest and disease management	No	1166	41.2	83.4	1378	48.7	83.4	288	10.2	81.8	2832	83.2
	Yes	232	40.7	16.6	274	48.1	16.6	64	11.2	18.2	570	16.8
Promoting post-harvest management	No	1164	41.7	83.3	1319	47.2	79.8	310	11.1	88.1	2793	82.1
	Yes	234	38.4	16.7	333	54.7	20.2	42	6.9	11.9	609	17.9
Raw/Line planting	No	1104	43.3	79	1227	48.1	74.3	219	8.6	62.2	2550	75.0
	Yes	294	34.5	21	425	49.9	25.7	133	15.6	37.8	852	25.0

Source: 2021 RLLP beneficiary household questionnaire.

3.5.5 Adoption of CSA practices according to the different agroecological zones.

The rate of adoption of CSA practices is high among watersheds in Weyena Dega and Dega compared to upper kola. Within Weyena Dega, promotion of legume intercropping, integrated pest and disease management and Row planting are the most commonly adopted CSA practices; mulching, improved tillage, road water harvesting are among the most commonly adopted CSA practices in Dega. The table below describes in detail the rate of adoption of CSA practices within and across the different agroecological zones.

Table 12: Adoption of CSA practices across the agroecological zones

CSA practices		Agro-ecological zone of the watershed									Total	
		Dega			Upper Kolla,			Weyena Dega				
		Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %	Count	percent
Mulching	No	460	39.7	31.7	76	6.6	32.2	623	53.8	36.4	1159	34.1
	Yes	993	44.3	68.3	160	7.1	67.8	1090	48.6	63.6	2243	65.9
Improved tillage	No	676	42.1	46.5	122	7.6	51.7	808	50.3	47.2	1606	47.2
	Yes	777	43.3	53.5	114	6.3	48.3	905	50.4	52.8	1796	52.8
Water harvesting through cut off drains	No	921	42.8	63.4	142	6.6	60.2	1087	50.6	63.5	2150	63.2
	Yes	532	42.5	36.6	94	7.5	39.8	626	50	36.5	1252	36.8
Road water harvesting	No	1039	41	71.5	173	6.8	73.3	1322	52.2	77.2	2534	74.5
	Yes	414	47.7	28.5	63	7.3	26.7	391	45	22.8	868	25.5
Provision of improved farm tools (Machinery for tillage)	No	1076	42.4	74.1	186	7.3	78.8	1273	50.2	74.3	2535	74.5
	Yes	377	43.5	25.9	50	5.8	21.2	440	50.7	25.7	867	25.5
Improved composite making	No	801	38.7	55.1	187	9	79.2	1082	52.3	63.2	2070	60.8
	Yes	652	48.9	44.9	49	3.7	20.8	631	47.4	36.8	1332	39.2
Bio slurry	No	1353	42.6	93.1	228	7.2	96.6	1594	50.2	93.1	3175	93.3
	Yes	100	44.1	6.9	8	3.5	3.4	119	52.4	6.9	227	6.7
Vermicomposting and manure management	No	1091	41.6	75.1	209	8	88.6	1324	50.5	77.3	2624	77.1
	Yes	362	46.5	24.9	27	3.5	11.4	389	50	22.7	778	22.9

Lime and Gypsum application for acidic and alkaline soils	No	1291	42.1	88.9	222	7.2	94.1	1555	50.7	90.8	3068	90.2
	Yes	162	48.5	11.1	14	4.2	5.9	158	47.3	9.2	334	9.8
Promotion of tree-planting	No	737	40.4	50.7	165	9	69.9	922	50.5	53.8	1824	53.6
	Yes	716	45.4	49.3	71	4.5	30.1	791	50.1	46.2	1578	46.4
Promotion of crop rotation	No	655	39.3	45.1	166	10	70.3	847	50.8	49.4	1668	49.0
	Yes	798	46	54.9	70	4	29.7	866	49.9	50.6	1734	51.0
Promotion of legume intercropping	No	1155	42.1	79.5	208	7.6	88.1	1383	50.4	80.7	2746	80.7
	Yes	298	45.4	20.5	28	4.3	11.9	330	50.3	19.3	656	19.3
Ensuring access to drought and disease resistant crops	No	1220	43	84	224	7.9	94.9	1392	49.1	81.3	2836	83.4
	Yes	233	41.2	16	12	2.1	5.1	321	56.7	18.7	566	16.6
Promoting of integrated pest and disease management	No	1174	41.5	80.8	222	7.8	94.1	1436	50.7	83.8	2832	83.2
	Yes	279	48.9	19.2	14	2.5	5.9	277	48.6	16.2	570	16.8
Promoting post-harvest management	No	1136	40.7	78.2	213	7.6	90.3	1444	51.7	84.3	2793	82.1
	Yes	317	52.1	21.8	23	3.8	9.7	269	44.2	15.7	609	17.9
Raw/Line planting	No	1106	43.4	76.1	206	8.1	87.3	1238	48.5	72.3	2550	75.0
	Yes	347	40.7	23.9	30	3.5	12.7	475	55.8	27.7	852	25.0

Source: 2021 RLLP beneficiary household questionnaire.

3.5.6 Adoption of CSA practices

In both male and female headed households; mulching and improved tillage are the most commonly adopted climate smart agricultural practices; these are followed by tree-planting, crop rotation, legume intercropping, drought and disease resistant crops, integrated pest and disease management and row planting. Table below describes the adoption of CSA practices.

Table 13: Household adoption of CSA practices

CSA practices		Category of household							
		Female headed household			Male headed household			Total	
		Count	Row N %	Column N %	Count	Row N %	Column N %	Count	percent
Mulching	No	332	28.6	34.1	827	71.4	34	1159	34.1
	Yes	641	28.6	65.9	1602	71.4	66	2243	65.9
Improved tillage	No	487	30.3	50.1	1119	69.7	46.1	1606	47.2
	Yes	486	27.1	49.9	1310	72.9	53.9	1796	52.8
Water harvesting through cut off drains	No	581	27	59.7	1569	73	64.6	2150	63.2
	Yes	392	31.3	40.3	860	68.7	35.4	1252	36.8
Road water harvesting	No	713	28.1	73.3	1821	71.9	75	2534	74.5
	Yes	260	30	26.7	608	70	25	868	25.5
Provision of improved farm tools (Machinery for tillage)	No	704	27.8	72.4	1831	72.2	75.4	2535	74.5
	Yes	269	31	27.6	598	69	24.6	867	25.5
Improved composite making	No	589	28.5	60.5	1481	71.5	61	2070	60.8
	Yes	384	28.8	39.5	948	71.2	39	1332	39.2
Bio slurry	No	910	28.7	93.5	2265	71.3	93.2	3175	93.3
	Yes	63	27.8	6.5	164	72.2	6.8	227	6.7
Vermicomposting and manure management	No	736	28	75.6	1888	72	77.7	2624	77.1
	Yes	237	30.5	24.4	541	69.5	22.3	778	22.9
Lime and Gypsum application for acidic and alkaline soils	No	851	27.7	87.5	2217	72.3	91.3	3068	90.2
	Yes	122	36.5	12.5	212	63.5	8.7	334	9.8
Promotion of tree-planting	No	534	29.3	54.9	1290	70.7	53.1	1824	53.6
	Yes	439	27.8	45.1	1139	72.2	46.9	1578	46.4
Promotion of crop rotation	No	472	28.3	48.5	1196	71.7	49.2	1668	49.0
	Yes	501	28.9	51.5	1233	71.1	50.8	1734	51.0
Promotion of legume intercropping	No	791	28.8	81.3	1955	71.2	80.5	2746	80.7
	Yes	182	27.7	18.7	474	72.3	19.5	656	19.3
Ensuring access to drought and disease resistant crops	No	799	28.2	82.1	2037	71.8	83.9	2836	83.4
	Yes	174	30.7	17.9	392	69.3	16.1	566	16.6
Promoting of integrated pest and	No	794	28	81.6	2038	72	83.9	2832	83.2

disease management	Yes	179	31.4	18.4	391	68.6	16.1	570	16.8
Promoting post-harvest management	No	803	28.8	82.5	1990	71.2	81.9	2793	82.1
	Yes	170	27.9	17.5	439	72.1	18.1	609	17.9
Raw/Line planting	No	746	29.3	76.7	1804	70.7	74.3	2550	75.0
	Yes	227	26.6	23.3	625	73.4	25.7	852	25.0

Source: 2021 RLLP beneficiary household questionnaire.

3.5.6.1 Land and crop productivity.

A number of farmers practicing the growing of different crops on the farmlands. Households who adopted SWC technologies reported an average increase in produce after the adoption of SWC technologies. For example, there was an average increase in maize produce from 2381kg to 4340kg, an average increase in barley produce from 1663kg to 2400kg among other crops a shown in tables below and for more crops.

Table 14: Average yield before the adoption

Statistics	Average yield before the adoption						
	maize	Wheat	Barley	Millet	Sorghum	Beans	Peas
Average	2381	1663	1354	172	389	1250	337
Minimum	50	100	25	100	100	100	50
Maximum	4500	3500	2500	1200	2000	900	950

Source: 2021 RLLP beneficiary household questionnaire

Table 15: Average yield after the adoption

Statistics	Average yield after the adoption						
	maize	Wheat	Barley	Millet	Sorghum	Beans	Peas
Average	4340	4090	2400	385	3950	380	539
Minimum	200	300	200	100	300	300	150
Maximum	8000	6500	3600	2400	5000	4600	1200

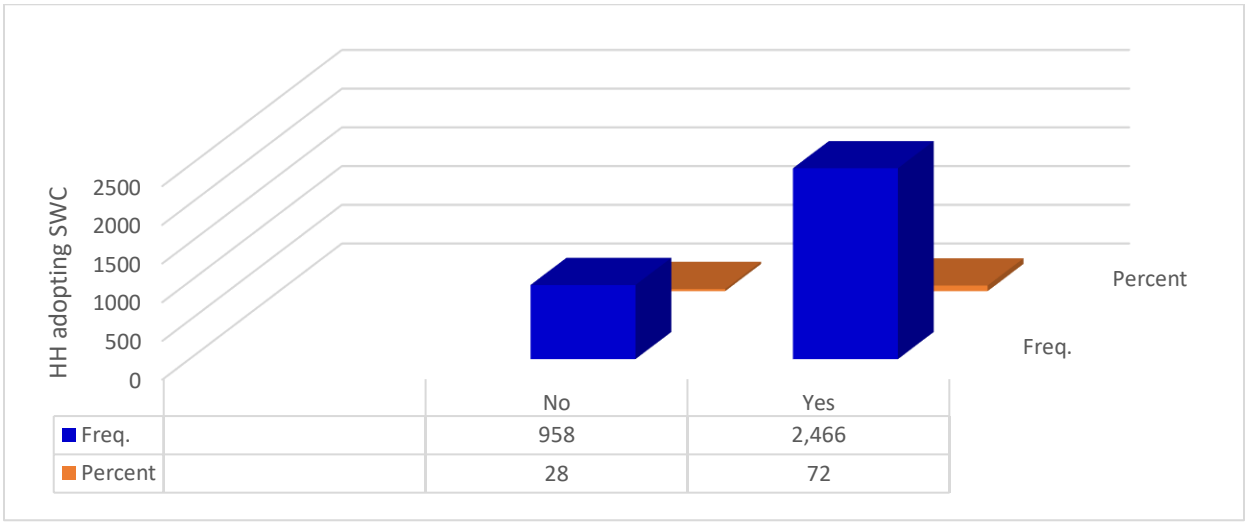
Source: 2021 RLLP beneficiary household questionnaire

3.5.6.2 Households that experienced an increase in crop productivity

Out of the 3425 households that adopted the different kinds of technologies (SWC, ISFM and CSA practices) 64.9% experienced an increase in crop productivity. The increase in crop productivity was determined by obtaining the ratio of the output per unit hectare of land that was used to produce crops. The figure below describes the number and percentage of households whose productivity increased as a result of adopting SWC technologies.

$$\text{HHs who experienced increase in crop productivity} = \frac{2466}{3794} \times 100 = 64.9\%$$

Figure 2: Increase in crop production and productivity



		No	Yes
Freq.		958	2,466
Percent		28	72

Source: RLLP beneficiary household questionnaire

The photographs of both crop and livestock production in Benshangul region

3.5.6.3 Changes in crop productivity after RLLP

The survey further examined the most common crops grown in each region; and assessed the level of output before and after the implementation of RLLP. The survey findings indicate that maize, wheat, Teff, Barley, Millet, sorghum beans are among the most common crops grown in all the six (6) regions that were visited during the survey. The output of each crop was analyzed in relation with the size of land allocated to each crop to determine productivity. The table below summarizes the levels of crop productivity before the permeation of RLLP

Table 16: Descriptive statistics (Quantitative yield data) before the project implementation

Statistic	yield of maize(kg)/ha	yield of wheat (Kgs)/ha	yield of barley (Kgs)	yield of millet (Kgs)/ha	yield of sorghum (Kgs)/ha	yield of beans (Kgs) /ha	yield of peas (Kgs)/ha
No. of observations	3794	3794	3794	3794	3794	3794	3794
Minimum	50.0	100.0	25.0	100.0	100.0	100.0	50.0
Maximum	4500.0	3500.0	2500.0	1200.0	2000.0	900.0	950.0
Freq. of minimum	72	102	1	14	39	268	59
Freq. of maximum	4	3	1	1	4	7	7
Range	4450.0	3400.0	2475.0	1100.0	1900.0	800.0	900.0
1st Quartile	200.0	200.0	200.0	182.5	200.0	150.0	100.0
Median	400.0	400.0	300.0	300.0	350.0	200.0	150.0
3rd Quartile	700.0	800.0	500.0	542.5	600.0	300.0	250.0
Mean	**600.2**	**640.3**	**409.1**	**392.7**	**458.2**	**245.6**	**213.8**
Standard deviation (n-1)	654.5	630.5	310.5	281.9	360.9	155.2	204.1
Standard error of the mean	13.4	15.5	8.5	21.5	18.3	4.4	9.7

Source: 2021 RLLP beneficiary household questionnaire.

The table below describes the productivity of the most common crops in the sex regions after the implementation of RLLP

Table 17: Descriptive statistics (Quantitative yield data) after the project implementation

Statistic	maize(kg)/ha	Wheat (kg)/ha	Barley (kg)/ha	millet (kg)/ha	Sorghum (kg)/ha	Beans (kg)/ha	Peas (kg)/ha
No. of observations	3794	3794	3794	3794	3794	3794	3794
Sum of weights	2381	1663	1354	172	389	1251	437
Minimum	20.0	300.0	200.0	100.0	300.0	300.0	150.0
Maximum	8000.0	6500.0	3600.0	2400.0	5000.0	4600.0	1200.0
Freq. of minimum	1	182	62	2	26	28	60
Freq. of maximum	1	1	1	1	2	1	10
Range	7980.0	6200.0	3400.0	2300.0	4700.0	4300.0	1050.0
1st Quartile	400.0	400.0	350.0	300.0	450.0	500.0	180.0
Median	700.0	700.0	500.0	600.0	700.0	600.0	250.0
3rd Quartile	1200.0	1200.0	800.0	1200.0	1000.0	700.0	400.0
Mean	**1034.6**	**1050.2**	**649.2**	**778.3**	**853.3**	**625.6**	**353.3**

Standard deviation (n-1)	987.3	977.6	480.4	545.1	597.409	217.6	264.3
Standard error of the mean	20.2	23.9	13.1	41.6	30.290	6.2	12.6

Source: 2021 RLLP beneficiary household questionnaire.

Analyzing the two descriptive tables (Table 12 and Table 13), it is clearly evident that there has been an increase in crop productivity after the implementation of RLLP. The survey went ahead to examine the significance of the difference in productivity using a paired sample test statistic. The findings of the test reveal a significant difference between productivity before and after the implementation of RLLP. The table illustrates the paired sampled test

Table 18: productivity comparison before and after RLLP for selected crops

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Maize(kg) before RLLP interventions - Maize(kg) after the RLLP interventions	434.423	719.994	14.755	405.489	463.358	29.442	2380	.000***
Pair 2	Wheat (Kgs) before the RLLP interventions - Wheat (kg) after the RLLP interventions	409.930	575.167	14.104	382.266	437.593	29.064	1662	.000***
Pair 3	Barley (Kgs) before the RLLP interventions - Barley (kg) after the RLLP interventions	240.120	226.834	6.165	228.027	252.213	38.952	1353	.000***
Pair 4	Millet (Kgs) before the RLLP interventions - Millet (kg) after the RLLP interventions	385.552	377.270	28.767	328.769	442.336	13.403	171	.000***
Pair 5	Sorghum (Kgs) before the RLLP interventions - Sorghum (kg) after the RLLP interventions	395.057	478.847	24.279	347.323	442.790	16.272	388	.000***
Pair 6	Beans (Kgs) before the RLLP interventions - Beans (kg) after the RLLP interventions	380.298	210.278	5.948	368.630	391.967	63.942	1249	.000***
Pair 7	Peas (Kgs) before the RLLP interventions - Peas (kg) after the RLLP interventions	139.497	118.167	5.653	128.387	150.606	24.678	436	.000***
Pair 8	Soya bean (Kgs) before the RLLP interventions - Soya bean(kg) after the RLLP interventions	125.174	218.066	20.335	84.891	165.457	6.156	114	.000***
Pair 9	green vegetables (Kgs) before the RLLP interventions - Green vegetables (kg) after the RLLP interventions	28.514	29.753	2.824	22.917	34.110	10.097	110	.000***
Pair 10	Cabbage (Kgs) before the RLLP interventions - Carrots (kg) after the RLLP interventions	41.178	91.759	6.287	28.785	53.572	6.550	212	.000***
Pair 11	carrots (Kgs) before the RLLP interventions - Chilli (kg) after the RLLP interventions	132.000	240.199	62.019	1.018	265.018	2.128	14	.052*

Pair 12	Chilli (paper) (Kgs) before the RLLP interventions - Chilli (kg) after the RLLP interventions	155.209	202.543	18.887	117.793	192.624	8.218	114	.000***
Pair 13	onions (Kgs) before the RLLP interventions - Tomatoes (kg) after the RLLP interventions	2.879	314.563	54.758	108.660	114.418	.053	32	.958
Pair 14	Teff (kg) after the RLLP interventions - Average yield of Teff (Kgs) before the RLLP interventions	203.659	201.632	5.277	193.308	214.010	38.594	1459	.000***

'* and ***' indicating significance at 10 and 1 percent probability level of significance

The findings of the household questionnaire are heavily supported by the findings of KIIs, FGDs and Case studies which all indicate an improvement in production and productivity (refer to section 3.4.14.9 of this report). **Biomass production** has also improved as equally as grain yield which positively influenced mulching in practicing CSA and further improved the productivity of yield and yield components. The increase in crop production is believed to increase soil fertility and eventually increase output per unit hectare of land. This because **biomass** is used as an input for organic compost making, for surface coverage as mulching or any other usage which positively contributes to the inherent soil fertility status. On the other hand, the higher the biomass volume higher the likelihood a farmer can produce sufficient organic input such as vermin compost and bacterial compost which again determines the rate of organic matter accumulation & soil fertility improvement rate. Likewise, the faster soil carbon sequestration, speed up of ecological restoration & resilience. (*Findings of KIIs with Agricultural officers and natural resource management experts in the different Woreda that were visited.)*

3.5.6.4 Area of land under SLMP as reported by beneficiaries

The survey examined the size of land that households/respondents have allocated to the different interventions that are directly in control of the household head. These include land allocated to crop production (on-farm income generating activities) off-farm and nonfarm, as well as the adoption of the different kinds of technologies. The findings of the survey show that the 3710 households are using a total of 4798.35 hectares of land for RLLP project related activities. Majority of households (32%) use between 1.0-1.50 hectares of land for RLLP project related activities;

Table 19: Size of land (Ha) allocated to RLLP activities by Households

Land size (Ha) of households	Frequency	Percent	Valid Percent	Cumulative Percent
.01-.5	828	21.8	22.3	22.3
.51-1.00	750	19.8	20.2	42.5
1.01-1.50	1188	31.3	32.0	74.6
1.51-2.00	250	6.6	6.7	81.3
2.01-8.25	694	18.3	18.7	100.0
Total	3710	97.8	100.0	

Source: 2021 RLLP beneficiary household questionnaire.

3.5.7 The contribution of adopting forest development activities.

A number of forests of development activities such as woodlots, community forest management and bamboo development to generate better income option to the livelihood were adopted by the different RLLP project beneficiaries. The adoption of forest development activities has had a number of benefits to the different communities which include but not limited to Diversified livelihood sources through bamboo selling; Reduced erosion; Contributed to organic manure through shading & decomposing of leaves; Contributed to increased vegetative cover; Increased the amount of rainfall through evapotranspiration. The sections and statistics below describe how beneficiaries reported about the contributions of adopting forest development activities.

3.5.7.1 Contribution of forest cover disaggregated by region.

The table below illustrates how beneficiaries reported about the contribution of adopting forest cover within and across the regions.

Table 20: contribution of adopting forest cover activities disaggregated by region

Contribution of the adoption of forest cover activities		Region of the respondent																		Total	
		Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR				
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Percent
livelihood diversification	No	588	52.1	55.1	53	4.7	18.8	50	4.43	49.5	170	15.1	32.9	150	52.1	55.1	118	10.5	36.9	1129	44.1
	Yes	479	33.5	44.9	229	16	81.2	51	3.57	50.5	347	24.3	67.1	122	8.5	44.9	202	14.1	63.1	1430	55.9
Reduced soil erosion	No	58	16.5	5.4	60	17.1	21.3	20	5.7	19.8	174	49.6	33.7	20	5.7	7.4	19	5.4	5.9	351	13.7
	Yes	1009	45.7	94.6	222	10.1	78.7	81	3.67	80.2	343	15.5	66.3	252	11.4	92.6	301	13.6	94.1	2208	86.3
Organic manure	No	433	43.6	40.6	100	10.1	35.5	66	6.65	65.3	125	12.6	24.2	120	12.1	44.1	148	14.9	46.3	992	38.8
	Yes	634	40.5	59.4	182	11.6	64.5	35	2.23	34.7	392	25	75.8	152	9.7	55.9	172	11	53.8	1567	61.2
Increased vegetative cover	No	483	43.9	45.3	183	16.7	64.9	49	4.46	48.5	220	20	42.6	15	1.4	5.5	149	13.6	46.6	1099	42.9
	Yes	584	40	54.7	99	6.8	35.1	52	3.56	51.5	297	20.3	57.4	257	17.6	94.5	171	11.7	53.4	1460	57.1

Source: RLLP beneficiary household questionnaire

3.5.7.2 Contribution of the adoption of forest cover by phases

Note that RLLP comprises of watersheds in SLMP-I, SLMP-II & the New RLLP. The most commonly reported contribution of forest cover among the three phases of the sustainable land management program are: reduced soil erosion, contribution to organic manure through shading and decomposing of leaves and contribution to increased vegetative cover in the areas. In SLMP-II diversification of livelihood sources through bamboo harvesting and selling is highly reported compared to other two phases (SLMP-I & New RLLP)

Table 21: Contribution of forest cover as reported across the different phases of the program

Contributions of forest covers		Project phases									Total	
		SLMP-I			SLMP-II			New RLLP				
		Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Percent
livelihood diversification	No	445	45.5	42.7	508	51.9	45	26	2.7	22.8	1129	44.1
	Yes	598	45.7	57.3	622	47.6	55	88	6.7	77.2	1430	55.9
Reduced soil erosion	No	130	39.3	12.5	158	47.7	14	43	13	37.7	351	13.7
	Yes	913	46.7	87.5	972	49.7	86	71	3.6	62.3	2208	86.3
Organic manure	No	392	45	37.6	430	49.3	38.1	50	5.7	43.9	992	38.8
	Yes	651	46	62.4	700	49.5	61.9	64	4.5	56.1	1567	61.2
Increased vegetative cover	No	513	47.3	49.2	501	46.2	44.3	70	6.5	61.4	1099	42.9
	Yes	530	44.1	50.8	629	52.3	55.7	44	3.7	38.6	1460	57.1
Increased amount of rainfall	No	637	44.9	61.1	705	49.7	62.4	77	5.4	67.5	1419	62.0
	Yes	406	46.8	38.9	425	49	37.6	37	4.3	32.5	868	38.0

Source: RLLP beneficiary household questionnaire

3.5.7.3 Contribution of forest cover disaggregated by AEZ.

The findings of the study indicate that the benefits of the adoption of the different forest cover activities were more experienced in Weyena Dega, followed by Dega and upper Koller. Weyena Dega represents 50.4%; Dega represents 43.4% while Upper koller represents 6.2%. the table below represents the number and percentage of respondents who reported about the benefits of adopting forest cover in each Agroecological zone.

Table 22: Contribution of forest cover activities based on the AEZ

Contribution of the adoption of forest cover activities		Agro-ecological zone of the watershed									Total	
		Dega			Upper Kolla			Weyena Dega				
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Percent
livelihood diversification	No	424	43.3	47.1	80	8.2	27.2	475	48.5	43.5	1129	44.1
	Yes	476	36.4	52.9	214	16.4	72.8	618	47.2	56.5	1430	55.9
Reduced soil erosion	No	127	38.4	14.1	65	19.6	22.1	139	42	12.7	351	13.7
	Yes	773	39.5	85.9	229	11.7	77.9	954	48.8	87.3	2208	86.3
Organic manure	No	324	37.2	36	134	15.4	45.6	414	47.5	37.9	992	38.8

	Yes	576	40.7	64	160	11.3	54.4	679	48	62.1	1567	61.2
Increased vegetative cover	No	406	37.5	45.1	168	15.5	57.1	510	47	46.7	1099	42.9
	Yes	494	41.1	54.9	126	10.5	42.9	583	48.5	53.3	1460	57.1
Increased amount of rainfall	No	518	36.5	57.6	230	16.2	78.2	671	47.3	61.4	1419	62.0
	Yes	382	44	42.4	64	7.4	21.8	422	48.6	38.6	868	38.0

Source: RLLP beneficiary household questionnaire

3.5.7.4 Benefits of forest cover as reported by the gender (sex) of the household head

The adoption of forest cover activities and eventually its contribution is more felt by the male headed households compared the female headed household. This is illustrated by the table below.

Table 23: contribution of forest covers as reported by the types of households

Contribution of the adoption of forest cover activities		Category of household							
		Female headed household			Male headed household			Total	
		Count	Row %	Col %	Count	Row %	Col %	Count	Percent
livelihood diversification	No	339	34.6	44.4	640	65.4	42	1129	44.1
	Yes	424	32.4	55.6	884	67.6	58	1430	55.9
Reduced soil erosion	No	142	42.9	18.6	189	57.1	12.4	351	13.7
	Yes	621	31.7	81.4	1335	68.3	87.6	2208	86.3
Organic manure	No	298	34.2	39.1	574	65.8	37.7	992	38.8
	Yes	465	32.9	60.9	950	67.1	62.3	1567	61.2
Increased vegetative cover	No	365	33.7	47.8	719	66.3	47.2	1099	42.9
	Yes	398	33.1	52.2	805	66.9	52.8	1460	57.1

Source: RLLP beneficiary household questionnaire

Improved quality and color of water in Mirab Azernet

3.5.8 The contributions of water harvesting structures

A number of waters harvesting structures were promoted by the project. The structures include but not limited to community ponds, hand dug wells among others. This section presents the contribution of the above structures in improving livelihood incomes.

3.5.8.1 Contribution of the water harvesting structures at a regional level

Study participants in each of the regions reported about the contribution of water harvesting infrastructures. Among the contributions of the water harvesting infrastructures that were reported are Improved crop productivity, reduced floods, reduced soil erosion, improved the quality (color) of water in the different water bodies, increased food security, increased volume of sales for crop produce, increased incomes, improved & diversified livelihood. The table below illustrates how respondents reported about the contribution of the water harvesting structures in each of the region in terms of percentage and counts

Table 24: Contribution of water harvesting structures per region

The contribution of water harvesting structures		Region of the respondent																		Total	
		Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR				
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	count	percent
Increased crop productivity	No	117	27	11	52	12	18.4	21	4.8	20.8	123	28.3	23.8	50	27	18.4	71	16.4	22.2	434	17.0
	Yes	950	44.7	89	230	10.8	81.6	80	3.8	79.2	393	18.5	76.2	222	10.5	81.6	249	11.7	77.8	2124	83.0
Reduced floods	No	160	23.6	15	89	13.1	31.6	36	5.3	35.6	209	30.8	40.5	87	12.8	32	97	14.3	30.3	678	26.5
	Yes	907	48.1	85	193	10.2	68.4	65	3.4	64.4	307	16.3	59.5	190	10.1	69.9	223	11.8	69.7	1885	74.5
Reduced soil erosion	No	55	11.2	5.2	88	17.9	31.2	31	6.3	30.7	161	32.8	31.2	100	20.4	36.8	56	11.4	17.5	491	19.2
	Yes	1012	49	94.8	194	9.4	68.8	70	3.4	69.3	355	17.2	68.8	172	8.3	63.2	264	12.8	82.5	2067	79.8
Improved color of water	No	777	48.1	72.8	170	10.5	60.3	92	5.7	91.1	258	16	50	125	7.7	46	192	11.9	60	1614	63.1
	Yes	290	30.7	27.2	112	11.9	39.7	9	1	8.9	258	27.3	50	147	15.6	54	128	13.6	40	944	36.9
Increased food security	No	578	44.8	54.2	211	16.3	74.8	71	5.5	70.3	186	14.4	36	60	4.6	22.1	185	14.3	57.8	1291	52.5
	Yes	489	41.9	45.8	71	6.1	25.2	30	2.6	29.7	330	28.3	64	112	9.6	41.2	135	11.6	42.2	1167	47.5
Increased sales	No	641	46.8	60.1	222	16.2	78.7	70	5.1	69.3	214	15.6	41.5	72	5.3	26.5	152	11.1	47.5	1371	53.6
	Yes	426	35.9	39.9	60	5.1	21.3	31	2.6	30.7	302	25.4	58.5	200	16.8	73.5	168	14.2	52.5	1187	46.4
Increased incomes	No	504	39.9	47.2	242	19.2	85.8	54	4.3	53.5	228	18.1	44.2	82	6.5	30.1	153	12.1	47.8	1263	49.4
	Yes	563	43.5	52.8	40	3.1	14.2	47	3.6	46.5	288	22.2	55.8	190	14.7	69.9	167	12.9	52.2	1295	50.6
Livelihood diversification	No	726	42.2	68	262	15.2	92.9	74	4.3	73.3	360	20.9	69.8	76	4.4	27.9	223	13	69.7	1721	67.2
	Yes	341	40.6	32	20	2.4	7.1	27	3.2	26.7	156	18.6	30.2	198	23.6	72.8	97	11.6	30.3	839	32.8

Source: RLLP beneficiary household questionnaire

3.5.8.2 Contribution of the water harvesting structures disaggregated by the SLMP phases.

The contribution of water harvesting structures are more experienced among watersheds that were taken on in the second phase (SLMP-II) of the project, followed by the first phase (SLMP-I) compared to the new RLLP. Among the watersheds in SLMP-I, increased crop productivity (85.5%), reduced erosion (84.1%), reduced floods (76.6%) and increased food security are the most commonly reported contribution of farm water and moisture management practices; while in SLMP-II, Reduced erosion (83.3%), increased crop productivity (81.8%), increased volume of sales and incomes (54.6% & 53.9%) are the most commonly reported contributions of farm water and moisture management practices.

Table 25: The contribution of water harvesting structures analyzed at program phase level

The contribution of water harvesting structures		Project phases									Total	
		SLMP-I			SLMP-II			New RLLP				
		Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %	count	percent
Increased crop productivity	No	161	41.9	15.5	206	53.6	18.2	17	4.4	14.9	384	16.8
	Yes	881	46.3	84.5	924	48.6	81.8	97	5.1	85.1	1902	83.2
Reduced floods	No	244	41.3	23.4	311	52.6	27.5	36	6.1	31.6	591	25.9
	Yes	798	47.1	76.6	819	48.3	72.5	78	4.6	68.4	1695	74.1
Reduced soil erosion	No	166	42.5	15.9	189	48.3	16.7	36	9.2	31.6	391	17.1
	Yes	876	46.2	84.1	941	49.7	83.3	78	4.1	68.4	1895	82.9
Improved color of water	No	721	48.4	69.2	690	46.3	61.1	78	5.2	68.4	1489	65.1
	Yes	321	40.3	30.8	440	55.2	38.9	36	4.5	31.6	797	34.9
Increased food security	No	578	47	55.5	605	49.1	53.5	48	3.9	42.1	1231	53.8
	Yes	464	44	44.5	525	49.8	46.5	66	6.3	57.9	1055	46.2
Increased sales	No	617	47.5	59.2	617	47.5	54.6	65	5	57	1299	56.8
	Yes	425	43.1	40.8	513	52	45.4	49	5	43	987	43.2
Increased incomes	No	518	43.9	49.7	609	51.6	53.9	54	4.6	47.4	1181	51.7
	Yes	524	47.4	50.3	521	47.1	46.1	60	5.4	52.6	1105	48.3
Livelihood diversification	No	778	47.3	74.7	784	47.7	69.4	83	5	72.8	1645	72.0
	Yes	264	41.2	25.3	346	54	30.6	31	4.8	27.2	641	28.0

Source: RLLP beneficiary household questionnaire

3.5.8.3 Contribution of the water harvesting structures Across the AEZs.

The findings of the study indicate that the benefits of the adoption of the water harvesting structures were more experienced in Weyena Dega, followed by Dega and upper Koller. Weyena Dega represents 50.4%; Dega represents 43.4% while Upper koller represents 6.2%. the table below represents the number and percentage of respondents who reported about the benefits of adopting forest cover in each Agroecological zone.

Table 26: Contribution of water harvesting structures based on the AEZ

Contribution of water harvesting structures		Agro-ecological zone of the watershed										
		Dega			Upper Kolla			Weyena Dega			Total	
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	count	percent
Increased crop productivity	No	143	37.2	15.9	55	14.3	18.7	186	48.4	17	384	16.8
	Yes	756	39.7	84.1	239	12.6	81.3	907	47.7	83	1902	83.2
Reduced floods	No	200	33.8	22.2	98	16.6	33.3	293	49.6	26.8	591	25.9
	Yes	699	41.2	77.8	196	11.6	66.7	800	47.2	73.2	1695	74.1
Reduced soil erosion	No	103	26.3	11.5	93	23.8	31.6	195	49.9	17.8	391	17.1
	Yes	796	42	88.5	201	10.6	68.4	898	47.4	82.2	1895	82.9
Improved color of water	No	563	37.8	62.6	213	14.3	72.4	713	47.9	65.2	1489	65.1
	Yes	336	42.2	37.4	81	10.2	27.6	380	47.7	34.8	797	34.9
Increased food security	No	448	36.4	49.8	217	17.6	73.8	566	46	51.8	1231	53.8
	Yes	451	42.7	50.2	77	7.3	26.2	527	50	48.2	1055	46.2
Increased sales	No	504	38.8	56.1	219	16.9	74.5	576	44.3	52.7	1299	56.8
	Yes	395	40	43.9	75	7.6	25.5	517	52.4	47.3	987	43.2
Increased incomes	No	436	36.9	48.5	222	18.8	75.5	523	44.3	47.8	1181	51.7
	Yes	463	41.9	51.5	72	6.5	24.5	570	51.6	52.2	1105	48.3
Livelihood diversification	No	621	37.8	69.1	254	15.4	86.4	770	46.8	70.4	1645	72.0
	Yes	278	43.4	30.9	40	6.2	13.6	323	50.4	29.6	641	28.0

Source: RLLP beneficiary household questionnaire

3.5.8.4 Contribution of water harvesting structures based on the gender (sex) of the household head

The adoption of forest cover activities and eventually its contribution is more felt by the male headed households compared the female headed household. This is illustrated by the fact that at least 60% of all the respondents from the male headed households reported about each of the contribution of the reported.

Table 27: Contribution of water harvesting structures disaggregated sex of the household head

Contribution of water harvesting structures		Category of household							
		Female headed household			Male headed household			Total	
		Count	Row %	Col %	Count	Row %	Col %	count	percent
Increased crop productivity	No	145	37.8	19	239	62.2	15.7	384	16.8
	Yes	618	32.5	81	1284	67.5	84.3	1902	83.2

Reduced floods	No	213	36	27.9	378	64	24.8	591	25.9
	Yes	550	32.4	72.1	1145	67.6	75.2	1695	74.1
Reduced soil erosion	No	135	34.5	17.7	256	65.5	16.8	391	17.1
	Yes	628	33.1	82.3	1267	66.9	83.2	1895	82.9
Improved color of water	No	518	34.8	67.9	971	65.2	63.8	1489	65.1
	Yes	245	30.7	32.1	552	69.3	36.2	797	34.9
Increased food security	No	434	35.3	56.9	797	64.7	52.3	1231	53.8
	Yes	329	31.2	43.1	726	68.8	47.7	1055	46.2
Increased sales	No	454	34.9	59.5	845	65.1	55.5	1299	56.8
	Yes	309	31.3	40.5	678	68.7	44.5	987	43.2
Increased incomes	No	399	33.8	52.3	782	66.2	51.3	1181	51.7
	Yes	364	32.9	47.7	741	67.1	48.7	1105	48.3
Livelihood diversification	No	582	35.4	76.3	1063	64.6	69.8	1645	72.0
	Yes	181	28.2	23.7	460	71.8	30.2	641	28.0

Source: RLLP beneficiary household questionnaire

3.5.8.5 Contribution of water harvesting structures as reported by the type of beneficiaries

Despite the fact that sample size for direct beneficiaries was more than that of the indirect beneficiaries, water harvesting structures were reported by both direct and indirect beneficiaries. Among the direct beneficiaries, increased crop productivity (84.3%), reduced erosion (84.2%), are the most commonly reported contributions just like it is among the indirect beneficiaries although the rate of reporting such contributions is slightly lower-that is increased crop productivity (75.8%), reduced erosion (74.0%). The table below illustrates how both direct and indirect beneficiaries reported about the benefits of water harvesting structures.

Table 28: Benefits of water harvesting structures disaggregated by type of beneficiaries

Contribution of water harvesting structures		Category of beneficiary					
		Direct beneficiary			Indirect beneficiary		
		Count	Row %	Col %	Count	Row %	Col %
Increased crop productivity	No	314	81.8	15.7	70	18.2	24.2
	Yes	1683	88.5	84.3	219	11.5	75.8
Reduced floods	No	502	84.9	25.1	89	15.1	30.8
	Yes	1495	88.2	74.9	200	11.8	69.2
Reduced soil erosion	No	316	80.8	15.8	75	19.2	26.0
	Yes	1681	88.7	84.2	214	11.3	74.0
Improved color of water	No	1297	87.1	64.9	192	12.9	66.4
	Yes	700	87.8	35.1	97	12.2	33.6
Increased food security	No	1037	84.2	51.9	194	15.8	67.1
	Yes	960	91.0	48.1	95	9.0	32.9
Increased sales	No	1095	84.3	54.8	204	15.7	70.6
	Yes	902	91.4	45.2	85	8.6	29.4
Increased incomes	No	986	83.5	49.4	195	16.5	67.5
	Yes	1011	91.5	50.6	94	8.5	32.5
Livelihood diversification	No	1417	86.1	71.0	228	13.9	78.9
	Yes	580	90.5	29.0	61	9.5	21.1

Source: RLLP beneficiary household questionnaire

Biophysical constructions & water harvesting structures Gumay & in Hulberag

3.5.8.6 Adoption of water harvesting structures

The computations below indicate that 86891 households were found to have adopted water harvesting structures; and 16147 female headed households had adopted water harvesting structures as of July 2021

$$\text{HHs adopting water harvesting structures} = \frac{\text{Findings of the study}}{\text{Sample size for HH}} \times \text{July 2021 cumulative target}$$

$$\text{Households adopting ISFM technologies} = \frac{1902}{3794} \times 173{,}326$$

$$\text{Female headed households adopting water harvesting structures} = \frac{\text{Findings of the study}}{\text{Sample size for HH}} \times \text{July 2021 cumulative target}$$

$$\text{Female headed households adopting water harvesting structures} = \frac{618}{1130} \times 29526$$

3.5.9 Adoption of farm water and soil moisture management

A number of conservation agriculture permanent soil cover and road water harvesting technologies were encouraged and promoted by the RLLP project. The survey examined the adoption of farm water and soil moisture management practices by the individual farmers in CSA watersheds and the following results describe the adoption rate of farm water and soil moisture management practices.

$$\text{HHs adopting farm water \& soil moisture management technologies} = \frac{\text{Findings of the study}}{\text{Sample size for MHH}} \times \text{July 2021 cumulative target}$$

$$\text{Households adopting farm water \& soil moisture managemenpractices} = \frac{2024}{3794} \times 173{,}326$$

A total of 92465 households have adopted farm water and moisture management practice. This represents over 53% of the July 2021 cumulative targeted project beneficiaries.

$$\text{Female headed HHs adopting farm water \& soil moisture management technologies} = \frac{\text{Findings of the study}}{\text{Sample size for Female headed}} \times \text{July 2021 cumul target}$$

$$\text{Households adopting farm water \& soil moisture managemenpractices} = \frac{668}{1130} \times 22526$$

From the computation above, a total of 19148 were found to have adopted farm water and moisture management practices.

3.5.9.1 Adoption of farm water and soil moisture management technologies at a regional level.

A number of farm water and soil moisture management technologies were adopted in all the regions. The different kinds of Terraces however stood out and were adopted in all the regions where the project was implemented. This was followed by soil covers and cover cropping, road water harvesting, hand dug wells and making of points. The table below describes the adoption of farm water and moisture management practices in all the six regions that were visited during the RLLP beneficiary survey.

Table 29: Adoption of farm water and soil moisture management technologies across the regions

Farm water and soil moisture management technologies		Region of the respondent																	
		Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Terraces	No	7	1.9	0.7	52	14.3	18.4	35	9.6	34.7	137	37.7	26.5	100	27.55	36.76	32	8.8	10
	Yes	1060	48.3	99.3	230	10.5	81.6	66	3.0	65.3	380	17.3	73.5	172	7.83	63.24	288	13.1	90
Soil covers & cover cropping	No	102	16.0	9.6	108	16.9	38.3	25	3.9	24.8	172	27.0	33.3	98	15.36	36.03	133	20.8	41.6
	Yes	965	50.2	90.4	174	9.1	61.7	76	4.0	75.2	345	18.0	66.7	175	9.11	64.34	187	9.7	58.4
Road water harvesting	No	811	48.2	76	215	12.8	76.2	84	5.0	83.2	304	18.1	58.8	46	2.73	16.91	224	13.3	70
	Yes	256	29.3	24	67	7.7	23.8	17	1.9	16.8	213	24.3	41.2	226	25.83	83.09	96	11.0	30
Making of ponds	No	948	47.1	88.8	258	12.8	91.5	94	4.7	93.1	378	18.8	73.1	50	2.49	18.38	284	14.1	88.8
	Yes	119	21.8	11.2	24	4.4	8.5	7	1.3	6.9	139	25.4	26.9	222	40.59	81.62	36	6.6	11.3
Hand dug well	No	910	43.9	85.3	259	12.5	91.8	83	4.0	82.2	469	22.6	90.7	44	2.12	16.18	308	14.9	96.3
	Yes	157	32.3	14.7	23	4.7	8.2	18	3.7	17.8	48	9.9	9.3	228	46.91	83.82	12	2.5	3.8

Source: RLLP beneficiary household questionnaire

3.5.9.2 Adoption of Farm water and moisture management technologies disaggregated by Phases of the project.

The survey discovered that both across and within the phases, Terraces Soil covers and cover cropping technologies are the most commonly adopted farm water and moisture management technologies. The table describes the adoption of farm water and moisture management technologies within and across the different phases of the project

Table 30: Adoption of Farm water and moisture management technologies within and across the phases.

Farm water and soil moisture management technologies		Project phases								
		SLMP-I			SLMP-II			New RLLP		
		Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %
Terraces, minimum tillage, residue management, intercropping & rotation	No	80	30.4	7.7	167	63.5	14.8	16	6.1	14.0
	Yes	963	47.6	92.3	963	47.6	85.2	98	4.8	86.0
Soil covers & cover cropping	No	218	40.4	20.9	264	48.9	23.4	58	10.7	50.9
	Yes	825	47.2	79.1	866	49.6	76.6	56	3.2	49.1
Road water harvesting	No	730	44.6	70.0	821	50.1	72.7	87	5.3	76.3
	Yes	313	48.2	30.0	309	47.6	27.3	27	4.2	23.7
Making of ponds	No	895	45.6	85.8	966	49.2	85.5	101	5.1	88.6
	Yes	148	45.5	14.2	164	50.5	14.5	13	4.0	11.4
Hand dug wells	No	916	45.1	87.8	1004	49.5	88.8	109	5.4	95.6
	Yes	127	49.2	12.2	126	48.8	11.2	5	1.9	4.4

Source: RLLP beneficiary household questionnaire

3.5.9.3 Adoption of farm water and soil moisture management technologies in line with AEZ.

The findings of the study indicated that the adoption of farm water and soil moisture management technology were more adopted in the Weyena Dega and Dega agro-ecological zones as compared to Upper Kolla. The table below illustrates the adoption of the farm water and soil moisture management technologies.

Table 31: Farm water & soil moisture management technologies in line with AEZ

Farm water and soil moisture management technologies		Agro-ecological zone of the watershed								
		Dega			Upper Kolla			Weyena Dega		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Terraces minimum tillage, crop rotation	No	66	25.1	7.3	67	25.5	22.8	130	49.4	11.9
	Yes	834	41.2	92.7	227	11.2	77.2	963	47.6	88.1
Soil covers & cover cropping	No	139	25.7	15.4	96	17.8	32.7	305	56.5	27.9
	Yes	761	43.6	84.6	198	11.3	67.3	788	45.1	72.1
Road water harvesting	No	618	37.7	68.7	230	14.0	78.2	790	48.2	72.3
	Yes	282	43.5	31.3	64	9.9	21.8	303	46.7	27.7
Making of ponds	No	749	38.2	83.2	272	13.9	92.5	941	48.0	86.1
	Yes	151	46.5	16.8	22	6.8	7.5	152	46.8	13.9
Hand dug well	No	777	38.3	86.3	258	12.7	87.8	994	49.0	90.9
	Yes	123	47.7	13.7	36	14.0	12.2	99	38.4	9.1

Source: RLLP beneficiary household questionnaire

3.5.9.4 Adoption of farm water and soil moisture management technologies disaggregated by gender (sex) of household head.

The survey revealed discovered that the adoption of farm water and soil management technologies is evenly distributed with relatively no difference in the adoption rate. This was further supported by information from the qualitative data where female participants in FGDs emphasized the importance of adopting the farm water and soil management structures regardless of the gender of the household head as long as the technologies are expected to reduce vulnerability to climate shocks and increase productivity. The table below describes the adoption farm water and soil moisture management technologies disaggregated by the gender of the household head.

Table 32: adoption of farm water and soil moisture management technologies disaggregated by household head

Farm water and soil moisture management technologies		Category of household					
		Female headed household			Male headed household		
		Count	Row %	Col %	Count	Row %	Col %
Terraces, crop rotation	No	95	36.1	12.5	168	63.9	11.0
	Yes	668	33.0	87.5	1356	67.0	89.0
Soil covers & cover cropping	No	174	32.2	22.8	366	67.8	24.0
	Yes	589	33.7	77.2	1158	66.3	76.0
Road water harvesting	No	547	33.4	71.7	1091	66.6	71.6
	Yes	216	33.3	28.3	433	66.7	28.4
Making of ponds	No	653	33.3	85.6	1309	66.7	85.9
	Yes	110	33.8	14.4	215	66.2	14.1
Hand dug well	No	689	34.0	90.3	1340	66.0	87.9
	Yes	74	28.7	9.7	184	71.3	12.1

Source: RLLP beneficiary household questionnaire

3.5.9.5 Farm water and soil moisture management technologies disaggregated by type of beneficiaries

Both direct and indirect beneficiaries were found to have adopted Farm water and soil moisture management technologies on their farmlands. The table below describes the adoption of farm water and soil moisture management disaggregated by the type of beneficiaries (direct and indirect beneficiary)

Table 33: Adoption of farm water and soil moisture management technologies by type of beneficiaries

Farm water and soil moisture management technologies		What category of beneficiary are you					
		Direct beneficiary			Indirect beneficiary		
		Count	Row %	Col %	Count	Row %	Col %
Terraces	No	212	80.6	10.6	51	19.4	17.6
	Yes	1786	88.2	89.4	238	11.8	82.4

Soil covers & cover cropping	No	453	83.9	22.7	87	16.1	30.1
	Yes	1545	88.4	77.3	202	11.6	69.9
Road water harvesting	No	1424	86.9	71.3	214	13.1	74.0
	Yes	574	88.4	28.7	75	11.6	26.0
Making of ponds	No	1708	87.1	85.5	254	12.9	87.9
	Yes	290	89.2	14.5	35	10.8	12.1
Hand dug well	No	1762	86.8	88.2	267	13.2	92.4
	Yes	236	91.5	11.8	22	8.5	7.6

Source: RLLP beneficiary household questionnaire

Farm water management structures in Wonchi Oromia

3.5.10 The adoption of Integrated Soil Fertility Management (ISFM) technologies.

Various soil fertility management practices have been promoted by RLLP. These include improved compost making including bio-slurry, vermi-compost and manure management (including bio-digesters); lime and gypsum application for acidic and alkaline soils respectively; promotion of tree-crop-livestock systems (Agro-forestry practices); and crop rotation and legume intercropping. The findings below illustrate the rate of adoption of ISFM by the Individual farmers in CSA watersheds.

$$\text{HHs adopting ISFM technologies} = \frac{\text{Findings of the study}}{\text{Sample size for HH}} \times \text{July 2021 cumulative target}$$

$$\text{Households adopting ISFM technologies} = \frac{1746}{3794} \times 173{,}326$$

From the above computation, 79764 households were found to have adopted ISFM technologies. This represents 46% of the July 2021 cumulative target beneficiaries who are expected to have adopted ISFM technologies at the time.

$$\text{Female headed HHs adopting ISFM technologies} = \frac{\text{Findings of the study}}{\text{Sample size for HH}} \times \text{July 2021 cumulative target}$$

$$\text{Female headed Households adopting ISFM technologies} = \frac{567}{1130} \times 29{,}526$$

From the findings above the 16254 female headed households were found to have adopted integrated soil fertility management technologies on their farm land.

3.5.10.1 Adoption of the ISFM across the regions.

Across the regions, Improved compost making, Vermi-composting and organic manure management are common in all the six regions that participated in the study. Within the regions, organic manure management and improved compost making are taking the lead in the adoption of the IFM technologies. The table below describes the adoption of the ISFM technologies within and across the regions

Table 34: adoption of integrated soil fertility management technologies across the regions.

Integrated Soil Fertility Management (ISFM) technologies		Region of the respondent																	
		Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Improved compost making	No	201	34.0	18.8	77	13.0	27.3	25	4.2	24.8	123	20.8	23.8	50	8.5	18.4	115	19.5	35.9
	Yes	866	44.0	81.2	205	10.4	72.7	76	3.9	75.2	394	20.0	76.2	222	11.3	81.6	205	10.4	64.1
Bio-slurry	No	970	45.3	90.9	275	12.8	97.5	95	4.4	94.1	450	21.0	87	45	2.1	16.5	308	14.4	96.3
	Yes	97	23.3	9.1	7	1.7	2.5	6	1.4	5.9	67	16.1	13	227	54.6	83.5	12	2.9	3.8
Vermi-composting	No	599	38.1	56.1	247	15.7	87.6	76	4.8	75.2	300	19.1	58	65	4.1	23.9	287	18.2	89.7
	Yes	468	47.5	43.9	35	3.6	12.4	25	2.5	24.8	217	22.0	42	207	21.0	76.1	33	3.4	10.3
Use of a bio-digester	No	759	40.9	71.1	250	13.5	88.7	101	5.4	100	383	20.6	74.1	80	4.3	29.4	282	15.2	88.1
	Yes	308	43.8	28.9	32	4.5	11.3	0	0.0	0	134	19.0	25.9	192	27.3	70.6	38	5.4	11.9
Organic manure management	No	269	27.7	25.2	176	18.1	62.4	62	6.4	61.4	234	24.1	45.3	75	7.7	27.6	154	15.9	48.1
	Yes	798	50.2	74.8	106	6.7	37.6	39	2.5	38.6	283	17.8	54.7	197	12.4	72.4	166	10.4	51.9
Lime and gypsum application	No	1026	49.1	96.2	222	10.6	78.7	99	4.7	98	390	18.7	75.4	67	3.2	24.6	285	13.6	89.1
	Yes	41	8.7	3.8	60	12.8	21.3	2	0.4	2	127	27.0	24.6	205	43.6	75.4	35	7.4	10.9
Tree-crop livestock system	No	873	47.1	81.8	235	12.7	83.3	68	3.7	67.3	396	21.4	76.6	70	3.8	25.7	211	11.4	65.9

Yes	194	27.5	18.2	47	6.7	16.7	33	4.7	32.7	121	17.1	23.4	202	28.6	74.3	109	15.4	34.1

Source: 2021 RLLP beneficiary household questionnaire

3.5.10.2 Adoption of ISFM technologies disaggregated by phases

Across the regions, most of the integrated soil fertility management practices are adopted in watersheds under SLMP-II, followed by the watersheds in SLP-I. Within the Phases improved compost making, tree crop livestock systems and organic manure management are the ones with high rates of adoption. The table below describes the adoption of ISFM technologies within and across the different phases of the program

Table 35: Adoption of ISFM technologies within and across the phases

integrated soil fertility management technologies		Project phases								
		SLMP-I			SLMP-II			New RLLP		
		Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %
Improved compost	No	234	43.3	22.4	298	55.1	26.4	9	1.7	7.9
making	Yes	809	46.3	77.6	832	47.7	73.6	105	6.0	92.1
Bio-slurry	No	954	45.5	91.5	1040	49.6	92.0	104	5.0	91.2
	Yes	89	47.1	8.5	90	47.6	8.0	10	5.3	8.8%
Vermi-composting	No	600	39.8	57.5	823	54.5	72.8	86	5.7	75.4
	Yes	443	56.9	42.5	307	39.5	27.2	28	3.6	24.6
Use of a bio-digester	No	769	43.3	73.7	912	51.4	80.7	94	5.3	82.5
	Yes	274	53.5	26.3	218	42.6	19.3	20	3.9	17.5
Organic manure	No	369	41.2	35.4	466	52.1	41.2	60	6.7	52.6
management	Yes	674	48.4	64.6	664	47.7	58.8	54	3.9	47.4
Lime and gypsum	No	905	44.8	86.8	1011	50.0	89.5	106	5.2	93.0
application	Yes	138	52.1	13.2	119	44.9	10.5	8	3.0	7.0
Tree-crop livestock	No	834	46.8	80.0	845	47.4	74.8	104	5.8	91.2
system	Yes	209	41.5	20.0	285	56.5	25.2	10	2.0	8.8

Source: 2021 RLLP beneficiary household questionnaire

3.5.10.3 Adoption of Integrated soil fertility management across the different AEZ.

The adoption of ISFM technologies was found to be higher in Weyena Dega, Dega and followed by Upper Kolla. The adoption of ISFM average 56.3%; in Weyena Dega; 48.3% in Dega and 10.3% in upper Kolla. The table below illustrates the adoption of integrated soil fertility management practices in line with the AEZ.

Table 36: Adoption of ISFM across AEZ.

Integrated Soil Fertility Management (ISFM) technologies		Agro-ecological zone of the watershed								
		Dega			Upper Kolla			Weyena Dega		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Improved compost making	No	818	39.0	90.9	284	13.5	96.6	996	47.5	91.1
	Yes	82	43.4	9.1	10	5.3	3.4	97	51.3	8.9
Bio-slurry	No	547	36.2	60.8	249	16.5	84.7	713	47.2	65.2
	Yes	353	45.4	39.2	45	5.8	15.3	380	48.8	34.8
Vermicomposting	No	636	35.8	70.7	271	15.3	92.2	868	48.9	79.4
	Yes	264	51.6	29.3	23	4.5	7.8	225	43.9	20.6
Use of a bio-digester	No	270	30.2	30.0	179	20.0	60.9	446	49.8	40.8
	Yes	630	45.3	70.0	115	8.3	39.1	647	46.5	59.2
Organic manure management	No	820	40.6	91.1	250	12.4	85.0	952	47.1	87.1
	Yes	80	30.2	8.9	44	16.6	15.0	141	53.2	12.9
Lime and gypsum application	No	721	40.4	80.1	233	13.1	79.3	829	46.5	75.8
	Yes	179	35.5	19.9	61	12.1	20.7	264	52.4	24.2

Source: 2021 RLLP beneficiary household questionnaire

3.5.10.4 Household adoption rate of ISFM technologies

The adoption rate of ISFM technologies is higher in Male headed households compared to the female headed households. In female headed households, Bio-slurry and Vermi-composting are the most common ISFM technologies; while in Male headed households, the use of Use of a bio-digester, Organic manure management and Lime and gypsum application are the most commonly adopted ISFM technologies adopted. The table below illustrates the adoption of rate of each of the ISFM technologies disaggregated by the sex of the household head.

Table 37:Household Adoption of ISFM technologies

Integrated Soil Fertility Management (ISFM) technologies		Category of household					
		Female headed household			Male headed household		
		Count	Row %	Col %	Count	Row %	Col %
Improved compost making	No	701	33.4	91.9	1397	66.6	91.7
	Yes	62	32.8	8.1	127	67.2	8.3
Bio-slurry	No	503	33.3	65.9	1006	66.7	66.0
	Yes	260	33.4	34.1	518	66.6	34.0

Vermicomposting	No	599	33.7	78.5	1176	66.3	77.2
	Yes	164	32.0	21.5	348	68.0	22.8
Use of a bio-digester	No	304	34.0	39.8	591	66.0	38.8
	Yes	459	33.0	60.2	933	67.0	61.2
Organic manure management	No	677	33.5	88.7	1345	66.5	88.3
	Yes	86	32.5	11.3	179	67.5	11.7
Lime and gypsum application	No	595	33.4	78.0	1188	66.6	78.0
	Yes	168	33.3	22.0	336	66.7	22.0

Source: 2021 RLLP beneficiary household questionnaire

3.5.10.5 Adoption rate of ISFM technologies disaggregated by type of beneficiaries

The adoption rate of ISFM technologies is exceedingly high among the Direct beneficiaries compared with that of the indirect beneficiaries. Within the direct beneficiaries, improved compost making, bio slurry and organic manure management are the most commonly adopted ISFM technologies. The average adoption rate of the ISFM technologies lies at 87.7% while that of indirect beneficiaries lies at 12.3%. The table below illustrates the adoption of rate of each of the integrated soil fertility management technologies supported by the RLLP project.

Table 38: Adoption of ISFM technologies disaggregated by type of beneficiaries

Integrated Soil Fertility Management (ISFM) technologies		Category of beneficiary					
		Direct beneficiary			Indirect beneficiary		
		Count	Row %	Col %	Count	Row %	Col %
Improved compost making	No	440	81.3	22.0	101	18.7	34.9
	Yes	1558	89.2	78.0	188	10.8	65.1
Bio-slurry	No	1824	86.9	91.3	274	13.1	94.8
	Yes	174	92.1	8.7	15	7.9	5.2
Vermicomposting	No	1287	85.3	64.4	222	14.7	76.8
	Yes	711	91.4	35.6	67	8.6	23.2
Use of a bio-digester	No	1532	86.3	76.7	243	13.7	84.1
	Yes	466	91.0	23.3	46	9.0	15.9
Organic manure management	No	758	84.7	37.9	137	15.3	47.4
	Yes	1240	89.1	62.1	152	10.9	52.6
Lime and gypsum application	No	1777	87.9	88.9	245	12.1	84.8
	Yes	221	83.4	11.1	44	16.6	15.2

Source: 2021 RLLP beneficiary household questionnaire

3.5.11 Adoption of environmentally friendly forage development practices.

RLLP promoted the adoption of high quality and quantity forage in pasture and along farm boundaries, gullies and back yards. This was aimed at minimizing the dependence on crop residue as livestock feed, and to ensure increased use of biomass for soil fertility improvement. Other environmentally friendly forage practices include efficient use of livestock feed resources through feed treatment and improvement of feeding troughs. The project RLLP further promoted appropriate integration of agro-sylvo-animal husbandry practices at homestead level based on the needs of local farmers and the suitability of local conditions. Practicing an integration of multi-purpose food and tree cropping with livestock rearing at the homestead with an aim of improving the fertility and organic matter content (including carbon) of soils, and increase crop yields and household food security. The survey investigated the adoption of the above practices by individual farmers and the table below illustrate the findings.

$$\text{HHs adopting environmentaly friendly forage development practices} = \frac{\text{Findings of the study}}{\text{Sample size for HH}} \times \text{July 2021 cumulative target}$$

$$\text{HHs adopting environmentally forage development practices } = \frac{1585}{3794} \times 173{,}326$$

$$\text{Female headed household adopting environmentally friendly forage development practices } = \frac{\text{Findings of the study}}{\text{Sample size for HH}} \times \text{July 2021 cumulative target}$$

$$\text{Female headed households adopting environmentally forage development practices } = \frac{516}{1130} \times 29526$$

From the computation above, 72409 households were found to have practiced environmentally forage development practices; while 13,482 female headed households were found to have adopted environmentally friendly forage development practices.

3.5.11.1 Adoption of environmentally friendly forage development practices within & across the regions.

The adoption rate of environmentally friendly forage development practices is higher in regions where livestock production is highly practiced. These include SNNPR, Benshangul Gumuz, Gambela and some parts of Amhara and Oromia. The most common environmentally friendly forage development practices adopted are: production of high quality; quantity forage along boundaries, construction of gullies & backyards and the use of livestock feed resources. The table below illustrates the adoption of environmentally friendly forage development practices across the regions

Table 39: Adoption of environmentally friendly forage development practices.

Environmentally friendly forage development practices		Region of the respondent																	
		Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
High-quality forage	No	346	45.0	32.4	60	7.8	21.3	48	6.2	47.5	145	18.9	28	67	8.7	24.6	103	13.4	32.2
	Yes	721	40.3	67.6	222	12.4	78.7	53	3.0	52.5	372	20.8	72	205	11.5	75.4	217	12.1	67.8
Gully's & backyards	No	709	49.3	66.4	126	8.8	44.7	80	5.6	79.2	233	16.2	45.1	85	5.9	31.3	205	14.3	64.1
	Yes	358	31.9	33.6	156	13.9	55.3	21	1.9	20.8	284	25.3	54.9	187	16.7	68.8	115	10.3	35.9
Livestock feed resources	No	385	35.2	36.1	168	15.4	59.6	71	6.5	70.3	235	21.5	45.5	90	8.2	33.1	145	13.3	45.3
	Yes	682	46.6	63.9	114	7.8	40.4	30	2.0	29.7	282	19.2	54.5	182	12.4	66.9	175	11.9	54.7
Feed treatment	No	374	31.4	35.1	227	19.0	80.5	80	6.7	79.2	247	20.7	47.8	102	8.6	37.5	162	13.6	50.6
	Yes	693	50.7	64.9	55	4.0	19.5	21	1.5	20.8	270	19.8	52.2	170	12.4	62.5	158	11.6	49.4
Improved feed troug	No	640	41.9	60	242	15.8	85.8	89	5.8	88.1	234	15.3	45.3	75	4.9	27.6	247	16.2	77.2
	Yes	427	41.4	40	40	3.9	14.2	12	1.2	11.9	283	27.4	54.7	197	19.1	72.4	73	7.1	22.8
Agro-sylvo	No	862	41.4	80.8	277	13.3	98.2	93	4.5	92.1	506	24.3	97.9	55	2.6	20.2	289	13.9	90.3
	Yes	205	43.0	19.2	5	1.0	1.8	8	1.7	7.9	11	2.3	2.1	217	45.5	79.8	31	6.5	9.7

Source: 2021 RLLP beneficiary household questionnaire

3.5.11.2 Adoption of Environmentally friendly forage development practices within across the phases of the project

The rate of adoption of environmentally friendly forage development practices is high among watersheds in SLMP-II compared to both SLMP-I and RLLP. Within the watersheds, Agro-sylvo, High-quality forage are Gully's & backyards are the most commonly adopted environmentally friendly forage development practices in SLMP-I; High-quality forage and Livestock feed resources are the most commonly adopted environmentally friendly forage development practices among watersheds in SLMP-II. High-quality forage and Feed treatment are the most commonly adopted practices among watersheds in the New RLLP. The table below describes the Adoption of environmentally friendly forage development practices within and across SLMP program phases.

Table 40: Adoption of environmentally friendly forage development practices.

Environmentally friendly forage development practices		Project phases								
		SLMP-I			SLMP-II			New RLLP		
		Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %
High-quality forage	No	339	48.3	32.5	333	47.4	29.5	30	4.3	26.3
	Yes	704	44.4	67.5	797	50.3	70.5	84	5.3	73.7
Gully's & backyards	No	610	45.1	58.5	674	49.8	59.6	69	5.1	60.5
	Yes	433	46.4	41.5	456	48.8	40.4	45	4.8	39.5
Livestock feed resources	No	455	45.3	43.6	490	48.8	43.4	59	5.9	51.8
	Yes	588	45.8	56.4	640	49.9	56.6	55	4.3	48.2
Feed treatment	No	495	45.4	47.5	542	49.7	48.0	53	4.9	46.5
	Yes	548	45.8	52.5	588	49.1	52.0	61	5.1	53.5
Improved feed trough	No	678	46.7	65.0	711	49.0	62.9	63	4.3	55.3
	Yes	365	43.7	35.0	419	50.2	37.1	51	6.1	44.7
Agro-sylvo	No	909	44.8	87.2	1005	49.6	88.9	113	5.6	99.1
	Yes	134	51.5	12.8	125	48.1	11.1	1	0.4	0.9

Source: 2021 RLLP beneficiary household questionnaire

3.5.11.3 Adoption of environmentally friendly forage development practices across the AEZ

The adoption of environmentally friendly forage development practices is high in Weyena Dega with a rate of 47.7%; followed by Dega with a rate of 44.0% and then followed by Upper Kolla with a rate of 8.4%. The table below illustrates the adoption of each of the environmentally friendly forage development practices within and across the three agro-ecological zones.

Table 41: Adoption of environmentally friendly forage development practices across the AEZ

Environmentally friendly forage development practices		Agro-ecological zone of the watershed								
		Dega			Upper Kolla			Weyena Dega		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
High-quality forage	No	274	39.0	30.4	83	11.8	28.2	345	49.1	31.6
	Yes	626	39.5	69.6	211	13.3	71.8	748	47.2	68.4
Gully's & backyards	No	538	39.8	59.8	168	12.4	57.1	647	47.8	59.2
	Yes	362	38.8	40.2	126	13.5	42.9	446	47.8	40.8
Livestock feed resources	No	327	32.6	36.3	184	18.3	62.6	493	49.1	45.1
	Yes	573	44.7	63.7	110	8.6	37.4	600	46.8	54.9
Feed treatment	No	330	30.3	36.7	231	21.2	78.6	529	48.5	48.4
	Yes	570	47.6	63.3	63	5.3	21.4	564	47.1	51.6
Improved feed troug	No	515	35.5	57.2	256	17.6	87.1	681	46.9	62.3
	Yes	385	46.1	42.8	38	4.6	12.9	412	49.3	37.7
Agro-sylvo	No	777	38.3	86.3	281	13.9	95.6	969	47.8	88.7
	Yes	123	47.3	13.7	13	5.0	4.4	124	47.7	11.3

Source: 2021 RLLP beneficiary household questionnaire

3.5.11.4 Household adoption of environmentally friendly forage development practices

The adoption of environmentally friendly forage development practices was found to be higher in male headed households. The average rate of adoption of environmentally friendly forage development practices among male headed households lies at 66.47%; while that of female headed households was found to be at 33.53%. The adoption of Production of high quality; quantity forage along boundaries ranks highest in both male and female headed households, followed by Use of livestock feed resources and Adoption of feed treatment and the others follow.

The table below describes the adoption rate of each of the environmentally friendly forage development practices disaggregated by gender of the household head.

Table 42: Household adoption of environmentally friendly forage development practices

Environmentally friendly forage development practices		Category of household					
		Female headed household			Male headed household		
		Count	Row %	Col %	Count	Row %	Col %
	No	247	35.2	32.4	455	64.8	29.9

High-quality forage	Yes	516	32.6	67.6	1069	67.4	70.1
Gully's & backyards	No	441	32.6	57.8	912	67.4	59.8
	Yes	322	34.5	42.2	612	65.5	40.2
Livestock feed resources	No	344	34.3	45.1	660	65.7	43.3
	Yes	419	32.7	54.9	864	67.3	56.7
Feed treatment	No	358	32.8	46.9	732	67.2	48.0
	Yes	405	33.8	53.1	792	66.2	52.0
Improved feed troug	No	491	33.8	64.4	961	66.2	63.1
	Yes	272	32.6	35.6	563	67.4	36.9
Agro-sylvo	No	672	33.2	88.1	1355	66.8	88.9
	Yes	91	35.0	11.9	169	65.0	11.1

Source: 2021 RLLP beneficiary household questionnaire

3.5.11.5 The adoption Environmentally friendly forage development practices by type of beneficiary.

The rate of adoption of Environmentally friendly forage development practices was found to be high among the direct beneficiaries. The most adopted Environmentally friendly forage development practices at a household level are: Use of improved feed troughs with 91% adoption rate; Adoption of feed treatment (90.1%); Use of livestock feed resources (89.3%) among others. The adoption of environmentally friendly forage development practices among indirect beneficiaries is relatively low. This is because most of these respondents were engaged in other livelihood activities rather than livestock production. They were mainly engaged in Value addition of produce, processing, trade among others. The table below illustrates the adoption of each of the environmentally friendly forage development practices.by type of beneficiaries

Table 43: Adoption of environmentally forage development practices

		What category of beneficiary are you					
		Direct beneficiary			Indirect beneficiary		
Environmentally friendly forage development practices		Count	Row %	Col %	Count	Row %	Col %
High-quality forage	No	590	84.0	29.5	112	16.0	38.8
	Yes	1408	88.8	70.5	177	11.2	61.2
Gully's & backyards	No	1186	87.7	59.4	167	12.3	57.8
	Yes	812	86.9	40.6	122	13.1	42.2
Livestock feed resources	No	852	84.9	42.6	152	15.1	52.6
	Yes	1146	89.3	57.4	137	10.7	47.4
Feed treatment	No	920	84.4	46.0	170	15.6	58.8
	Yes	1078	90.1	54.0	119	9.9	41.2
Improved feed trough	No	1238	85.3	62.0	214	14.7	74.0
	Yes	760	91.0	38.0	75	9.0	26.0
Agro-sylvo	No	1768	87.2	88.5	259	12.8	89.6

Yes	230	88.5	11.5	30	11.5	10.4

Source: 2021 RLLP beneficiary household questionnaire

Environmentally friendly forage development practices in Tera Feta & Oyda

3.5.12 Adoption of crop diversity

The survey team examined the adoption of crop diversity in the different regions. Key aspects that were investigated include intercropping, alley cropping, agro-forestry among others. At the regional level, the rate of adoption of crop diversity is high in Amhara (55.38%); Oromia (19.48%); SNNPR. (14.93%) relative to Sidama, Benshangul Gumuz and Gambela. The most crop diversity practices across the regions is inter cropping, followed by agro-forestry, followed by Adopting the practice of planting improved and suitable crops for particular soils and environmental conditions and then followed by Alley cropping.

$$\text{HH adopting crop diversity practices } \frac{\text{Findings of the survey}}{\text{Sample size for HH}} \times \text{July 2021 cumulative target}$$

$$\text{Households adopting crop diversity practices } = \frac{1740}{3794} \times 173{,}326$$

$$\text{Female headed households adopting crop diversity practices} = \frac{\text{Findings of the study}}{\text{Sample size for HH}} \times \text{July 2021 cumulative target}$$

$$\text{Female headed households adopting crop diversity practices } = \frac{577}{1030} \times 29{,}526$$

From the above computations, a total of 79490 households have adopted crop diversity practices; while 16540 female headed households were found to have adopted crop diversity practices on their farm lands.

3.5.12.1 Adoption of crop diversity across the regions.

Within the regions, specific crop diversity practices have different adoption rates. **In Amhara**, Intercropping takes the lead in adoption, followed by Alley cropping, followed by Planting improved and suitable crops for particular soils and environmental conditions and then Agroforestry. In Benshangul Gumuz, Alley cropping and Agroforestry are highly adopted, In Oromia, Agroforestry and Planting improved and suitable crops for particular soils and environmental conditions takes the lead in adoption; while in SNNPR, Intercropping, Agroforestry and planting improved and suitable crops for particular soils and environmental conditions are highly adopted. The table below describes the rate of adoption of crop diversity within and across the regions

Table 44: Adoption crop diversity across the regions

Crop diversity practices		Region of the respondent																	
		Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Intercropping	No	187	34.2	17.5	75	13.7	26.6	47	8.6	46.5	218	39.9	42.2	62	10.2	22.8	20	3.7	6.3
	Yes	880	50.6	82.5	207	11.9	73.4	54	3.1	53.5	299	17.2	57.8	110	5.9	40.4	300	17.2	93.8
Alley cropping	No	339	28.2	31.8	241	20	85.5	92	7.6	91.1	348	28.9	67.3	56	4.4	20.6	183	15.2	57.2
	Yes	728	67.2	68.2	41	3.8	14.5	9	0.8	8.9	169	15.6	32.7	216	16.6	79.4	137	12.6	42.8
Agroforestry	No	463	38.4	43.4	212	17.6	75.2	68	5.6	67.3	313	26	60.5	72	5.6	26.5	150	12.4	46.9
	Yes	604	55.9	56.6	70	6.5	24.8	33	3.1	32.7	204	18.9	39.5	200	15.6	73.5	170	15.7	53.1
Improved & suitable crop	No	362	44.6	33.9	185	22.8	65.6	24	3	23.8	130	16	25.1	115	12.4	42.3	110	13.6	34.4
	Yes	705	47.8	66.1	97	6.6	34.4	77	5.2	76.2	387	26.2	74.9	157	9.6	57.7	210	14.2	65.6

Source: 2021 RLLP beneficiary household questionnaire

3.5.12.2 Adoption of crop diversity across the phases of SLMP

Across the phases, the survey discovered that Intercropping is highly adopted in phases (SLMP-I & II) while Agroforestry and Planting improved and suitable crops for particular soils and environmental conditions are highly adopted in SLMP-II. Within the Phases, Within the phases, Intercropping and Planting improved and suitable crops for particular soils and environmental conditions are common practices carried out in SLMP-I, While Agro forestry and Alley cropping are highly adopted among watersheds in SLMP-II. The table below describes the rate of adoption of crop diversity within and across the SLMP phases.

Table 45: Crop diversity adoption within and across the phases

Crop diversity practices		Project phases								
		SLMP-I			SLMP-II			New RLLP		
		Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %
Intercropping	No	211	38.6	20.2	267	48.8	23.6	69	12.6	60.5
	Yes	832	47.8	79.8	863	49.6	76.4	45	2.6	39.5
Alley cropping	No	536	44.6	51.4	567	47.1	50.2	100	8.3	87.7
	Yes	507	46.8	48.6	563	51.9	49.8	14	1.3	12.3
Agroforestry	No	553	45.9	53.0	566	46.9	50.1	87	7.2	76.3
	Yes	490	45.3	47.0	564	52.2	49.9	27	2.5	23.7
Improved & suitable	No	376	46.4	36.0	415	51.2	36.7	20	2.5	17.5
crop	Yes	667	45.2	64.0	715	48.4	63.3	94	6.4	82.5

Source: 2021 RLLP beneficiary household questionnaire

Crop diversity practices in Kersa- Oromia

3.5.12.3 Adoption of crop diversity disaggregated by Agro Ecological Zones

Different agro-ecological zones have different rates of each of the crop diversity practices. Planting improved and suitable crops for particular soils and environment is highly adopted compared to the other three (inter cropping, Alley cropping and agroforestry). In Dega Alley cropping highly adopted compared to the other three (inter cropping, agroforestry and planting improved & suitable crops for particular soils and environment). In Weyena Dega, the adoption rates of agroforestry and Planting improved and suitable crops for particular soils and environmental conditions are very high. With Dega, Intercropping and agroforestry take the lead in adoption; in Upper Kolla, Planting improved and suitable crops for particular soils and environmental conditions takes the lead in adoption while in Weyena Dega, intercropping still takes the lead in adopting crop diversity practices as illustrated in the table below.

Table 46: Adoption of crop diversity practices across AEZ

Crop diversity practices		Agro-ecological zone of the watershed								
		Dega			Upper Kolla,			Weyena Dega		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Intercropping	No	185	33.8	20.6	99	18.1	33.7	263	48.1	24.1
	Yes	715	41.1	79.4	195	11.2	66.3	830	47.7	75.9
Alley	No	366	30.4	40.7	258	21.4	87.8	579	48.1	53.0
cropping	Yes	534	49.3	59.3	36	3.3	12.2	514	47.4	47.0
Agroforestry	No	426	35.3	47.3	206	17.1	70.1	574	47.6	52.5
	Yes	474	43.8	52.7	88	8.1	29.9	519	48.0	47.5
Improved &	No	290	35.8	32.2	150	18.5	51.0	371	45.7	33.9
suitable crop	Yes	610	41.3	67.8	144	9.8	49.0	722	48.9	66.1

Source: 2021 RLLP beneficiary household questionnaire

3.5.12.4 Adoption of crop diversity practices at a household level.

At the household level, the adoption of intercropping takes a lead with 33.2% for female headed households and 66.8% for male headed households. This is followed by Planting improved and suitable crops for particular soils and environmental conditions with 31.7% for female headed households and 68.3% for Female headed households. Among the Male headed households, Agroforestry, Alley cropping and intercropping are ranked 1st 2nd and 3rd in terms of adoption; while among the Male headed households, Intercropping and Planting improved and suitable crops for particular soils and environmental conditions are ranked 1st and 2nd in adoption. The table below describes the adoption rate of the different crop diversity practices at a household level.

Table 47: Adoption of crop diversity practices at a household level

Crop diversity practices		Category of household					
		Female headed household			Male headed household		
		Count	Row %	Col %	Count	Row %	Col %
Intercropping	No	186	34.0	24.4	361	66.0	23.7
	Yes	577	33.2	75.6	1163	66.8	76.3

Alley	No	390	32.4	51.1	813	67.6	53.3
cropping	Yes	373	34.4	48.9	711	65.6	46.7
Agroforestry	No	385	31.9	50.5	821	68.1	53.9
	Yes	378	35.0	49.5	703	65.0	46.1
Improved &	No	295	36.4	38.7	516	63.6	33.9
suitable crop	Yes	468	31.7	61.3	1008	68.3	66.1

Source: 2021 RLLP beneficiary household questionnaire

3.5.12.5 Adoption of crop diversity practices disaggregated by type of beneficiaries.

The rate of adoption of crop diversity is very high among the direct beneficiaries. The average adoption crop diversity practices rate was found to be 88.9% for direct beneficiaries and 11.1% for indirect beneficiaries. Planting improved and suitable crops for particular soils and environmental conditions still takes a lead among the crop diversity practices with 90.5%; and the others follow. Amongst the Direct beneficiaries, the adoption of Intercropping and Planting improved and suitable crops for particular soils and environmental conditions are ranked higher than Alley cropping and Agroforestry; while among the indirect beneficiaries the adoption of intercropping is higher than the rest of the crop diversity practices. The table below describes the adoption of crop diversity practices disaggregated by type of beneficiaries.

Table 48: Adoption of crop diversity practices disaggregated by the type of project beneficiaries

		Category of beneficiary					
		Direct beneficiary			Indirect beneficiary		
Crop diversity	practices	Count	Row %	Col %	Count	Row %	Col %
Intercropping	No	468	85.6	23.4	79	14.4	27.3
	Yes	1530	87.9	76.6	210	12.1	72.7
Alley	No	1038	86.3	52.0	165	13.7	57.1
cropping	Yes	960	88.6	48.0	124	11.4	42.9
Agroforestry	No	1041	86.3	52.1	165	13.7	57.1
	Yes	957	88.5	47.9	124	11.5	42.9
Improved &	No	662	81.6	33.1	149	18.4	51.6
suitable crop	Yes	1336	90.5	66.9	140	9.5	48.4

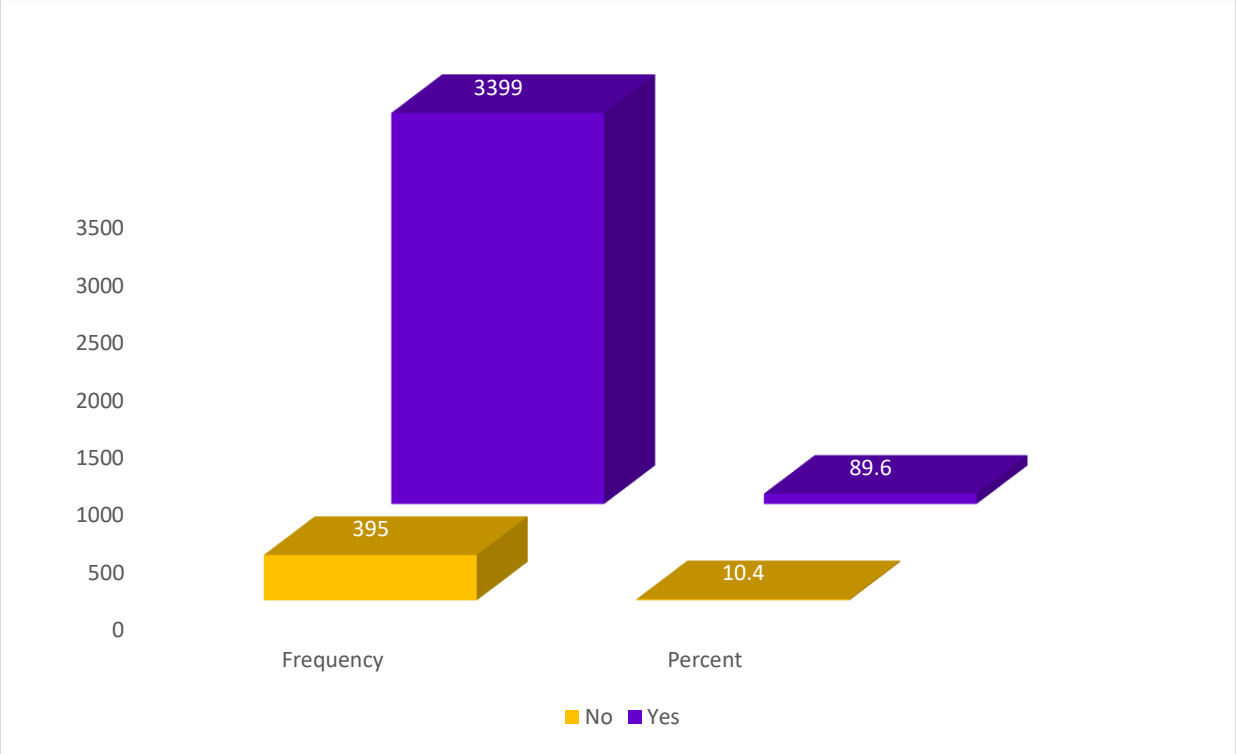
Source: 2021 RLLP beneficiary household questionnaire

3.5.13 Adoption of non-traditional income generating activities

3.5.13.1 General rate of adoption of non-traditional income generating activities

There a number of non-traditional incomes generating activities that were and are still being supported the RLLP project. These non-traditional income generating activities are classified into three. That is the on-farm, the off-farm and the non-farm income generating activities. The findings of the study indicated that over 89% of the project beneficiaries have adopted at least one of the non-traditional income generating activities.

Figure 3: Adoption of non-traditional income generating activities supported by the RLLP project



Source: 2021 RLLP beneficiary household questionnaire

Table 49: Adoption of Non-traditional income generating activities

Ever adopted non-traditional income generating activities	Frequency	Percent	Cumulative Percent
No	395	10.4	10.4
Yes	3399	89.6	100.0
Total	**3794**	**100.0**	

Source: 2021 RLLP beneficiary household questionnaire

3.5.13.2 Adoption rate disaggregated by sex of the household head

The findings of the survey indicate that 86.7% of the female headed households adopted non-traditional income generating activities; the study further revealed that 90.8% of all the targeted male headed households adopted non-traditional income generating activities. Table below illustrates the adoption of nontraditional income generating activities.

Table 50: Adoption of nontraditional income generating activities

Ever adopted any of the Non-traditional income	Category of household					
	Female headed household			Male headed household		
	Count	Row N %	Column N %	Count	Row N %	Column N %
No	150	38.0%	13.3%	245	62.0%	9.2%
Yes	980	28.8%	86.7%	2419	71.2%	90.8%

Source: 2021 RLLP beneficiary household questionnaire

3.5.14 The specific type of nontraditional income generating activities under the three categories.

The section below describes the adoption of the specific non-traditional income generating activities under the three categories (on-farm, off-farm and non-farm) income generating activities

3.5.14.1 Adoption of **non-traditional** activities (Regional analysis).

The adoption of Non-traditional income generating activities varies across the regions. For example, the adoption of Apiculture in Oromia with a rate of 48.8%; The adoption of poultry is high in Amhara with 41.4%, the adoption vegetable growing is high in SNNPR with 35.4%. Within the regions. The table below describes the adoption of non-traditional income generating activities within and across the regions.

Table 51:Adoption of non-traditional income generating activities across the region

		Region of the respondent																	
		Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR		
Non-traditional income generating activities		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Apiculture	No	841	30.4	84.3	158	5.7	70.2	78	2.8	87.6	620	22.4	66.7	198	7.2	81.5	869	31.4	95.1
	Yes	157	24.7	15.7	67	10.6	29.8	11	1.7	12.4	310	48.8	33.3	45	7.1	18.5	45	7.1	4.9
Poultry	No	267	16.3	26.8	147	9.0	65.3	71	4.3	79.8	584	35.7	62.8	133	8.1	54.7	432	26.4	47.3
	Yes	731	41.4	73.2	78	4.4	34.7	18	1.0	20.2	346	19.6	37.2	110	6.2	45.3	482	27.3	52.7
Sheep &	No	248	16.8	24.8	102	6.9	45.3	66	4.5	74.2	519	35.2	55.8	133	9.0	54.7	406	27.5	44.4
goat	Yes	750	39.0	75.2	123	6.4	54.7	23	1.2	25.8	411	21.4	44.2	110	5.7	45.3	508	26.4	55.6
fattening																			
Vegetable	No	839	33.9	84.1	208	8.4	92.4	58	2.3	65.2	574	23.2	61.7	211	8.5	86.8	588	23.7	64.3
growing	Yes	159	17.3	15.9	17	1.8	7.6	31	3.4	34.8	356	38.7	38.3	32	3.5	13.2	326	35.4	35.7
Fruit	No	854	32.7	85.6	185	7.1	82.2	49	1.9	55.1	659	25.2	70.9	213	8.2	87.7	651	24.9	71.2
farming	Yes	144	18.3	14.4	40	5.1	17.8	40	5.1	44.9	271	34.4	29.1	30	3.8	12.3	263	33.4	28.8
Cash crop	No	857	36.9	85.9	191	8.2	84.9	37	1.6	41.6	537	23.1	57.7	155	6.7	63.8	546	23.5	59.7
growing	Yes	141	13.1	14.1	34	3.2	15.1	52	4.8	58.4	393	36.5	42.3	88	8.2	36.2	368	34.2	40.3

improved cook stoves production	No	817	27.0	81.9	204	6.7	90.7	78	2.6	87.6	785	25.9	84.4	232	7.7	95.5	910	30.1	99.6
	Yes	181	48.5	18.1	21	5.6	9.3	11	2.9	12.4	145	38.9	15.6	11	2.9	4.5	4	1.1	.4
improved cook stoves marketing	No	980	29.4	98.2	216	6.5	96.0	77	2.3	86.5	911	27.3	98.0	242	7.3	99.6	910	27.3	99.6
	Yes	18	28.6	1.8	9	14.3	4.0	12	19.0	13.5	19	30.2	2.0	1	1.6	.4	4	6.3	.4

Source: 2021 RLLP beneficiary household questionnaire

3.5.14.2 Adoption of nontraditional income generating activities disaggregated by the SLMP program phases.

The findings of the study indicate the adoption of nontraditional income generating activities is high among watersheds in SLMP-II, followed by watersheds in SLMP-I and then followed by the ones in RLLP as illustrated in the table below.

Table 52: Adoption of nontraditional income generating activities within and across the phases of the program.

Non-traditional income generating activities		Project phases								
		SLMP-I			SLMP-II			New RLLP		
		Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %
Apiculture (bee keeping)	No	825	38.7	61.4	1082	50.8	67.0	223	10.5	69.3
	Yes	519	45.1	38.6	533	46.3	33.0	99	8.6	30.7
Poultry	No	548	44.4	40.8	551	44.7	34.1	134	10.9	41.6
	Yes	796	38.9	59.2	1064	52.0	65.9	188	9.2	58.4
Sheep & goat fattening	No	417	38.5	31.0	554	51.2	34.3	111	10.3	34.5
	Yes	927	42.2	69.0	1061	48.2	65.7	211	9.6	65.5
Vegetable growing	No	818	41.4	60.9	969	49.0	60.0	191	9.7	59.3
	Yes	526	40.4	39.1	646	49.6	40.0	131	10.1	40.7
Fruit farming	No	897	41.5	66.7	1036	48.0	64.1	227	10.5	70.5
	Yes	447	39.9	33.3	579	51.7	35.9	95	8.5	29.5
Cash crop growing	No	818	40.3	60.9	1040	51.3	64.4	171	8.4	53.1

	Yes	526	42.0	39.1	575	45.9	35.6	151	12.1	46.9
Production of	No	983	38.4	73.1	1282	50.1	79.4	293	11.5	91.0
improved cook stove	Yes	361	49.9	26.9	333	46.1	20.6	29	4.0	9.0
Marketing of	No	1256	40.5	93.5	1545	49.8	95.7	301	9.7	93.5
improved cook stove	Yes	88	49.2	6.5	70	39.1	4.3	21	11.7	6.5

Source: 2021 RLLP beneficiary household questionnaire

3.5.14.3Nontraditional income generating activates based on AEZs.

From the table below, Bee keeping is highly adopted both in Dega and Weyena Dega relative to Upper kollaPoultry is highly adopted in all the three AEZs Sheep & goat fattening is highly adopted in Dega, production and marketing of improved cook stoves are highly adopted in upper kola. The table below fully describes the adoption of nontraditional income generating activities in the different AEZs

Table 53: Adoption of nontraditional income generating activities in the different AEZs

Non-traditional livelihood activities		Agro-ecological zone of the watershed								
		Dega			Upper Kolla			Weyena Dega		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Apiculture	No	1182	42.8	80.1	184	6.7	73.9	1398	50.6	83.5
	Yes	294	46.3	19.9	65	10.2	26.1	276	43.5	16.5
Poultry	No	640	39.2	43.4	171	10.5	68.7	823	50.4	49.2
	Yes	836	47.4	56.6	78	4.4	31.3	851	48.2	50.8
Sheep &	No	504	34.2	34.1	142	9.6	57.0	828	56.2	49.5
goat	Yes	972	50.5	65.9	107	5.6	43.0	846	43.9	50.5
fattening										
Vegetable	No	1065	43.0	72.2	210	8.5	84.3	1203	48.5	71.9
growing	Yes	411	44.6	27.8	39	4.2	15.7	471	51.1	28.1
	No	1124	43.0	76.2	183	7.0	73.5	1304	49.9	77.9

Fruit farming	Yes	352	44.7	23.8	66	8.4	26.5	370	47.0	22.1
Cash crop growing	No	1059	45.6	71.7	170	7.3	68.3	1094	47.1	65.4
	Yes	417	38.8	28.3	79	7.3	31.7	580	53.9	34.6
improved cook stoves production	No	1303	43.1	88.3	218	7.2	87.6	1505	49.7	89.9
	Yes	173	46.4	11.7	31	8.3	12.4	169	45.3	10.1
improved cook stoves marketing	No	1452	43.5	98.4	229	6.9	92.0	1655	49.6	98.9
	Yes	24	38.1	1.6	20	31.7	8.0	19	30.2	1.1

Source: 2021 RLLP beneficiary household questionnaire

3.5.14.4 Adoption of nontraditional income generating activities by household head.

Within the Male headed households, the adoption of Vegetable growing and Sheep & goat fattening ranks 1st and 2nd respectively. In the female headed households on the other hand, Poultry, vegetable growing and fruit farming ranks 1st, 2nd and 3rd respectively in terms of adoption. This is illustrated in the table below.

Table 54: Adoption nontraditional income generating activities at a household level

Non-traditional income generating activities		Category of household					
		Female headed household			Male headed household		
		Count	Row %	Col %	Count	Row %	Col %
Apiculture	No	839	30.4	85.6	1925	69.6	79.6
	Yes	141	22.2	14.4	494	77.8	20.4
Poultry	No	501	30.7	51.1	1133	69.3	46.8
	Yes	479	27.1	48.9	1286	72.9	53.2
Sheep &	No	405	27.5	41.3	1069	72.5	44.2
goat	Yes	575	29.9	58.7	1350	70.1	55.8
fattening							
Vegetable	No	681	27.5	69.5	1797	72.5	74.3
growing	Yes	299	32.5	30.5	622	67.5	25.7
Fruit farming	No	714	27.3	72.9	1897	72.7	78.4
	Yes	266	33.8	27.1	522	66.2	21.6
Cash crop	No	670	28.8	68.4	1653	71.2	68.3
growing	Yes	310	28.8	31.6	766	71.2	31.7
improved	No	839	27.7	85.6	2187	72.3	90.4
cook stoves	Yes	141	37.8	14.4	232	62.2	9.6
production							
improved	No	950	28.5	96.9	2386	71.5	98.6
cook stoves	Yes	30	47.6	3.1	33	52.4	1.4
marketing							

Source: 2021 RLLP beneficiary household questionnaire

3.5.14.5 The benefits adopting nontraditional income generating activities to the beneficiaries and the entire community

The survey discovered that the adoption of nontraditional income generating activities resulted in a number of benefits not only to the individual beneficiaries but to the entire community. The benefits include: Diversification of livelihood sources, Increased household incomes, Transformation life from subsistence to commercial livelihood, adopting new ways being resilient to climate shocks, Improved welfare and standards of living, Increased resilience of natural resources of the community, Reduced exposure to shocks of climate change, Reduced vulnerability to climate change and Adopting value addition to improve the quality of produce. The table below illustrates how the study participants reported about the contribution of adopting nontraditional income generating activities to the different communities

Table 55: The contribution of adopting nontraditional income generating activities.

		Region of the respondent																	
		Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR		
Contributions		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Livelihood diversification	No	84	11.2	8.4	66	8.8	29.3	38	5.1	42.7	240	32.0	25.8	69	9.2	28.4	252	33.6	27.6
	Yes	914	34.5	91.6	159	6.0	70.7	51	1.9	57.3	690	26.0	74.2	174	6.6	71.6	662	25.0	72.4
Increased incomes	No	112	17.3	11.2	70	10.8	31.1	29	4.5	32.6	213	32.9	22.9	35	5.4	14.4	188	29.1	20.6
	Yes	886	32.2	88.8	155	5.6	68.9	60	2.2	67.4	717	26.1	77.1	208	7.6	85.6	726	26.4	79.4
Adopted commercial farming	No	589	32.8	59.0	114	6.4	50.7	54	3.0	60.7	424	23.6	45.6	133	7.4	54.7	480	26.8	52.5
	Yes	409	25.5	41.0	111	6.9	49.3	35	2.2	39.3	506	31.5	54.4	110	6.9	45.3	434	27.0	47.5
Resilience to climate shocks	No	730	40.5	73.1	137	7.6	60.9	77	4.3	86.5	403	22.4	43.3	116	6.4	47.7	339	18.8	37.1
	Yes	268	16.8	26.9	88	5.5	39.1	12	.8	13.5	527	33.0	56.7	127	8.0	52.3	575	36.0	62.9
Improved welfare	No	567	31.8	56.8	163	9.2	72.4	62	3.5	69.7	337	18.9	36.2	166	9.3	68.3	486	27.3	53.2
	Yes	431	26.6	43.2	62	3.8	27.6	27	1.7	30.3	593	36.7	63.8	77	4.8	31.7	428	26.5	46.8
	No	654	37.3	65.5	188	10.7	83.6	67	3.8	75.3	377	21.5	40.5	122	7.0	50.2	346	19.7	37.9

Increased natural resources	Yes	344	20.9	34.5	37	2.2	16.4	22	1.3	24.7	553	33.6	59.5	121	7.4	49.8	568	34.5	62.1
Reduced exposure to climate shocks	No	795	39.0	79.7	210	10.3	93.3	76	3.7	85.4	454	22.3	48.8	146	7.2	60.1	355	17.4	38.8
	Yes	203	14.9	20.3	15	1.1	6.7	13	1.0	14.6	476	34.9	51.2	97	7.1	39.9	559	41.0	61.2
Reduced vulnerability to climate change	No	770	37.4	77.2	210	10.2	93.3	78	3.8	87.6	455	22.1	48.9	147	7.1	60.5	399	19.4	43.7
	Yes	228	17.0	22.8	15	1.1	6.7	11	.8	12.4	475	35.4	51.1	96	7.2	39.5	515	38.4	56.3
Adopted value addition	No	802	31.7	80.4	217	8.6	96.4	71	2.8	79.8	626	24.7	67.3	187	7.4	77.0	629	24.8	68.8
	Yes	196	22.6	19.6	8	.9	3.6	18	2.1	20.2	304	35.1	32.7	56	6.5	23.0	285	32.9	31.2

3.5.14.6 Adoption of **on farm** income generating activities.

3.5.14.6.1 Regional analysis of the adoption of on farm income activities

The survey discovered that the adoption of the different **on-farm income** generating activities varies across the regions. Planting of trees for commercial purposes for example is highly adopted in both Oromia and Amhara; Planting of fruits (pineapples, Avocado, yellow banana, oranges, mangoes, lemons) is highly adopted in SNNPR, Planting of root crop (cassava, potatoes, carrots, yams, etc) is also highly adopted in SNNPR, Planting of improved & drought resistant crop varieties is highly adopted in Oromia, Planting of Tea and coffee is highly adopted in Oromia and SNNPR; while SNNPR & Oromia take a lead in the adoption of Planting Cereals (wheat, rice, maize, oat, barley, rye, millet and sorghum) and oil seeds. The table below describes the adoption of on farm income generating activities across the regions.

Table 56: Adoption of on-farm income generating activities (Regional analysis)

On-farm		Region of the respondent																	
		Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Trees for commercial purposes	No	448	27.5	47.2	67	4.1	28.6	59	3.6	64.1	375	23.0	41.3	143	8.8	54.0	539	33.0	54.4
	Yes	502	27.7	52.8	167	9.2	71.4	33	1.8	35.9	534	29.5	58.7	122	6.7	46.0	452	25.0	45.6
Planting of fruits	No	729	38.2	76.7	35	1.8	15.0	24	1.3	26.1	420	22.0	46.2	138	7.2	52.1	564	29.5	56.9
	Yes	221	14.4	23.3	199	13.0	85.0	68	4.4	73.9	489	31.9	53.8	127	8.3	47.9	427	27.9	43.1
Planting of root crop	No	679	33.9	71.5	118	5.9	50.4	63	3.1	68.5	542	27.0	59.6	133	6.6	50.2	470	23.4	47.4
	Yes	271	18.9	28.5	116	8.1	49.6	29	2.0	31.5	367	25.6	40.4	132	9.2	49.8	521	36.3	52.6
improved & drought resistant crop varieties	No	795	34.7	83.7	168	7.3	71.8	78	3.4	84.8	481	21.0	52.9	165	7.2	62.3	604	26.4	60.9
	Yes	155	13.5	16.3	66	5.7	28.2	14	1.2	15.2	428	37.2	47.1	100	8.7	37.7	387	33.7	39.1
Pulse crop production	No	899	31.1	94.6	211	7.3	90.2	84	2.9	91.3	602	20.8	66.2	230	8.0	86.8	865	29.9	87.3
	Yes	51	9.3	5.4	23	4.2	9.8	8	1.5	8.7	307	55.8	33.8	35	6.4	13.2	126	22.9	12.7
Tea and coffee planting	No	897	31.6	94.4	227	8.0	97.0	35	1.2	38.0	628	22.1	69.1	186	6.5	70.2	868	30.6	87.6
	Yes	53	8.8	5.6	7	1.2	3.0	57	9.5	62.0	281	46.8	30.9	79	13.2	29.8	123	20.5	12.4
Planting Cereals	No	123	12.6	12.9	177	18.1	75.6	51	5.2	55.4	472	48.3	51.9	63	6.4	23.8	91	9.3	9.2
	Yes	827	33.6	87.1	57	2.3	24.4	41	1.7	44.6	437	17.7	48.1	202	8.2	76.2	900	36.5	90.8

Source: 2021 RLLP beneficiary household questionnaire

3.5.14.6.2 Adoption of on-farm income generating activities across the Phases

Comparing the different phases, the adoption rate is higher in SLMP-II compared to both SLMP-I and New RLLP phases of the project. The average adoption rate of on-farm income generating activities among SLMP-II watersheds is 52.06%, while that of watersheds in SLMP-I is 37.32% and that of watersheds in New RLLP is 10.62%. Within the program phases, planting of trees for commercial purposes, Planting of root crop and Planting of improved & drought resistant crop varieties are the most commonly adopted on-farm income generating activities. The table below describes the adoption of on-farm income generating activities within and across the SLMP phases.

Table 57: Adoption of On-farm income generating across activities within and across the phases

On-farm income generating activities		Project phases								
		SLMP-I			SLMP-II			New RLLP		
		Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %
Trees for commercial purposes	No	692	42.4	49.4	770	47.2	46.1	169	10.4	45.8
	Yes	709	39.2	50.6	901	49.8	53.9	200	11.0	54.2
Planting of fruits	No	764	40.0	54.5	931	48.7	55.7	215	11.3	58.3
	Yes	637	41.6	45.5	740	48.3	44.3	154	10.1	41.7
Planting of root crop	No	873	43.5	62.3	933	46.5	55.8	199	9.9	53.9
	Yes	528	36.8	37.7	738	51.4	44.2	170	11.8	46.1
improved & drought resistant crop varieties	No	984	43.0	70.2	1068	46.6	63.9	239	10.4	64.8
	Yes	417	36.3	29.8	603	52.4	36.1	130	11.3	35.2
Pulse crop production	No	1198	41.4	85.5	1378	47.7	82.5	315	10.9	85.4
	Yes	203	36.9	14.5	293	53.3	17.5	54	9.8	14.6
Tea and coffee planting	No	1177	41.4	84.0	1345	47.3	80.5	319	11.2	86.4
	Yes	224	37.3	16.0	326	54.3	19.5	50	8.3	13.6
Planting Cereals	No	400	40.9	28.6	494	50.6	29.6	83	8.5	22.5
	Yes	1001	40.6	71.4	1177	47.8	70.4	286	11.6	77.5

Source: 2021 RLLP beneficiary household questionnaire

3.5.14.6.3 Adoption of on-farm income generating activities across the AEZs.

The adoption of on farm specific income generating activities varies across the different agro ecological zones. For example, the Planting of trees for commercial purposes and Planting of fruits (pineapples, Avocado, yellow banana, oranges, mangoes, lemons) are highly adopted in Weyena Dega, while the Planting of root crop (cassava, potatoes, carrots, yams, etc) and Planting of improved & drought resistant crop varieties are highly adopted in Dega and Upper Kolla as described in the table below.

Table 58: Adoption of on farm income generating activities across the AEZs.

On-farm income generating activities		Agro-ecological zone of the watershed								
		Dega			Upper Kolla			Weyena Dega		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Trees for commercial purposes	No	686	42.1	47.6	97	5.9	38.6	848	52.0	48.5
	Yes	755	41.7	52.4	154	8.5	61.4	901	49.8	51.5
Planting of fruits	No	854	44.7	59.3	49	2.6	19.5	1007	52.7	57.6
	Yes	587	38.3	40.7	202	13.2	80.5	742	48.5	42.4
Planting of root crop	No	778	38.8	54.0	144	7.2	57.4	1083	54.0	61.9
	Yes	663	46.2	46.0	107	7.5	42.6	666	46.4	38.1
improved & drought resistant crop varieties	No	966	42.2	67.0	191	8.3	76.1	1134	49.5	64.8
	Yes	475	41.3	33.0	60	5.2	23.9	615	53.5	35.2
Pulse crop production	No	1206	41.7	83.7	229	7.9	91.2	1456	50.4	83.2
	Yes	235	42.7	16.3	22	4.0	8.8	293	53.3	16.8
Tea and coffee planting	No	1244	43.8	86.3	191	6.7	76.1	1406	49.5	80.4
	Yes	197	32.8	13.7	60	10.0	23.9	343	57.2	19.6
Planting Cereals	No	355	36.3	24.6	176	18.0	70.1	446	45.6	25.5
	Yes	1086	44.1	75.4	75	3.0	29.9	1303	52.9	74.5

Source: 2021 RLLP beneficiary household questionnaire.

3.5.14.6.4 Adoption of on farm income generating activities by type of households.

The study discovered that Planting of fruits (pineapples, Avocado, yellow banana, oranges, mangoes, lemons) and Planting Cereals (wheat, rice, maize, oat, barley, rye, millet and sorghum) and oil seeds are the most commonly adopted on farm income generating activities within the female headed households. While the Planting of improved & drought resistant crop varieties and Planting of trees for commercial purposes are highly adopted among the Male headed households

Table 59: Household adoption of on farm income generating activities

On-farm income generating activities		Category of household					
		Female headed household			Male headed household		
		Count	Row %	Col %	Count	Row %	Col %
Trees for commercial purposes	No	476	29.2	48.0	1155	70.8	47.1
	Yes	515	28.5	52.0	1295	71.5	52.9
Planting of fruits	No	551	28.8	55.6	1359	71.2	55.5
	Yes	440	28.7	44.4	1091	71.3	44.5
Planting of root crop	No	607	30.3	61.3	1398	69.7	57.1
	Yes	384	26.7	38.7	1052	73.3	42.9
improved & drought resistant crop varieties	No	648	28.3	65.4	1643	71.7	67.1
	Yes	343	29.8	34.6	807	70.2	32.9
Pulse crop production	No	813	28.1	82.0	2078	71.9	84.8
	Yes	178	32.4	18.0	372	67.6	15.2
Tea and coffee planting	No	818	28.8	82.5	2023	71.2	82.6
	Yes	173	28.8	17.5	427	71.2	17.4
Planting Cereals	No	322	33.0	32.5	655	67.0	26.7
	Yes	669	27.2	67.5	1795	72.8	73.3

Source: 2021 RLLP beneficiary household questionnaire.

3.5.14.6.5 Adoption of on farm income generating activities by type of beneficiaries.

The adoption of on-farm income generating activities is high among both the direct and indirect beneficiaries. For instance, Planting Cereals (wheat, rice, maize, oat, barley, rye, millet and sorghum) and oil seeds is most commonly adopted on-farm income generating activities among the indirect beneficiaries while Planting of root crop (cassava, potatoes, carrots, yams, etc) and Planting of improved & drought resistant crop varieties are the most commonly adopted on farm income generating activities among the direct beneficiaries as described in the table below.

Table 60: Adoption of on-farm income generating activities by type of beneficiaries

On-farm income generating activities		Category of beneficiary					
		Direct beneficiary			Indirect beneficiary		
		Count	Row %	Col %	Count	Row %	Col %
Trees for commercial purposes	No	1428	87.6	46.7	203	12.4	52.6
	Yes	1627	89.9	53.3	183	10.1	47.4

Planting of	No	1692	88.6	55.4	218	11.4	56.5
fruits	Yes	1363	89.0	44.6	168	11.0	43.5
Planting of	No	1748	87.2	57.2	257	12.8	66.6
root crop	Yes	1307	91.0	42.8	129	9.0	33.4
improved	No	1989	86.8	65.1	302	13.2	78.2
varieties	Yes	1066	92.7	34.9	84	7.3	21.8
Pulse crop	No	2550	88.2	83.5	341	11.8	88.3
production	Yes	505	91.8	16.5	45	8.2	11.7
Tea and	No	2513	88.5	82.3	328	11.5	85.0
coffee	Yes	542	90.3	17.7	58	9.7	15.0
planting							
Planting	No	836	85.6	27.4	141	14.4	36.5
Cereals	Yes	2219	90.1	72.6	245	9.9	63.5

Source: 2021 RLLP beneficiary household questionnaire

3.5.14.6.6 Summary of adoption of the three major categories of income generating activities.

$$\text{HHs adopting } \textbf{on farm} \text{ activities} = \frac{\text{Findings of the study}}{\text{Total sample size}} \times \text{Target beneficiaries}$$

$$\text{HHs adopting } \textbf{on farm} \text{ activities} = \frac{3441}{3794} \times 173{,}326 = 157{,}199$$

$$\text{HHs adopting } \textbf{off farm} \text{ activities} = \frac{2702}{3794} \times 173{,}326 = 136738$$

$$\text{HHs adoptin n}\textbf{onfarm}\text{activities} = \frac{904}{3794} \times 173{,}326 = 45748$$

3.5.14.7 Adoption of **off farm** activities

3.5.14.7.1 Regional analysis

The different off -income generating activities have different adoption rates in line with the respective regions. Bee keeping is highly adopted in Oromia compared to the rest of the regions (44.7%), Poultry (41.1%) and Vermi-composting (52.0%) are highly adopted Amhara. Within the regions, different off farm income generating activities have different adoption rates. In Amhara for example, Sheep and goat fattening and Poultry are the most commonly adopted off-farm income generating activities. In Benshangul Gumuzi, Bee keeping and Sheep and goat fattening are the most commonly adopted off income generating income generating activities. In Gambela, Poultry and Sheep and goat fattening are the most commonly adopted off-farm income generating activities. In Oromia Sheep and goat fattening and Poultry are the most commonly adopted off-farm income generating income activities, just like it is within Sidama. The table below illustrates the rate of adoption of the different off-farm income generating activities within and across the region.

Table 61: Adoption of Off-farm income generating activities within and across the regions

Off-farm income generating activities		Region of the respondent																	
		Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Bee keeping	No	792	36.9	84.3	152	7.1	70.7	21	1.0	70.0	332	15.5	56.9	152	7.1	82.2	695	32.4	92.4
	Yes	148	26.4	15.7	63	11.2	29.3	9	1.6	30.0	251	44.7	43.1	33	5.9	17.8	57	10.2	7.6
Sheep and goat fattening	No	223	23.9	23.7	84	9.0	39.1	17	1.8	56.7	259	27.8	44.4	98	10.5	53.0	251	26.9	33.4
	Yes	717	40.4	76.3	131	7.4	60.9	13	.7	43.3	324	18.3	55.6	87	4.9	47.0	501	28.3	66.6
Poultry	No	254	24.5	27.0	141	13.6	65.6	12	1.2	40.0	262	25.3	44.9	66	6.4	35.7	302	29.1	40.2
	Yes	686	41.1	73.0	74	4.4	34.4	18	1.1	60.0	321	19.2	55.1	119	7.1	64.3	450	27.0	59.8
Fishery	No	937	34.8	99.7	214	8.0	99.5	30	1.1	100.0	576	21.4	98.8	185	6.9	100.0	747	27.8	99.3
	Yes	3	18.8	.3	1	6.3	.5	0	.0	.0	7	43.8	1.2	0	.0	.0	5	31.3	.7
Sericulture	No	928	35.7	98.7	207	8.0	96.3	29	1.1	96.7	502	19.3	86.1	185	7.1	100.0	748	28.8	99.5
	Yes	12	11.3	1.3	8	7.5	3.7	1	.9	3.3	81	76.4	13.9	0	.0	.0	4	3.8	.5
Vermin-composting	No	719	31.5	76.5	171	7.5	79.5	26	1.1	86.7	465	20.4	79.8	169	7.4	91.4	730	32.0	97.1
	Yes	221	52.0	23.5	44	10.4	20.5	4	.9	13.3	118	27.8	20.2	16	3.8	8.6	22	5.2	2.9

Source: 2021 RLLP beneficiary household questionnaire

3.5.14.7.2 Adoption of off-farm income generating activities within and across the phases of the program

The survey discovered that the adoption of bee keeping is high is Dega and Weyena Dega compared to the upper Kolla. The adoption of poultry and sheep and goat fattening are higher in upper kolla and Weyena Dega. Within each agro-ecological zone, Bee keeping, Sheep and goat fattening and Poultry are the most commonly adopted off-farm income generating activities. Fisheries is the least adopted off-farm income generating activities across and within the different agro-ecological zones. The table below describes the adoption of off farm income generating activities in detail within and across the AEZs

Table 62: Off-farm income generating activities across the AEZs

Off-farm income generating activities		Agro-ecological zone of the watershed								
		Dega			Upper Kolla,			Weyena Dega		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Bee keeping	No	941	43.9	77.2	114	5.3	65.1	1089	50.8	83.1
	Yes	278	49.6	22.8	61	10.9	34.9	222	39.6	16.9
Sheep and goat fattening	No	305	32.7	25.0	80	8.6	45.7	547	58.7	41.7
	Yes	914	51.6	75.0	95	5.4	54.3	764	43.1	58.3
Poultry	No	446	43.0	36.6	109	10.5	62.3	482	46.5	36.8
	Yes	773	46.3	63.4	66	4.0	37.7	829	49.7	63.2
Fishery	No	1211	45.0	99.3	174	6.5	99.4	1304	48.5	99.5
	Yes	8	50.0	.7	1	6.3	.6	7	43.8	.5
Sericulture	No	1173	45.1	96.2	168	6.5	96.0	1258	48.4	96.0
	Yes	46	43.4	3.8	7	6.6	4.0	53	50.0	4.0
Vermin-composting	No	1041	45.7	85.4	144	6.3	82.3	1095	48.0	83.5
	Yes	178	41.9	14.6	31	7.3	17.7	216	50.8	16.5

Source: 2021 RLLP beneficiary household questionnaire

3.5.14.7.3 Adoption of off-farm income generating activities disaggregated by the sex of the household head

Within the female headed households, the most commonly adopted off-farm income generating activities are Bee keeping, Sheep and goat fattening, Poultry. The least adopted off-farm income generating activities are Fishery, Sericulture and Vermin-composting. Among the male headed households, the most commonly adopted are Sheep and goat fattening, Bee keeping and Poultry. The average household adoption rate of off-farm income generating activities is 33.3% for both Male headed and female headed households. The table below describes the adoption of off-farm income generating activities disaggregated by household head.

Table 63: Adoption of off-farm income generating activities disaggregated by sex of HH head

Off-farm income generating activities		Category of household					
		Female headed household			Male headed household		
		Count	Row %	Col %	Count	Row %	Col %
Bee keeping	No	631	29.4	84.5	1513	70.6	77.3
	Yes	116	20.7	15.5	445	79.3	22.7
Sheep and goat fattening	No	231	24.8	30.9	701	75.2	35.8
	Yes	516	29.1	69.1	1257	70.9	64.2
Poultry	No	288	27.8	38.6	749	72.2	38.3
	Yes	459	27.5	61.4	1209	72.5	61.7
Fishery	No	740	27.5	99.1	1949	72.5	99.5
	Yes	7	43.8	.9	9	56.3	.5
Sericulture	No	712	27.4	95.3	1887	72.6	96.4
	Yes	35	33.0	4.7	71	67.0	3.6
Vermin-composting	No	628	27.5	84.1	1652	72.5	84.4
	Yes	119	28.0	15.9	306	72.0	15.6

Source: 2021 RLLP beneficiary household questionnaire

3.5.14.7.4 Adoption of off-farm income generating activities disaggregated by the category of beneficiaries

The rate of adoption of off-farm income generating activities was found to be high in direct beneficiaries and low among the indirect beneficiaries. Among the direct beneficiaries, Bee keeping, Sheep and goat fattening, Sericulture and Vermin-composting. The table below describes the adoption of off-farm income generating disaggregated by type of beneficiaries

Table 64: adoption of off-farm income generating activities disaggregated by type of beneficiaries

Off-farm income generating activities	category of beneficiary					
	Direct beneficiary			Indirect beneficiary		
	Count	Row %	Col %	Count	Row %	Col %

Bee keeping	No	1909	89.0	78.9	235	11.0	82.2
	Yes	510	90.9	21.1	51	9.1	17.8
Sheep and goat fattening	No	820	88.0	33.9	112	12.0	39.2
	Yes	1599	90.2	66.1	174	9.8	60.8
Poultry	No	914	88.1	37.8	123	11.9	43.0
	Yes	1505	90.2	62.2	163	9.8	57.0
Fishery	No	2407	89.5	99.5	282	10.5	98.6
	Yes	12	75.0	.5	4	25.0	1.4
Sericulture	No	2317	89.1	95.8	282	10.9	98.6
	Yes	102	96.2	4.2	4	3.8	1.4
Vermin-composting	No	2034	89.2	84.1	246	10.8	86.0
	Yes	385	90.6	15.9	40	9.4	14.0

Source: 2021 RLLP beneficiary household questionnaire

Off-farm income generating activities (Poultry in Gimbicu)

3.5.14.8 Adoption of **non-farm** activities

3.5.14.8.1 Regional analysis for the adoption of non-farm income generating activities.

The different non-income generating activities have different adoption rates in line with the respective regions. Amhara region however takes a lead in the adoption of Non-farm income generating activities, followed by Oromia, followed by SNNPR and the other regions follows. The table below illustrates the rate of adoption of the different Non-farm income generating activities across the region. The statistics indicate that Bamboo processing is commonly adopted in Benshangul Gumuzi and SNNPR. Cook Stove production and marketing is commonly adopted in Gambela and Amhara; Charcoal and Brewery are commonly adopted in SNNPR. The table below describes the adoption of non-farm income generating activities within and across the regions

Adoption of Non-farm income generating activities at a regional level.

		Region of the respondent																	
		Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR		
Non-farm income generating activities		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Bamboo processing	No	262	44.9	80.9	27	4.6	21.4	7	1.2	38.9	93	15.9	60.0	51	8.7	83.6	144	24.7	65.5
	Yes	62	19.4	19.1	99	30.9	78.6	11	3.4	61.1	62	19.4	40.0	10	3.1	16.4	76	23.8	34.5
Cook stove production	No	85	17.0	26.2	85	17.0	67.5	9	1.8	50.0	56	11.2	36.1	56	11.2	91.8	210	41.9	95.5
	Yes	239	59.3	73.8	41	10.2	32.5	9	2.2	50.0	99	24.6	63.9	5	1.2	8.2	10	2.5	4.5
Petty trade	No	296	42.3	91.4	122	17.5	96.8	11	1.6	61.1	136	19.5	87.7	21	3.0	34.4	113	16.2	51.4
	Yes	28	13.7	8.6	4	2.0	3.2	7	3.4	38.9	19	9.3	12.3	40	19.5	65.6	107	52.2	48.6
Masonry	No	319	38.0	98.5	120	14.3	95.2	16	1.9	88.9	124	14.8	80.0	57	6.8	93.4	204	24.3	92.7
	Yes	5	7.8	1.5	6	9.4	4.8	2	3.1	11.1	31	48.4	20.0	4	6.3	6.6	16	25.0	7.3
Charcoal	No	290	34.4	89.5	116	13.8	92.1	17	2.0	94.4	149	17.7	96.1	55	6.5	90.2	216	25.6	98.2
	Yes	34	55.7	10.5	10	16.4	7.9	1	1.6	5.6	6	9.8	3.9	6	9.8	9.8	4	6.6	1.8
Brewery	No	319	36.4	98.5	126	14.4	100.0	18	2.1	100.0	152	17.4	98.1	60	6.8	98.4	201	22.9	91.4
	Yes	5	17.9	1.5	0	.0	.0	0	.0	.0	3	10.7	1.9	1	3.6	1.6	19	67.9	8.6

Source: 2021 RLLP beneficiary household questionnaire

3.5.14.8.2 Adoption of non-farm income generating activities disaggregated by Phases of the Program.

The adoption of non-farm income generating activities is high among SLMP-II watersheds compared to the ones in SLMP-I and the New RLLP. Bamboo processing, cook stove production and Petty trade are the most commonly practiced non-farm income generating activities within and across the regions. The table below describes the adoption of non-farm income generating activities within and across the sustainable land management program phases.

Table 65: Adoption of non-farm income generating activities by phases

Non-farm income generating activities		Project phases								
		SLMP-I			SLMP-II			New RLLP		
		Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %
Bamboo processing	No	246	42.1	71.7	278	47.6	56.7	60	10.3	84.5
	Yes	97	30.3	28.3	212	66.2	43.3	11	3.4	15.5
Cook stove production	no	172	34.3	50.1	278	55.5	56.7	51	10.2	71.8
	yes	171	42.4	49.9	212	52.6	43.3	20	5.0	28.2
Petty trade	no	281	40.2	81.9	384	54.9	78.4	34	4.9	47.9
	yes	62	30.2	18.1	106	51.7	21.6	37	18.0	52.1
Masonry	no	328	39.0	95.6	445	53.0	90.8	67	8.0	94.4
	yes	15	23.4	4.4	45	70.3	9.2	4	6.2	5.6
Charcoal	no	330	39.1	96.2	447	53.0	91.2	66	7.8	93.0
	yes	13	21.3	3.8	43	70.5	8.8	5	8.2	7.0
Brewery	no	326	37.2	95.0	480	54.8	98.0	70	8.0	98.6
	yes	17	60.7	5.0	10	35.7	2.0	1	3.6	1.4

Source: 2021 RLLP beneficiary household questionnaire

3.5.14.8.3 Adoption of non-farm income generating activities across the AEZs.

The adoption of non-farm income generating activities is highly adopted in Dega, followed by Weyena Dega and then upper kola. Bamboo processing, cook stove production & Petty trade are the most common non-farm income generating activities adopted in all the AEZs. The table below describes in detail the adoption rate of non-farm income generating activities disaggregated according to AEZ.

Table 66 Adoption of Non-farm income generating activities disaggregated by AEZ

Non-farm income generating activities		Agro-ecological zone of the watershed								
		Dega			Upper Kolla			Weyena Dega		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Bamboo processing	No	266	45.5	71.3	28	4.8	25.7	290	49.7	68.7
	Yes	107	33.4	28.7	81	25.3	74.3	132	41.3	31.3
Cook stove production	No	181	36.1	48.5	69	13.8	63.3	251	50.1	59.5
	Yes	192	47.6	51.5	40	9.9	36.7	171	42.4	40.5

Petty trade	No	291	41.6	78.0	99	14.2	90.8	309	44.2	73.2
	Yes	82	40.0	22.0	10	4.9	9.2	113	55.1	26.8
Masonry	No	347	41.3	93.0	102	12.1	93.6	391	46.5	92.7
	Yes	26	40.6	7.0	7	10.9	6.4	31	48.4	7.3
Charcoal	No	347	41.2	93.0	100	11.9	91.7	396	47.0	93.8
	Yes	26	42.6	7.0	9	14.8	8.3	26	42.6	6.2
Brewery	No	364	41.6	97.6	109	12.4	100.0	403	46.0	95.5
	Yes	9	32.1	2.4	0	.0	.0	19	67.9	4.5

Source: 2021 RLLP beneficiary household questionnaire

3.5.14.8.4 Household adoption of the non-farm income generating activities.

The findings of the study indicate that Cook stove production and Petty trade the most commonly adopted non-farm income generating activities among female headed households. Bamboo processing and Masonry (building & construction) are highly adopted among the male headed households. The table below describes the adoption of non-farm income generating activities disaggregated by Sex of the household head.

Table 67: Adoption of Non-farm income generating activities at a household level

Non-farm income generating activities		Category of household					
		Female headed household			Male headed household		
		Count	Row %	Col %	Count	Row %	Col %
Bamboo processing	No	180	30.8	69.0	404	69.2	62.8
	Yes	81	25.3	31.0	239	74.7	37.2
Cook stove production	No	130	25.9	49.8	371	74.1	57.7
	Yes	131	32.5	50.2	272	67.5	42.3
Petty trade	No	198	28.3	75.9	501	71.7	77.9
	Yes	63	30.7	24.1	142	69.3	22.1
Masonry	No	237	28.2	90.8	603	71.8	93.8
	Yes	24	37.5	9.2	40	62.5	6.2
Charcoal	No	247	29.3	94.6	596	70.7	92.7
	Yes	14	23.0	5.4	47	77.0	7.3
Brewery	No	253	28.9	96.9	623	71.1	96.9
	Yes	8	28.6	3.1	20	71.4	3.1

Source: 2021 RLLP beneficiary household questionnaire

3.5.14.8.5 Adoption of non-farm income generating activities by type of beneficiary

Within the direct beneficiaries, cook stove production and charcoal are the most commonly adopted non-farm income generating activities; while bamboo processing and Brewery are the most commonly adopted non-farm income generating activities among the indirect beneficiaries as illustrated in the table below.

Table 68: Adoption of non-farm by type of beneficiaries

Non-farm income generating activities		Category of beneficiary							
		Direct beneficiary			Indirect beneficiary			Total	
		Count	Row %	Col %	Count	Row %	Col %	count	percent
Bamboo processing	No	519	88.9	65.1	65	11.1	60.7	584	64.6
	Yes	278	86.9	34.9	42	13.1	39.3	320	36.4
Cook stove production	No	430	85.8	54	71	14.2	66.4	501	55.4
	Yes	367	91.1	46	36	8.9	33.6	403	44.6
Petty trade	No	616	88.1	77.3	83	11.9	77.6	699	77.3
	Yes	181	88.3	22.7	24	11.7	22.4	205	22.7
Masonry	No	745	88.7	93.5	95	11.3	88.8	840	92.9
	Yes	52	81.3	6.5	12	18.8	11.2	64	7.1
Charcoal	No	741	87.9	93	102	12.1	95.3	843	93.3
	Yes	56	91.8	7	5	8.2	4.7	61	6.5
Brewery	No	774	88.4	97.1	102	11.6	95.3	876	96.9
	Yes	23	82.1	2.9	5	17.9	4.7	28	3.1

Source: 2021 RLLP beneficiary household questionnaire

3.5.14.8.6 Summary of adoption of the three categories of income generating activities

In summary the rate of adoption of on farm income generating activities is 87.7%; the one for off farm income generating activities is at 66.1, while the rate for adopting non-farm income generating activities was found to be at 23.1%. For the male headed households, the adoption rate for on-farm income generating activities is at 92, for off-farm income generating activities is 73.5% and the one for non-farm stands at 24.1% as illustrated in the table below.

Table 69: Summary of adoption of on-farm, off-farm and non-farm income generating activities

Nontraditional livelihood activities		Category of household					
		Female headed household			Male headed household		
		Count	Row %	Col %	Count	Row %	Col %
On-farm	No	139	39.4	12.3	214	60.6	8.0
	Yes	991	28.8	87.7	2450	71.2	92.0
Off-farm	No	383	35.2	33.9	706	64.8	26.5
	Yes	747	27.6	66.1	1958	72.4	73.5
Non-farm	No	869	30.1	76.9	2021	69.9	75.9
	Yes	261	28.9	23.1	643	71.1	24.1

Source: 2021 RLLP beneficiary household questionnaire

3.5.14.9 Case studies/success stories for adoption of nontraditional activities

Case Study-1: A model farmer who diversified livelihood activities and improved his standards of living as a result of RLLP in SNNPR.

My name is Bekele Herido, a local leader and a resident of Handosha watershed. My family comprises of 9 members (5 males and 3 females). All the 9 family members work as a group and we are undertaking on-farm and non-farm income generating activities We have been operating these on-farm income generating activities for the last seven (7) years. Our farming activities are carried out two (2) hectares of land.

We practice a number of on farm income generating activities which include: planting of false banana, coffee, Avocado, Maize, beans, cabbage, pawpaw, Desho grass, Taro, Barley, wheat mangoes, Eucalyptus and woodlot and other energy sources, poultry keeping and vermicomposting

Coffee plants

We have adopted a number of technologies on our farm land which include soil and water conservation technologies, water harvesting structures, improved pasture and forage development, planting and selling of grass for decoration, terracing and mulching.

Ato Mekonnen inspecting organic manure

Our annual average household incomes ranges between 80,000 to 90000 per year from agriculture. As a head of the family I have managed to take good care of all the family members including educating all the children, as well as improving the standards of living. (we started in a grass thatched house, we now have an iron roof house with electricity and other facilities like Television sets; we have also been able to construct

rooms for renting from the money obtained from the farming activities.

Main house before the adoption of diversified livelihood activities (7 years ago)

Main house after practicing livelihood diversified activities.

As a leader of the family, I have been invited in a number of Woredas and watersheds in SNNP to undertake experience sharing with other farmers on how to maximize output from a relatively small piece of land.

Woreda focal person, Joel Gumisiriza (Consultant & Ato Bekele-the model farmer)

Environmentally friendly forage development practices

False banana plantation

Ato Bekele and the two consultants (Denis Semakula & Joel Gumisiriza) on the farm land

Case Study-2: A case study for adoption of On-farm income generating activities

Mr Mohammod is a farmer living in Haramaya woreda of Oromia region of Ethiopia who was almost giving up on life because of his sole reliance on *khat* production for his livelihood. He relied on *khat* production and marketing through rainfed agriculture for his livelihood before the implementation of RLLP. After the introduction of RLLP, Mohammod started diversifying his livelihood sources by producing maize and make efficient use of his land by intercropping with his *khat* crop with the ultimate support he got from the project.

fig. *Mohammod at his farm yard.*

In addition, unlike other farmers supported by the project, Mohammod further started producing high quality and quantity of *Khat* and other crops by adopting water harvesting structures around his farmland. Moreover, this farmer has got mango seedlings from the project and has intercropped with maize and sorghum. With this, Mohammod is now able to harvest as many outputs as possible from each field and fruit crops with minimizing risk of sticking to mono-cropping system. Apart from this, he is producing other vegetables in his backyard with the harvested water to ensure that the household is food secure.

fig. *Khat intercropped with maize at Mohamood's plot.*

With the backing from the RLLP project, Mohammod was able to adopt legume intercropping in his maize field to improve soil fertility and thereby enhance his maize productivity. The beans were supposed to fix soil nitrogen to make easy access for the maize and mango plants which requires the nutrient most.

fig. *beans intercropped with maize and mangos*

fig. *a good-looking maize plant standing after intercropped with khat and legumes.*

3.1.1 Number of times including the years or months of practicing nontraditional income generating activities under the above-mentioned categories disaggregated by gender.

The assessment found out that different income generating activities have different gestation periods which eventually determine the number of times including years or months of practicing these nontraditional income generating activities. The table below illustrates the number of times of practicing nontraditional livelihood activities

Table 70: number of times for practicing nontraditional income generating activities

Nontraditional livelihood activities	Specific type of nontraditional livelihood activities	Examples of income generating activities	Gestation period		Number of times
			Male headed	Female headed	
On-farm income generating activities	Planting of trees for commercial purposes	Bamboo and other trees	Perennial (more than 12 months)	Perennial (more than 12 months)	Once a year
	Planting of fruits	Oranges, Pineapple, pawpaw, etc	Annual (12 months)	Annual (12 months)	Once a year
	Planting of root crop	Carrots, onions, garlic etc	Between 2-4 months	Between 2-4 months	4 times a year
	Planting of improved & drought resistant crop varieties	sorghum, cassava, sweet potato, pearl millet, cowpea and groundnut	Between 3-6 months	Between 3-6 months	Twice a year
	Pulse crop production	Legumes	Between 3-6 months	Between 3-6 months	Twice a year
	Tea and coffee planting	Tea & coffe	More than year	More than year	Twice a year once they start
Off-farm income generating activities	Bee keeping	Honey	Between 4-6 months	Between 4-6 months	Twice a year
	Sheep and goat fattening	Fattened goats & sheep	Between 3-12 months	Between 3-12 months	Twice a year
	Poultry	Eggs Chicken	Between 3-4 Months	Between 3-4 Months	Three times a year
	Fishery	Pond fish	6 Months	6 Months	Twice a year
	Sericulture	Silk worms	Between 3-8 days	Between 3-8 days	Weekly
	Vermin-composting	Pounds of waste	**Between 3-6 months**	**Between 3-6 months**	Twice a year
Non-farm income generating activities	Bamboo processing	Bamboo	Between 3-6 months	Between 3-6 months	3-4 times a year
	Cook stove production	Improved cook stove	5 days	5 days	Weekly

	Petty trade	Trade in general merchandize	Daily	Daily	Regularly
	Masonry	Construction works	Daily	Daily	Regularly
	Charcoal		1-3 months		3-times a week
	Brewery	Beer & alcoholic drink	Regularly	Regularly	Regularly

Source: FGD & KII guide

3.1.2 Groups of landless youth organized and issued with second level land certificate or other legal documentation to use communal land.

The findings of the survey showed that issuing of landless youth with second level land certificate or any other legal document is not something popular across the different regions. In some regions there is completely no single landless youth group that was issued with second level land certificate or any other legal document to use communal land. A total of 2253 youth groups are the ones who received second level certificate to use communal land. The table below illustrates the number of groups of landless youth issued with second level certificate or any legal right to use communal land.

Table 71: landless youth groups organized and issued with second level land certificate or other legal documentation to use communal land.

#	Region	Number of landless groups
1	Amhara	1091
2	Benshangul Gumuzi	73
3	Oromia	1089
4	Gambela	0
5	SNNPR	0
6	Sidama	0
Total		2253

Source: RLLP Annual reports.

3.1.3 Total numbers of landless youth group (sex disaggregated) who diversified their livelihoods as result of the approved livelihood activities supported by project support.

Table 72: Landless youth groups (sex disaggregated) who diversified their livelihood

#	Region	Number of landless groups		Total
		Male groups	Female groups	
1	Amhara	0	1019	1019
2	Benshangul Gumuzi	23	50	73
3	Oromia	692	397	1,089
4	Gambela	0	0	0
5	SNNPR	0	0	0
6	Sidama	0	0	0
Total		715	1466	2253

Source: RLLP Annual reports.

3.1.4 Household heads in the landless youth group (male headed and female headed) and individuals (non-household headed who are under the family) who diversify their livelihoods as result of the approved livelihood activities supported by project

		Region					
		Amhara	Benishangul Gumuz	Gambela	Oromia	Sidama	SNNPR
		Count	Count	Count	Count	Count	Count
Landless youth/heads engaged in diversification	No	459	214	76	316	0	218
	Yes	608	68	25	332	167	106
	Total	1067	282	101	1052	272	1020
Livelihood activities		**Total**					
On farm activities		792					
Off farm activities		663					
Non-farm activities		169					

Source: 2021 RLLP beneficiary household questionnaire

3.1.5 Total number of households adopting diversified livelihood activities supported by the project.

In an effort to strengthen community resilience through livelihood diversification, RLLP extended support for IGAs provided under SLMP-I to all RLLP watersheds, providing grants to CIGs for activities such as apiculture, poultry rearing, sheep and goat fattening, vegetable and fruit farming, and the production and marketing of improved cook stoves which help reduce pressure on watersheds' natural resources. The survey investigated the adoption of diversified livelihood diversification. Out of the 3794 respondents, it was discovered that 3399 were adopting diversified livelihood activities that were supported by the project. The total number of households adopting diversified livelihood activities was determined using the formula below that was derived from the general proportional formula in equation (2) in section 2.9.3 above.

$$\text{HHs adopting diversfied livelihoods} = \frac{\text{Findings of the study}}{\text{Total sample size}} \times \text{Target beneficiaries}$$

$$\text{HHs adopting household diversification} = \frac{3399}{3794} \times 173{,}326$$

The study discovered that a **total of 155,280** households adopted diversified livelihood activities supported by the project. This represents over 89% of the target project beneficiaries. The adoption of diversified livelihood activities basing on regions, phases, is comprehensively discussed in section 3.5.13 above

3.1.6 Total Female-headed households participating in diversified livelihood activities supported by the project.

The survey further investigated the total number of female-headed households participating in diversified livelihood activities. Out of the 1130 female headed households that participated in the survey, it was discovered that 991 had adopted diversified livelihood activities that were supported by the project. The findings of the study indicate that a total of 25,894 female households are participating in diversified livelihood activities determined by the formula below.

$$\text{HHs adopting diversfied livelihoods} = \frac{\text{Findings of the study}}{\text{Total sample size}} \times \text{Target beneficiaries}$$

$$\text{HHs adopting household diversification} = \frac{991}{1130} \times 29526$$

The adoption of diversified livelihood by female households is comprehensively discussed in section 3.2.9.

3.1.7 Beneficiaries linked to value chain actors

Agricultural value chain is simply **the people and activities that bring a basic agricultural product like maize or vegetables**, milk beef etc. from obtaining inputs and production in the field to the consumer, through stages such as processing, packaging, and distribution. The survey investigated members of CIGs (Male headed & female headed households as well as female farmers) who have been engaged in any of the value chain activities. The findings of the survey indicate that 48.5% of the sampled members of CIGs are engaged in at least one of the value chain activities

Table 73: Rate of participation in value chain activities

Participation in Value chain activities	Sex of the respondent								
	Female			Male			Total		
	Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %
No	181	41.8	55.0	252	58.2	49.2	433	100.0	51.5
Yes	148	36.3	45.0	260	63.7	50.8	408	100.0	48.5

Source: 2021 RLLP beneficiary household questionnaire

3.1.8 Sustainability of strategies of IGAs for improving the livelihoods of the beneficiaries

Note that sustainability strategy for income generating activities is the integration of economic, environmental and social aims into a business' goals, activities and planning, with the aim of creating long-term value for the firm, its stakeholders and wider society. This means that strategy is formulated and executed so that the needs of the firm and its stakeholders are met today, while protecting, sustaining and enhancing the natural resources that will be needed in the future. The assessment examined the different IGAs and observed that most of the IGAs in the different watersheds that were visited do not have sustainability strategies. The survey would therefore strongly recommend the introduction of the following strategies to the project beneficiaries through organizing seminars, trainings and awareness programs. These programs should focus on the identification of technological, social and organizational types, each able to support different sustainable strategy and the following aspects should be emphasized

The maximization of material and energy efficiency. This business model type seeks to do more with fewer resources, generating less waste, emissions and pollution. In this way, it has links with eco-efficiency initiatives.

Business models that create **value from waste** can reduce pollution and reduce costs in the production process; wastes are often seen as undesirable, and so if a business model and

accompanying strategy are able to use these inputs, they are often at lower cost and help reduce wastes that need processing or dumping into the environment.

Substitute with renewables and natural processes-these business models reduce environmental impacts and increase organizational resilience by reducing reliance on finite or hard to get inputs. Socially orientated sustainable business models cover the next three types. These include

Functionality rather than ownership. These business models satisfy users' needs without the users having to own the physical products. This enables organizations to ensure that machinery and capital is used in an optimal way, while they are also better able to manage material flows – helping to decuple growth from material use, in turn helping to facilitate sustainable growth. For instance, think of a car – your car is likely to sit idle in your garage for the majority of the time, while with a functionality business model, it can be used more ensuring its relative embodied environmental impact is reduced.

Adopt a stewardship role business models involve proactively engaging with stakeholders to ensure their long-term health and well-being; stewardship and certification schemes are good examples of this type of approach, where organizations are accredited as to their efforts at long-term care of a resource or community.

Encouraging sufficiency: These business models actively seek to reduce consumption and production, often through demand and supply side effects. For instance, energy service companies encourage consumers to reduce energy use. This would usually reduce revenue for the energy provider. However, with innovative contracts or government support, these organizations are able to benefit by reducing overall energy consumption.

Repurposing for society or the environment, such as prioritizing social or environmental value creation, over economic profit. This is often achieved by aligning with and integrating local communities and stakeholders into the organization.

The development of scale up solutions, which involves ensuring that effective local solutions can be scaled to enhance impact

3.1.9 Adoption rate of the non-traditional income generating activities.

The survey examined the adoption rate of the non-traditional income generating activities under the three categories of on farm, off farm and non-farm in the targeted community either through project support and prior to project support.

The findings of the study indicate that there has been a significant increase in the adoption of both on-farm and non-farm income generating activities among both male and female headed households. For example, the rate of adoption of on-farm income generating activities was28.3% before the implementation of RLLP, while it was found to be 38.1% an increase of over 10% among female headed households; the rate of adoption of on-farm income generating among male headed households rose from 22.7% to 33.6%; The table below shows the difference in the rates of adoption of income generating activities among the households

Table 74: Change in the adoption of nontraditional income generating activities as a result of RLLP

Nontraditional Income generating activities		Category of household					
		Female headed household			Male headed household		
		Count	Row N %	Column N %	Count	Row N %	Column N %
On farm before	No	806	28.1	71.3	2058	71.9	77.3
RLLP	Yes	324	34.8	28.7	606	65.2	22.7
On farm after	No	699	28.3	61.9	1769	71.7	66.4
RLLP	Yes	431	32.5	38.1	895	67.5	33.6
Non-farm	No	980	28.8	86.7	2419	71.2	90.8
before RLLP	Yes	150	38.0	13.3	245	62.0	9.2
Non-farm after	No	247	28.2	21.9	629	71.8	23.6
RLLP	Yes	883	30.3	78.1	2035	69.7	76.4
Off-farm before	No	621	29.5	55.0	1484	70.5	55.7
RLLP	Yes	509	30.1	45.0	1180	69.9	44.3
Off-farm after	No	637	27.8	56.4	1658	72.2	62.2
RLLP	Yes	493	32.9	43.6	1006	67.1	37.8

Source: 2021 RLLP beneficiary household questionnaire

3.1.10 Difference in the adoption of the non-traditional income generating activities

A two-sided test with significance level .05. was performed to establish whether there is a significant difference in the adoption of the three types of non-traditional income generating activities across the regions. Note that for each significant pair, the key of the category with the smaller column proportion appears under the category with the larger column proportion. Tests are adjusted for all pairwise comparisons within a row of each innermost sub table using the Bonferroni correction.

Table 75 Comparisons of Column Proportions

		Region of the respondent					
		Amhara	Benishangul Gumuz	Gambela	Oromia	Sidama	SNNPR
		(A)	(B)	(C)	(D)	(E)	(F)
Adopted on-farm income generating activities promoted by RLLP	No	E F	E F	F	E F		
	Yes					A B D	A B C D
Adopted modern Off-farm income generating activities	No		A	A B D E F	A B E F	A	A
	Yes	B C D E F	C D		C	C D	C D
Adopted Non-Farm income generating activities	No	B		B	A B E F	B	A B
	Yes	D F	A C D E F			D	D

Source: 2021 RLLP beneficiary household questionnaire

From the table above, the adoption of on farm income generating in Sidima is significantly different from the ones of Amhara (A), Benshangul Gumuzi (B) and Oromia (D). While the rate of adoption of on-farm income generating activities in SNNPR is significantly higher compared to the ones of Amhara, Benshangul Gumuz, Gambela and Oromia. The rate of adopting off-farm income generating activities is significantly higher in Amhara compared to the other five regions (Benshangul, Gambela, Oromia, Sidama and SNNPR); and the rate of adoption of Non-farm income generating activities is siginificantly higher in Gambela, compared to the ones in the other five regions of Amhara, Benshangul Gumuz, Oromia, Sidama and SNNPR.

3.1.11 Difference in the adoption of Non-traditional income generating activities by Sex of the household head

A two-sided test with significance level .05. was performed to establish whether there is a significant difference in the adoption of the three types of non-traditional income generating activities between the male and female headed households. The findings of the test shows that rate of adoption of both on farm and off farm income generating activities is significantly higher in male headed households compared to the female headed households. The test further revealed no significant difference in the rate of adoption of off farm income generating activities between female and male headed households.

Difference in adoption of nontraditional income generating activities by household heads

Specific non-traditional income generating activities		Category of household	
		Female headed households (A)	Male headed households (B)
Adoption of on-farm income generating activities	No	B	
	Yes		A
Adoption of modern Off-farm income generating activities	No	B	
	Yes		A
Adoption of Non-Farm income generating activities.	No		
	Yes		

Source: 2021 RLLP beneficiary household questionnaire

3.1.12 Summary of the impact of RLLP on ecosystem resilience.

The back of the project indicate that smallholder farming is the primary economic activity across the six regions where RLLP is being implemented. Farming used to take place in often highly degraded and vulnerable environments where there is substantial loss of vegetation, associated erosion and declining soil fertility. Rapidly growing populations and the associated demand for biomass fuels, water, and agricultural land accelerate environmental degradation and further threaten food production. The adoption of CSA, SWC, ISFM, crop diversity, environmentally forage friendly development practices sustainable land management practices and other interventions such as agroforestry have created a tremendous impact on improving climate resilience. These can be evidenced by the increase in crop production and productivity, improved food security, incomes and welfare of the people in watersheds where RLLP is being implemented.

3.2 Beneficiary Satisfaction Survey

3.2.1 Composite beneficiary household's satisfaction index also known as (CBSI).

The composite beneficiary satisfaction index (CBSI) is the percentage of all the positive responses received during the survey. This study considered all respondents that reported either satisfied or extremely satisfied as positive responses and expressed this as a percentage of the total household respondents. The formula below illustrates how the CBSI was computed. In the same token, we attempted to capture if the beneficiary satisfaction differs across regions and phases of the program. Moreover, the CBSI was also developed for the three agro-ecology in attempt to unearth if the beneficiary satisfaction varies by agro-ecology and how good the program implementation and intervention activities have addressed the needs and priorities of households residing in those areas. As a result, the following formula was used to calculate the satisfaction index as stipulated in the PAD accordingly.

$$CBSI = \frac{Number\ of\ positive\ repondents\ (Satisfied + extremely\ satisfied)}{Total\ number\ of\ houselds\ in\ the\ survey} X100$$

$$CBSI = \frac{3387}{3794} X100 = 89.3\%$$

This suggests 89.27% of the respondents surveyed were either satisfied or extremely satisfied with at least one or more of the project components activities. More importantly, households are very indebted to the program and are extremely satisfied with SWC activities and the measures taken for rehabilitating degraded lands. The remaining 10.73% of the respondents are in the other end of the satisfaction continuum.

Table 76: Satisfaction level across the phases of the project

				SLMP		Total
			RLLP	SLMP-I	SLMP-II	
Respondents' level of satisfaction for the project related activities	Dissatisfied	Count	8	55	30	93
		% of Total	0.2%	1.4%	0.8%	2.5%
	Extremely dissatisfied	Count	17	17	41	75
		% of Total	0.4%	0.4%	1.1%	2.0%
	Extremely satisfied	Count	127	435	668	1230
		% of Total	3.3%	11.5%	17.6%	32.4%
	Neither satisfied nor dissatisfied	Count	34	125	80	239
		% of Total	0.9%	3.3%	2.1%	6.3%
	Satisfied	Count	212	906	1039	2157

		% of Total	5.6%	23.9%	27.4%	56.9%
Total		Count	398	1538	1858	3794
		% of Total	10.5%	40.5%	49.0%	100.0%

Source: 2021 RLLP beneficiary household questionnaire

$$CBSI_{SLMP-I} = \frac{Number\ of\ positive\ repondents\ \ in\ SLMP-I(Satisfied + extremely\ satisfied)}{Total\ number\ of\ houselds\ in\ the\ surveyed\ in\ SLMP-I} * 100\%$$

$$CBSI_{SLMP-I} = \frac{1341}{1538} X100\% = 87.19\%$$

$$CBSI_{SLMP-II} = \frac{Number\ of\ positive\ repondents\ \ in\ SLMP-II(Satisfied + extremely\ satisfied)}{Total\ number\ of\ houselds\ in\ the\ surveyed\ in\ SLMP-II} * 100\%$$

$$CBSI_{SLMP-II} = \frac{1707}{1858} * 100\% = 91.87\%$$

$$CBSI_{RLLP} = \frac{Number\ of\ positive\ repondents\ \ in\ RLLP(Satisfied + extremely\ satisfied)}{Total\ number\ of\ houselds\ in\ the\ surveyed\ in\ RLLP} * 100\%$$

$$CBSI_{RLLP} = \frac{339}{398} * 100\% = 85.18\%$$

Based on these figures, the SLMP-II has been more satisfying than its earlier phase. It means the program implementing partners have learnt lessons from the first phase of the implementation. While the RLLP (the 3rd phase of SLMP) was expected to be more beneficial to the households, it's found to be less satisfying because it's at its infancy stage of the implementation coupled by the substantial effect of Covid-19 on people's movement and gatherings during the last couple of months.

3.2.1.1 Composite beneficiary household's satisfaction index (CBSI) segregated by Agro-ecological Zones.

Table 77: Satisfaction levels in the agroecological zones

			Agro-ecological zone of the watershed			Total
			Dega	Upper Kolla	Weyena Dega	
Respondents' level of satisfaction on the project	Dissatisfied	Count	22	19	52	93
		% within Agro-ecological zone of the watershed	1.4	6.5	2.8	2.5
		% of Total	0.6	0.5	1.4	2.5
	Extremely dissatisfied	Count	33	15	27	75

related activities		% within Agro-ecological zone of the watershed	2.0	5.1	1.4	2.0
		% of Total	0.9	0.4	0.7	2.0
		Count	622	13	595	1230
	Extremely satisfied	% within Agro-ecological zone of the watershed	38.5	4.4	31.6	32.4
		% of Total	16.4	0.3	15.7	32.4
		Count	96	53	90	239
	Neither satisfied nor dissatisfied	% within Agro-ecological zone of the watershed	5.9	18.0	4.8	6.3
		% of Total	2.5	1.4	2.4	6.3
		Count	842	194	1121	2157
	Satisfied	% within Agro-ecological zone of the watershed	52.1	66.0	59.5	56.9
		% of Total	22.2	5.1	29.5	56.9
		Count	1615	294	1885	3794
Total		% within Agro-ecological zone of the watershed	100.0	100.0	100.0	100.0
		% of Total	42.6	7.7	49.7	100.0

Source: 2021 RLLP beneficiary household questionnaire

$$CBSI_{Dega} = \frac{Number\ of\ positive\ repondents\ \ in\ Dega\ (Satisfied + extremely\ satisfied)}{Total\ number\ of\ houselds\ in\ the\ surveyed\ in\ Dega} * 100\%$$

$$CBSI_{Dega} = \frac{1464}{1615} * 100\% = 90.6\%$$

$$CBSI_{Upper\ Kolla} = \frac{Number\ of\ positive\ repondents\ \ in\ Upper\ Kolla\ (Satisfied + extremely\ satisfied)}{Total\ number\ of\ houselds\ in\ the\ surveyed\ in\ Upper\ Kolla} * 100\%$$

$$CBSI_{Upper\ Kolla} = \frac{207}{294} * 100\% = 70.4\%$$

$$CBSI_{Woyna\ Dega} = \frac{Number\ of\ positive\ repondents\ \ in\ Woyna\ Dega\ (Satisfied + extremely\ satisfied)}{Total\ number\ of\ houselds\ in\ the\ surveyed\ in\ Woyna\ Dega} * 100\%$$

$$CBSI_{Woyna\ Dega} = \frac{1716}{1885} * 100\% = 91.1\%$$

Satisfaction levels are high in both Weyena Dega and Dega compared to upper kola as indicated in the composite beneficiary satisfaction indices above.This is because Dega and Weyena Dega are highly susceptible soil erosion, land degradation, climate variability and farming risk. Because of the visible impact of sustainable land management practices, soil and water conservation technologies, integrated soil fertility management practices, climate smart agriculture practices and others technologies and approaches on land restoration, reduction in soil erosion improving soil fertility and productivity, it is not surprising that the satisfaction levels are high in Weyena Dega and Dega.

3.2.1.2 Composite beneficiary household's satisfaction index (CBSI) segregated by Region.

			Region						Total
			Amhara	Benishangul Gumuz	Gambela	Oromia	Sidama	SNNPR	
Respondents' level of satisfaction for the project related activities)	Dissatisfied	Count	33	29	2	9	6	14	93
		% within Region	3.1	10.3	2.0	0.9	2.2	1.4	2.5
		% of Total	0.9	0.8	0.1	0.2	0.2	0.4	2.5
	Extremely dissatisfied	Count	48	18	0	5	3	1	75
		% within Region	4.5	6.4	0.0	0.5	1.1	0.1	2.0
		% of Total	1.3	0.5	0.0	0.1	0.1	0.0	2.0
	Extremely satisfied	Count	368	8	9	319	103	423	1230
		% within Region	34.5	2.8	8.9	30.3	37.9	41.5	32.4
		% of Total	9.7	0.2	0.2	8.4	2.7	11.1	32.4
	Neither satisfied nor dissatisfied	Count	74	56	14	62	7	26	239
		% within Region	6.9	19.9	13.9	5.9	2.6	2.5	6.3
		% of Total	2.0	1.5	0.4	1.6	0.2	0.7	6.3
	Satisfied	Count	544	171	76	657	153	556	2157
		% within Region	51.0	60.6	75.2	62.5	56.2	54.5	56.9
		% of Total	14.3	4.5	2.0	17.3	4.0	14.7	56.9
Total		Count	1067	282	101	1052	272	1020	3794
		% within Region	100.0	100.0	100.0	100.0	100.0	100.0	100.0
		% of Total	28.1	7.4	2.7	27.7	7.2	26.9	100.0

Source: 2021 RLLP beneficiary household questionnaire

$$CBSI_{Amhara} = \frac{Number\ of\ positive\ repondents\ \ in\ Amhara\ (Satisfied + extremely\ satisfied)}{Total\ number\ of\ houselds\ in\ the\ surveyed\ in\ Amhara} * 100\%$$

$$CBSI_{Amhara} = \frac{912}{1067} * 100\% = 87\%$$

$$CBSI_{Benishangul} = \frac{Number\ of\ positive\ repondents\ \ in\ Benishangul\ (Satisfied + extremely\ satisfied)}{Total\ number\ of\ houselds\ in\ the\ surveyed\ in\ Benishangul} * 100\%$$

$$CBSI_{Benishangul} = \frac{179}{284} * 100\% = 61.4\%$$

$$CBSI_{Gambella} = \frac{Number\ of\ positive\ repondents\ \ in\ Gambella\ (Satisfied + extremely\ satisfied)}{Total\ number\ of\ houselds\ in\ the\ surveyed\ in\ Gambella} * 100\%$$

$$CBSI_{Gambella} = \frac{85}{101} * 100\% = 84.1\%$$

$$CBSI_{Oromia} = \frac{Number\ of\ positive\ repondents\ \ in\ Oromia\ (Satisfied + extremely\ satisfied)}{Total\ number\ of\ houselds\ in\ the\ surveyed\ in\ Oromia} * 100\%$$

$$CBSI_{Oromia} = \frac{976}{1052} * 100\% = 92.8\%$$

$$CBSI_{Sidama} = \frac{Number\ of\ positive\ repondents\ \ in\ Sidama\ (Satisfied + extremely\ satisfied)}{Total\ number\ of\ houselds\ in\ the\ surveyed\ in\ Sidama} * 100\%$$

$$CBSI_{Sidama} = \frac{256}{272} * 100\% = 94.1\%$$

$$CBSI_{SNNPR} = \frac{Number\ of\ positive\ repondents\ \ in\ SNNPR\ (Satisfied + extremely\ satisfied)}{Total\ number\ of\ houselds\ in\ the\ surveyed\ in\ Sidama} * 100\%$$

$$CBSI_{SNPPR} = \frac{979}{1020} * 100\% = 96\%$$

Across the regions, SNNPR had the highest level of project satisfaction by respondents; while Sidama and Oromia take the next to ranks respectively. The Benishangul Gumuz region is where the lowest satisfaction rate amongst sample respondents was observed. In this region, we found that communal land certificates weren't given to any member of the youth; there is abundant idle land resource for cultivation which can benefit the entire section of the community.

3.2.1.3 CBSI disaggregated by Sex of household head

			Agro-ecological zone of the watershed:		
			Household head		Total
			Female headed household	Male headed household	
Respondents' level of satisfaction for the project related activities	Dissatisfied	Count	32	61	93
		% within	2.8	2.3	2.5
		% of Total	0.8	1.6	2.5
		Count	25	50	75

	Extremely dissatisfied	% within	2.2	1.9	2.0
		% of Total	0.7	1.3	2.0
	Extremely satisfied	Count	315	915	1230
		% within	27.9	34.3	32.4
		% of Total	8.3	24.1	32.4
	Neither satisfied nor dissatisfied	Count	85	154	239
		% within	7.5	5.8	6.3
		% of Total	2.2	4.1	6.3
	Satisfied	Count	673	1484	2157
		% within	59.6	55.7	56.9
		% of Total	17.7	39.1	56.9
Total		Count	1130	2664	3794
		% within	100.0	100.0	100.0
		% of Total	29.8	70.2	100.0

Source: 2021 RLLP beneficiary household questionnaire

$$CBSI_{Female\ Headed} = \frac{Number\ of\ positive\ repondents\ \ in\ Female\ Headed\ (Satisfied + extremely\ satisfied)}{Total\ number\ of\ houselds\ in\ the\ surveyed\ in\ Female\ Headed} * 100\%$$

$$CBSI_{Female\ Headed} = \frac{988}{1130} * 100\% = 84.8\%$$

$$CBSI_{Male\ Headed} = \frac{Number\ of\ positive\ repondents\ \ in\ Male\ Headed\ (Satisfied + extremely\ satisfied)}{Total\ number\ of\ houselds\ in\ the\ surveyed\ in\ Male\ Headed} * 100\%$$

$$CBSI_{Male\ Headed} = \frac{2399}{2664} * 100\% = 89.3\%$$

Table 78: beneficiary household's satisfaction index (CBSI) segregated by Sex

			Household head		Total
			Female headed household	Male headed household	
Respondents' level of satisfaction for the project related activities	Dissatisfied	Count	32	61	93
		% within	2.8	2.3	2.5
		% of Total	0.8	1.6	2.5
	Extremely dissatisfied	Count	25	50	75
		% within	2.2	1.9	2.0
		% of Total	0.7	1.3	2.0
	Extremely satisfied	Count	315	915	1230
		% within	27.9	34.3	32.4
		% of Total	8.3	24.1	32.4
		Count	85	154	239

Neither satisfied nor dissatisfied	% within	7.5	5.8	6.3
	% of Total	2.2	4.1	6.3
	Count	673	1484	2157
Satisfied	% within	59.6	55.7	56.9
	% of Total	17.7	39.1	56.9
	Count	1130	2664	3794
Total	% within	100.0	100.0	100.0
	% of Total	29.8	70.2	100.0

Source: 2021 RLLP beneficiary household questionnaire

$$\text{CBSI}_{\text{Female Headed}} = \frac{\text{Number of positive repondents in Female Headed (Satisfied + extremely satisfied)}}{\text{Total number of houselds in the surveyed in Female Headed}} * 100\%$$

$$\text{CBSI}_{\text{Female Headed}} = \frac{988}{1130} * 100\% = 84.8\%$$

$$\text{CBSI}_{\text{Male Headed}} = \frac{\text{Number of positive repondents in Male Headed (Satisfied + extremely satisfied)}}{\text{Total number of houselds in the surveyed in Male Headed}} * 100\%$$

$$\text{CBSI}_{\text{Male Headed}} = \frac{2399}{2664} * 100\% = 89.3\%$$

3.2.1.4 Satisfaction index (CBSI) for women in male headed households.

Table 79: Satisfaction levels of women

Level of satisfaction		Project Phases			Total
		RLLP	SLMP-I	SLMP-II	
Dissatisfied	Count	10	9	3	22
	% within	45.5	40.9	13.6	100.0
	% within SLMP	7.5	7.4	3.4	6.4
	% of Total	2.9	2.6	0.9	6.4
Extremely dissatisfied	Count	9	1	2	12
	% within	75.0	8.3	16.7	100.0
	% within SLMP	6.8	0.8	2.3	3.5
	% of Total	2.6	0.3	0.6	3.5
Extremely satisfied	Count	33	49	37	119
	% within	27.7	41.2	31.1	100.0
	% within SLMP	24.8	40.2	42.5	34.8
	% of Total	9.6	14.3	10.8	34.8
Neither satisfied nor dissatisfied	Count	10	6	1	17
	% within	58.8	35.3	5.9	100.0

	% within SLMP	7.5	4.9	1.1	5.0
	% of Total	2.9	1.8	0.3	5.0
Satisfied	Count	71	57	44	172
	% within	41.3	33.1	25.6	100.0
	% within SLMP	53.4	46.7	50.6	50.3
	% of Total	20.8	16.7	12.9	50.3
Total	Count	133	122	87	342
	% within	38.9	35.7	25.4	100.0
	% within SLMP	100.0	100.0	100.0	100.0
	% of Total	38.9	35.7	25.4	100.0

Source: 2021 RLLP beneficiary household questionnaire

The findings of the survey indicate that 95.6% of women in male headed households are satisfied or more with the project activities. The level of satisfaction for women in male headed households is higher than that in female headed households or male heads households either. This is an indication that project interventions have empowered women as far as livelihood diversification is concerned.

3.2.1.5 Test statistics for satisfaction levels (Male headed vs female headed households)

The test statistics below shows that satisfaction level of male headed households on the RLLP project work was found to be statistically significantly higher than female headed households.

Table 80: T-statistics for satisfaction levels between male and female headed households

Item	Category of household heads	N	Mean Rank	Sum of Ranks
How satisfied are you that the project activities associated with RLLP are useful to you?	Female headed household	1130	1797.30	2030954.50
	Male headed household	2664	1940.00	5168160.50
	Total	3794		

Test Statistics	How satisfied are you that the project activities associated with RLLP are useful to you?
Mann-Whitney U	1391939.500
Asymp. Sig. (2-tailed)	.000
a. Grouping Variable: Category of household heads	

(U = 1391939.5, p < 0.001).

Source: 2021 RLLP beneficiary household questionnaire

3.2.1.6 Difference in the satisfaction levels across the regions

This was tested using A Kruskal-Wallis H test. The results of the test showed that there is a statistically significant difference in satisfaction of beneficiaries on the RLLP project work among the different regions, $\chi 2(5) = 301.278$, $p < 0.001$, with a mean rank satisfaction level of 2137.63 for SNNP, 2050.40 for Sidama, 1910.37 for Oromia, 1879.66 for Amhara, 1443.84 for Gambela and 1063.45 for Benishangul Gumuz regions.

Table 81: Kruskal-Wallis H test (Difference in satisfaction levels across the regions)

	Region of the respondent	N	Mean Rank
How satisfied are you that the project activities associated with RLLP are useful to you?	Gambela	101	1443.84
	Benishangul Gumuz	282	1063.45
	Amhara	1067	1879.66
	Oromia	1052	1910.37
	Sidama	272	2050.40
	SNNPR	1020	2137.63
	Total	3794	

Test Statistics	How satisfied are you that the project activities associated with RLLP are useful to you?
Chi-Square	301.278
df	5
Asymp. Sig.	.000

a. Kruskal Wallis Test

b. Grouping Variable: Region of the respondent

Source: 2021 RLLP beneficiary household questionnaire

3.2.2 The quality of service delivery as perceived by the project beneficiary households;

Respondents were asked to rate the quality of services provided by the RLLP project interventions. The rating was based on the five SERVQUAL attributes (tangibility, reliability, responsiveness, assurance, empathy). The findings below illustrate how the beneficiaries rated the quality of services offered by the RLLP project

3.2.2.1 Non-traditional livelihood activities

Table 82: Rating of nontraditional livelihood activities

Activities	Service quality attributes				
	Tangibility	Reliability	Responsiveness	Assurance	Empathy
On farm Activities	1552	1039	630	181	282
Off farm Activities	1185	971	547	135	221
Non-farm Activities	647	469	367	92	157

Source: 2021 RLLP beneficiary household questionnaire

3.2.2.2 Quality of services offered in the bid to adopt the different technologies.

Table 83: Rating the quality of services offered to adopt technologies

Activities	Service quality attributes				
	Tangibility	Reliability	Responsiveness	Assurance.	Empathy
SWC Activities	982	782	460	144	214
CSA Activities	692	556	273	106	127
SLM Practices	811	582	465	127	141
ISFM Activities	776	588	375	136	159
CG Services	285	163	118	23	41
Farm water & moisture management Practices	342	233	198	73	83
WIC Services	174	86	72	22	32

Source: 2021 RLLP beneficiary household questionnaire

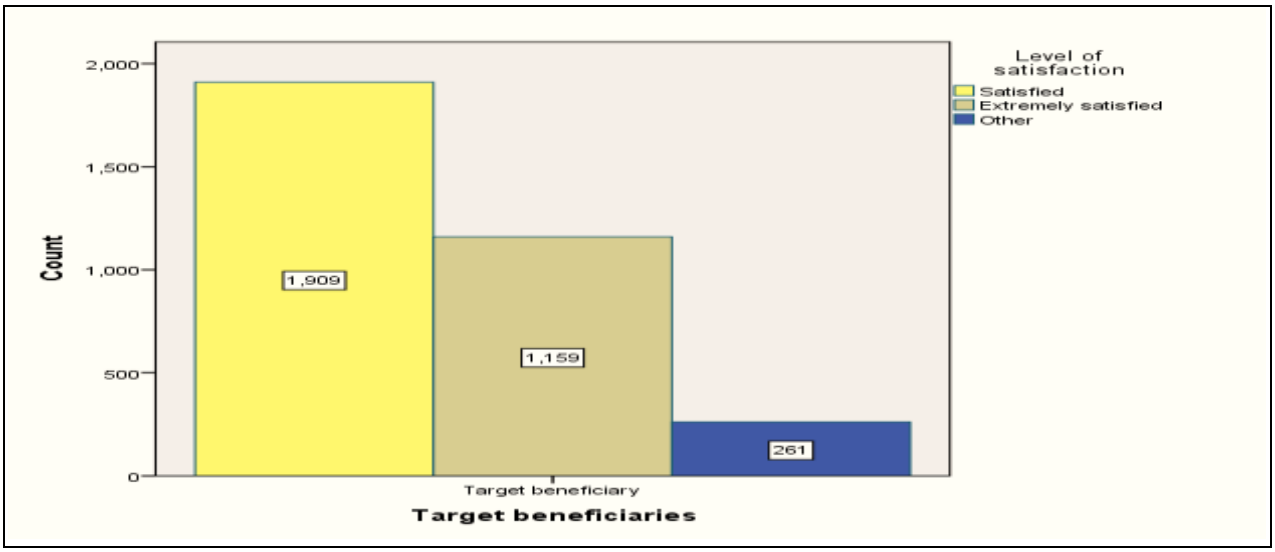
As it depicted in the above table, all major project component activities are more tangible than other service quality attributes. The likely that a tangible project component to be reliable is high as it would be responsive as well. In other lyrics, tangibility, reliability and responsiveness are the common service quality attributes that characterizes all project supported activities. Usually assurance and empathy are the service qualities less often attributed to the project activities carried out so far.

3.2.3 Share of target beneficiaries with rating 'Satisfied' or above on project interventions (aspects: livelihoods, environmental benefits, others)

The findings of the study indicate that 34.8% of the target beneficiaries are extremely satisfied while 57.3% are satisfied with the project interventions. Therefore 92.1% beneficiaries rated the

project intervention satisfied or above satisfied. Figure below illustrates the satisfaction levels for project beneficiaries about the RLLP interventions.

Figure 4: Share of target beneficiaries with ratings satisfied or extremely satisfied

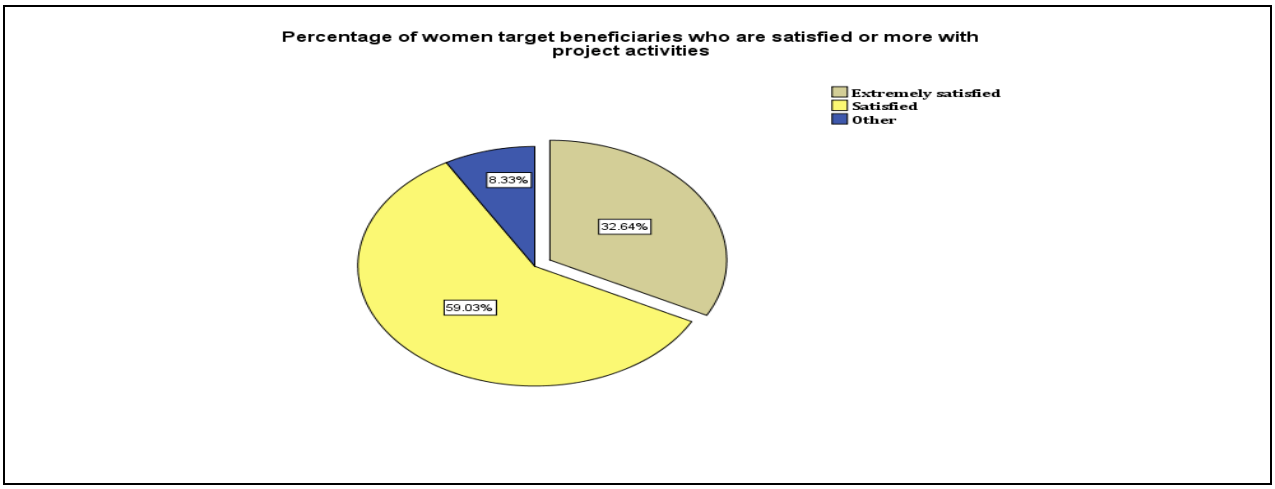


Source: 2021 RLLP beneficiary household questionnaire

3.2.4 Share of target women beneficiaries with rating 'Satisfied' or above on project interventions

From the chart below, it is possible to easily unearth that 91.67% of women beneficiaries are satisfied or more than satisfied. In this analysis we considered both women in female headed households and the wives of male headed households. This is a good indication for a program that is set from the inception to reduce the gender gap in terms of being benefited from implementation and this is what it has done so far. Those sources of dissatisfaction for the trivial number of respondents who are dissatisfied or lower is the selection process to get the livelihood activities support from the program as well as the incompleteness of the packages of livelihood activities which sometimes led women to fail to operate in the business. In fact, the wage paid for women for participating in SWC activities is low enough that in some places it is even below 10 per cent of the wage that a typical daily agricultural laborer is usually paid-off.

Figure 5: Share of women beneficiaries with rating satisfied or extremely satisfied

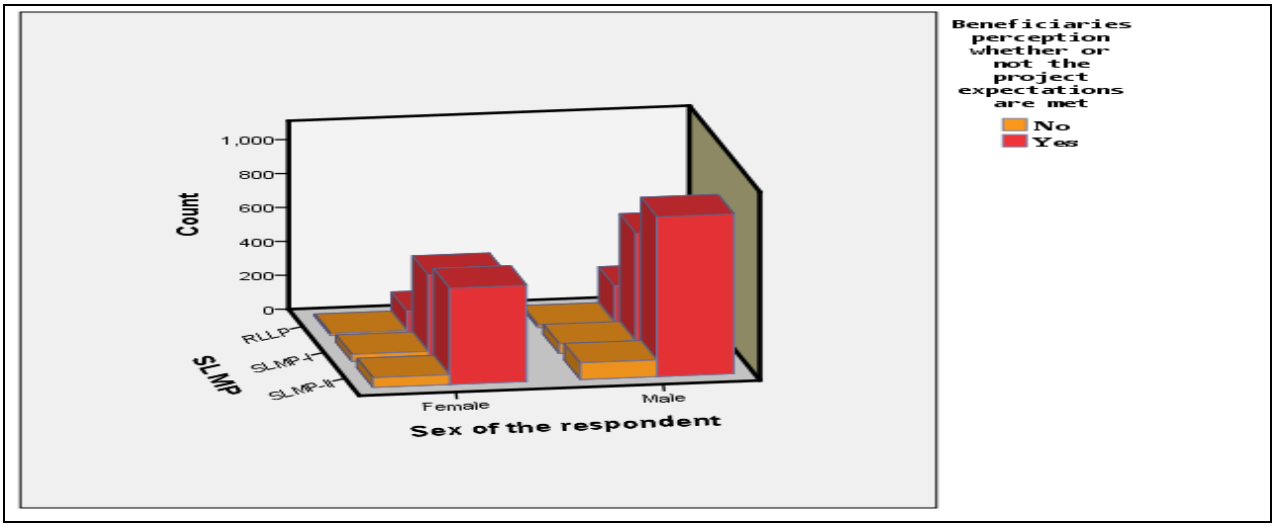


Source: 2021 RLLP beneficiary household questionnaire

3.2.5 Assessing whether expectations of beneficiary households are being met or otherwise;

The figure below demonstrates that respondents perceived the project has met their expectations in the latest phase of its implementation than its earlier version; manifesting the verity that the practitioners have took imperative lessons from the past to integrate into the later version of the program implementation. Both men and women beneficiary groups enjoyed the benefits of the third phase of the program implementation though its full implementation and benefit accrued are yet to be realized.

Figure 6: Respondent's response on the project meeting all the expectations



Source: 2021 RLLP beneficiary household questionnaire

3.2.6 Reasons for the high levels of satisfaction

The participation of women on project activities was understood to be immense; wherein the benefits are accrued through poultry farm business, revenue from sheep fattening and access to improved seed. In addition, improved farm equipment is gained as a reward for participation in SWC practices. Moreover, the participation of women ranges from involvement in SWC practices

to compost preparation. A typical example for productivity improvement due to the project is a 50 per cent increment in haricot bean productivity in Oromia region.

The youth on the other hand have made direct labor contribution on the project activities; especially in SWC practices and rehabilitation programs for highly degraded communal and non-communal lands. In the process, the youth are benefited from the wage received for labor contribution as well as from restored ecosystem services. The income received was also invested for consumption expenditure, covering tuition fees and household assets for future consumption or investment. Some of the youth are as successful as being dairy cow owners from their income generated through poultry sales.

In addition, we tried to explore if the project has brought new landscape in the community and whether or not land rehabilitation and ecosystem restoration activities of the project was successful. The elders have confirmed that the project component of sustainable land management was effective and the ecosystem is effectively restored as they knew how it had been in the distant past. Moreover, through the project, welfare gains were possible, farming efficiency was realized and household livelihood was diversified.

In spite of all the benefits that the project has brought to both direct and indirect beneficiaries, we found that the transparency through which the CIG members were recruited, the type and quantity of livelihood diversification activities and most importantly the land use rights for communal lands in some regions where the program was implemented are amongst the salient reasons where dissatisfaction arises. Moreover, because some of the diversification activities are not introduced in full packages i.e. a poultry without the feed, beekeeping without the equipment needed for honey production, a mango tree without a pesticide and conservation agriculture practices without mulching alternatives and the trade-offs with pest and disease prevalence for those crops produced through mulching.

3.2.7 Sources of beneficiary household's complaints/dissatisfaction in regard to project intervention;

The major challenge and source of dissatisfaction was to mobilize people in SWC practices as the numbers of households residing in some of the watershed are too few to address all farm and communal lands. Equally important source of dissatisfaction was the budget scarcity which forced to carry out the physical SWC activities for free in some watersheds and it was also a source of complain and grievances and forced some of the micro watersheds to be graduated earlier than they should be. The number of nursery sites was also not adequate to exercise agroforestry in farmlands and was mentioned as a challenge during the implementation. More importantly, mulching material was also a challenge to fully practice conservation agriculture.

3.2.8 Improvement measures to satisfy the beneficiary households;

Women and youth need for those livelihood activities that require less if not no land should be introduced. Moreover, this target groups need to be organized in groups to pool the resources for higher return and managing cost of production. In addition, as livestock feed sources are promoted in the project, sheep and goats, dairy cows or bulls for fattening would made them successful. Poultry is highly recommended in the area for women which requires less time for management and make profits.

Women need water pumps for their irrigable lands so that they can improve household income by growing crops in the commonly called lean time. In this regard, other agricultural inputs should also be delivered on time and credit arrangements should be made for accessing them. Other complementary technologies should be provided for women. They strongly adhered that they don't need land but, technologies. The youth in the same token need water pumps, accessing and controlling communal lands in each kebele and most importantly wage levels for SWC get improved and payments would be better if made through youth associations.

Women are eager if the program will scale up and widened in activities and budget. They want to engage in fattening as animal feed resources are abundant and they have widened their demand to tractor for mechanization. As springs and river charges are maximized, a water pumpers support could also reward women better. Moreover, value chain development should be given due consideration as cash crops produced has to sold when required. Especially the youth should engage in value addition activities. But, they do equally require training and technical support. In the same token, fruits and vegetables are the most preferred commodities they want to engage largely on.

3.3 Land users adopting sustainable land management practices.

It is important to note that Land is the terrestrial biologically productive system comprising soil, vegetation, and the associated ecological and hydrological processes; Adoption refers to change of practice or change in the use of a technology promoted or introduced by the project; Sustainable landscape management (SLM) practices therefore refers to a combination of at least two technologies and approaches to increase land quality and restore degraded lands for example, agronomic, vegetative, structural, and management measures that, applied as a combination, increase the connectivity between protected areas, forest land, rangeland, and agriculture land. The section below describes the findings of the study about the land users adopting sustainable land management practices supported by the project

3.3.1 Land users adopting sustainable land management practices in their farmland and communal land.

Out of the 3794 survey respondents, it was discovered that 3555 had adopted sustainable land management practices. The total number of land users adopting SLM practice was determined using the formula below that was derived from the general proportional formula in equation (2) in section 3.2 above.

$$\text{Land users adopting SLM practices } \frac{\text{Findings of the study}}{\text{Total sample size}} \times \text{July 2021 cumulative target}$$

$$\text{Land users adopting SLM practices } \frac{3555}{3794} \times 431{,}023$$

The total number of land users adopting sustainable land management practices is **403,871.** This represents 97.3% achievement of the targeted beneficiaries and confidently confirm that at the end of the project, the indicator achievement will be over 100%.

3.3.1.1 Adoption of sustainable land management practices regional analysis

The findings of the study indicate that across the regions, Amhara and SNNPR take lead in adopting the sustainable land management practices. These are followed by Oromia, Sidama, Gambela and then Benshangul Gumuz. In Amhara, Agronomic practices (mulching, crop rotation, intercropping etc.) and Land structural measures (Physical construction, Terraces) are the most commonly adopted sustainable land management practices; in Benshangul Vegetative practice (planting of perennial trees, shrubs, grasses) and Land structural measures (Physical construction, Terraces) are the most commonly adopted sustainable kland management practices, In Gambela, Agronomic practices (mulching, crop rotation, intercropping etc.) and Vegetative practice (planting of perennial trees, shrubs, grasses) are the most commonly adopted land management practices; just like it is in Oromia. Sidama and SNNPR are the only two regions where all the four sustainable land management practices of Agronomic practices (mulching, crop rotation, intercropping etc.), Vegetative practice (planting of perennial trees, shrubs, grasses), Land structural measures (Physical construction, Terraces), Land management measures (Agroforestry) are highly adopted. The table below describes the rate of adoption of sustainable land management practices within and across the regions

Table 84: Regional analysis of the adoption of sustainable land management practices

		Region of the respondent																	
		Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR		
Sustainable land management practices		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Agronomic practices	No	85	23.0	8.2	29	7.8	14.2	23	6.2	28.7	170	45.9	18.8	23	6.2	9.0	40	10.8	4.1
	Yes	950	30.7	91.8	175	5.7	85.8	57	1.8	71.3	735	23.8	81.2	232	7.5	91.0	941	30.5	95.9
Vegetative practice	No	394	43.4	38.1	45	5.0	22.1	24	2.6	30.0	203	22.4	22.4	52	5.7	20.4	190	20.9	19.4
	Yes	641	25.1	61.9	159	6.2	77.9	56	2.2	70.0	702	27.5	77.6	203	8.0	79.6	791	31.0	80.6
Land structural measures	No	191	22.2	18.5	69	8.0	33.8	38	4.4	47.5	277	32.2	30.6	65	7.6	25.5	220	25.6	22.4
	Yes	844	32.5	81.5	135	5.2	66.2	42	1.6	52.5	628	24.2	69.4	190	7.3	74.5	761	29.3	77.6
Land management measures	No	578	31.5	55.8	141	7.7	69.1	38	2.1	47.5	368	20.1	40.7	156	8.5	61.2	553	30.2	56.4
	Yes	457	28.1	44.2	63	3.9	30.9	42	2.6	52.5	537	33.0	59.3	99	6.1	38.8	428	26.3	43.6

Source: 2021 RLLP beneficiary household questionnaire

3.3.1.2 Adoption of sustainable land management practices by program phase.

The study discovered that watersheds in SLMP-II have highly adopted sustainable land management practices compared to the ones in SLMP-I and RLLP; and within the specific phases, the adoption of Agronomic practices (mulching, crop rotation, intercropping etc.) and Land structural measures (Physical construction, Terraces) are highly adopted compared to the Vegetative practice (planting of perennial trees, shrubs, grasses) and Land management measures (Agroforestry) as shown in the table below.

Table 85: Adoption of sustainable land management practices by program phases

		Project phases								
		SLMP-I			SLMP-II			SLMP-III		
		Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %
Agronomic practices	No	261	50.3	17.9	225	43.4	13.1	33	6.4	8.8
	Yes	1197	39.4	82.1	1499	49.4	86.9	340	11.2	91.2
Vegetative practice	No	514	47.9	35.3	475	44.3	27.6	83	7.7	22.3
	Yes	944	38.0	64.7	1249	50.3	72.4	290	11.7	77.7
Land structural	No	331	36.1	22.7	447	48.7	25.9	140	15.3	37.5
measures	Yes	1127	42.7	77.3	1277	48.4	74.1	233	8.8	62.5
Land management	No	810	40.2	55.6	959	47.6	55.6	244	12.1	65.4
measures	Yes	648	42.0	44.4	765	49.6	44.4	129	8.4	34.6

Source: 2021 RLLP beneficiary household questionnaire

3.3.1.3 Adoption of sustainable land management practices by AEZs

By comparing the different agroecological zones, Sustainable land management practices are highly adopted in Dega and Weyena Dega compared to Upper Kolla. Within the phases however, Land structural measures (Physical construction, Terraces) and Land management measures (Agroforestry) are highly adopted in Deaga, while Agronomic practices (mulching, crop rotation, intercropping etc.) and Vegetative practice (planting of perennial trees, shrubs, grasses) are commonly adopted in Weyena and upper kollla. The table below describes the adoption of sustainable land management practices within and across the different agroecological zones.

Table 86: Adoption of sustainable land management practices within and across the AEZs

Sustainable land management practices		Category of household					
		Female headed household			Male headed household		
		Count	Row %	Col %	Count	Row %	Col %
Agronomic practices	No	130	35.1	12.8	240	64.9	9.8
	Yes	885	28.6	87.2	2205	71.4	90.2
Vegetative practice	No	268	29.5	26.4	640	70.5	26.2
	Yes	747	29.3	73.6	1805	70.7	73.8
	No	253	29.4	24.9	607	70.6	24.8

Land structural measures	Yes	762	29.3	75.1	1838	70.7	75.2
Land management measures	No	514	28.0	50.6	1320	72.0	54.0
	Yes	501	30.8	49.4	1125	69.2	46.0

Source: 2021 RLLP beneficiary household questionnaire

3.3.2 Female headed households adopting sustainable land management practices.

$$\text{Female l headed HH adopting SLM practices } \frac{\text{Findings of the study}}{\text{Total sample size}} \times \text{Target female HH}$$

$$\text{Female land users adopting SLM practices } \frac{885}{1015} \times 37{,}493$$

The findings of the study indicate that a total of 32690 female headed households are currently adopting sustainable land management practices supported the RLLP project. This represents over 87% achievement of the project targeted female headed to be reached at the end of the project.

The study further discovered that Agronomic practices (mulching, crop rotation, intercropping etc.) are the most commonly sustainable land management practices adopted in female headed households, followed by Vegetative practice (planting of perennial trees, shrubs, grasses), Land structural measures (Physical construction, Terraces), Land management measures (Agroforestry) as described by the statistics in the table below.

Table 87: Adoption of sustainable land management practices with female headed households

Sustainable land management practices		Category of household					
		Female headed household			Male headed household		
		Count	Row %	Col %	Count	Row %	Col %
Agronomic practices	No	130	35.1	12.8	240	64.9	9.8
	Yes	885	28.6	87.2	2205	71.4	90.2
	Yes	762	29.3	75.1	1838	70.7	75.2
Land management measures	No	514	28.0	50.6	1320	72.0	54.0
	Yes	501	30.8	49.4	1125	69.2	46.0

Source: 2021 RLLP beneficiary household questionnaire

3.3.3 Women land users adopting sustainable land management practices.

The number of Female (Women) land users adopting SLM practices was determined by combining the number of females (Women) in both the male and female headed households and expressed as a proportion of the targeted project female beneficiaries. Out of the 1324 Women

respondents, it was discovered that 1126 had adopted sustainable land management practices. The total number of female land users adopting SLM practice was determined using the formula below that was derived from the general proportional formula in equation (2) in section 3.2 above.

$$\text{Female land users adopting SLM practices } \frac{\text{Findings of the study}}{\text{Total sample size}} \times \text{Target female land users}$$

$$\text{Female land users adopting SLM practices } \frac{1126}{1324} \times 212613$$

The findings of the study indicate that a total of 180,817 females (Women) are currently adopting sustainable land management practices supported the RLLP project. This represents over 87% achievement of the project targeted female land users to be reached at the end of the project.

3.3.4 Evidence of transformative capacity among households

The following table provides evidence of transformative capacity among both Male headed and female headed households. The most commonly adopted indicators of transformative capacity are SWC technologies (Terraces & moisture harvesting structures) is followed by farm water &; soil management practices (Terraces, soil cover, road water harvesting, hand dug wells, digging of ponds and then followed by integrated soil fertility management technologies.

Table 88: Evidence of transformative capacity

		Category of household					
		Female headed household			Male headed household		
		Count	Row %	Col %	Count	Row %	Col %
Adopted SWC technologies	No	72	34.1	11.5	139	65.9	10.5
	Yes	554	31.9	88.5	1180	68.1	89.5
Adopted farm water &; soil management practices	No	87	37.0	13.9	148	63.0	11.2
	Yes	539	31.5	86.1	1171	68.5	88.8
Adopted ISFM technologies	No	286	32.8	45.7	587	67.2	44.5
	Yes	340	31.7	54.3	732	68.3	55.5

Source: 2021 RLLP beneficiary household questionnaire.

3.3.5 Participation in change of the use of a technology promoted by RLLP

3.3.5.1 Total number of land users who participated in the change of the technology

$$\text{Land users that participated in the change of technology } \frac{\text{Findings of the study}}{\text{Total sample size}} \times \text{Target land users}$$

$$\text{Land users awho participated in the change of technology} = \frac{1967}{3794} \times 431{,}023$$

The study discovered that a total of 223464 land users participated in the change of the use of technology introduced and promoted by RLLP. This represents 51.8% achievement of the indicator. This implies that the project has higher chances of attaining 100% of the targeted land users to participate in the change of the technology.

3.3.5.2 Participation in the change of the use of technology

The rate of participation in the change of the technologies is highest in Amhara, followed by Benshangul Gumuz, followed by Gambela, Oromia, SNNPR and Sidama. Table below describes the rate of participation in the change of the technology across and within the regions

Table 89: Participation in the change of the technology within and across the regions

Participation in the change of technologies		Region of the respondent																	
		Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Q514	No	76	22.0	7.1	76	22.0	27	38	3.8	37.6	49	14.2	9.5	25	7.2	9.2	81	23.5	25.3
	Yes	991	44.8	92.9	206	9.3	73	63	0.6	62.4	468	21.1	90.5	247	11.2	90.8	239	10.8	74.7

Source: 2021 RLLP beneficiary household questionnaire.

3.3.5.3 Participation in the change of technology disaggregated by phases of the program.

The findings of the study indicated that the participation in the change of the technology is higher in among watersheds in SLMP-II, followed by watersheds in SLMP-I and then followed by watersheds in RLLP. The table below describes the findings of the study about the participation in the change of technologies in the different phases of the assignment.

Table 90: Participation in the change of the technology across the phases of the program

Participation in the change of the technology	Project phases								
	SLMP-I			SLMP-II			SLMP-III		
	Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %
No	137	42.8	13.1	171	53.4	15.1	12	3.8	10.5
Yes	906	46.1	86.9	959	48.8	84.9	102	5.2	89.5

Source: 2021 RLLP beneficiary household questionnaire.

3.3.5.4 Participation in the change of the technology across the AEZs

The participation in the change of the technology was found to be highest among watersheds found in Dega, followed by the ones in Weyena and later followed by Upper Kolla as described in the table below.

Table 91: Participation in the change of technology across the agroecological zones

Participation in the change of technologies		Agro-ecological zone of the watershed								
		Dega			Upper Kolla,			Weyena Dega		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Q514	No	71	22.2	7.9	80	25.0	27.2	169	52.8	15.5
	Yes	829	42.1	92.1	214	10.9	72.8	924	47.0	84.5

Source: 2021 RLLP beneficiary household questionnaire.

3.3.5.5 Participation of households in the change of the technology.

The rate of participation in the change of the technology is higher in Male headed households compared to female headed households.

Table 92: participation in the change of the technology by both Male and female headed households

Participation in the change of technologies		Category of household					
		Female headed household			Male headed household		
		Count	Row %	Col %	Count	Row %	Col %
Q514	No	117	36.6	15.3	203	63.4	13.3
	Yes	646	32.8	84.7	1321	67.2	86.7

Source: 2021 RLLP beneficiary household questionnaire.

3.3.6 The extent to which the project beneficiaries are involved in the adoption and integration of the project approved technologies into their regular livelihoods;

This was determined by calculating the average rate of adoption of the different kinds of technologies such as SWC technologies, Farm water & soil moisture management technologies, climate smart agriculture, integrated soil fertility management technologies and environmentally friendly forage development practices.

Table 93: the extent to which beneficiaries are involved in the approved technologies

Type of technology	Adoption rate (%)
SWC	90
Farm water & moisture management	53
Integrated soil fertility management	46
Environmentally friendly forage development	90.1
Climate smart agriculture	23
Average adoption rate	**60.22**

Source: 2021 RLLP beneficiary household questionnaire.

From the average adoption rate of the approved technologies of 65.8%, it can confidently be confirmed that **to a greater extent**, the project beneficiaries are involved in the adoption and integration of the project approved technologies into their regular livelihoods

3.3.7 Determinants of adoption and integration of technologies in the context of Ethiopia.

The study examined factors influencing the adoption and integration of technologies in the Ethiopian context. The findings of the study indicate that a number of factors have hindered the adoption of land management, soil and water conservation technologies. These include but not limited to

The nature of land tenure system

Note that ***Rist*** *i*s the term given to the form of land tenure that developed in the highlands of northern Ethiopia. Rist is a group right, in which the land is owned by the group family. It is divided and re-divided among the descendants of the founder of the land through time, and inherited within the family for generations. The land tenure system in some regions of Ethiopia have discouraged the adoption the different kinds of technologies for sustainable land management. In Benishangul for example a section of people (migrants and settlers) are not allowed to own more than 0.8 hectares of land as opposed to the indigenous people who are allowed to own any size of land. This has greatly affected the adoption of land management technologies by beneficiaries who are not indigenous in the region, thereby impacting the entire process of adopting sustainable land management practices.

Unwillingness of the youths to engage in Agriculture

The study further discovered that majority of the youth are not interested engaging in agriculture as a source of livelihood; they are interested in non-farm activities such as petty trade, bajaji driving, Buna selling along the roads, bakery among others. This therefore leaves the crop and

livestock production activities in the hands of the elderly whose energy levels are not high enough to adopt the sustainable land management technologies, some of which are labor intensive.

Rural urban migration

The findings of the KIIs and FGDs showed a very high rate of rural urban migration in all the six regions that were visited during the assignment execution. This information is in line with the findings of the study about Rural youth migration and informal self-employment in Ethiopia by Sosina Bezu and Stein T Holden 2013. The report found significant rural-urban migration in Ethiopia. One-third of the households in the village experienced rural-urban migration in the period 2007-2013; and 21% have at least one youth migrant. This has also negatively affected the rate of adopting soil and water conservation technologies because land management is left to the elderly whose adoption rate tend to be low.

Limited skills to undertake to adopt the new technologies.

Despite that fact that the percentage of the targeted participants who are literate is slightly higher than the ones who are illiterate, (50.7% :49.3%), the difference is not so significant. It is important to note that sustainable land management practices, soil and water conservation technologies are technical aspects and require a certain level of literacy for easy adoption. The relatively high level of illiteracy (49.3%) among the targeted beneficiaries has negatively affected the rate of adoption of the different kinds of technologies. Other factors that hindered the adoption the different kinds of technologies include but not limited to limited capital to adopt and implement the different kinds of terraces among others.

3.3.7.1 How beneficiaries reported about the factors limiting the adoption of the different kinds of technologies

The table below describes how different participants reported about the factors hindering the adoption of the different kinds of technologies in the different regions

Table 94: report on factors hindering the adoption of the different kinds of technologies

		Region of the respondent																
		Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR		
		Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
Cultural setup	No	227	30.4	35.8	45	6.0	21.7	33	4.4	64.7	329	44.0	42.9	48	6.4	32.4	65	8.7	16.4
	Yes	407	27.9	64.2	162	11.1	78.3	18	1.2	35.3	438	30.1	57.1	100	6.9	67.6	332	22.8	83.6
Limited skills	No	119	22.3	18.8	58	10.9	28.0	17	3.2	33.3	267	50.0	34.8	30	5.6	20.3	43	8.1	10.8
	Yes	515	30.8	81.2	149	8.9	72.0	34	2.0	66.7	500	29.9	65.2	118	7.1	79.7	354	21.2	89.2
Technology costly	No	260	25.0	41.0	105	10.1	50.7	24	2.3	47.1	328	31.6	42.8	97	9.3	65.5	224	21.6	56.4
	Yes	374	32.1	59.0	102	8.7	49.3	27	2.3	52.9	439	37.7	57.2	51	4.4	34.5	173	14.8	43.6
Not interested	No	626	29.2	98.7	204	9.5	98.6	51	2.4	100.0	734	34.2	95.7	136	6.3	91.9	393	18.3	99.0
	Yes	8	13.3	1.3	3	5.0	1.4	0	.0	.0	33	55.0	4.3	12	20.0	8.1	4	6.7	1.0

Source: 2021 RLLP beneficiary household questionnaire.

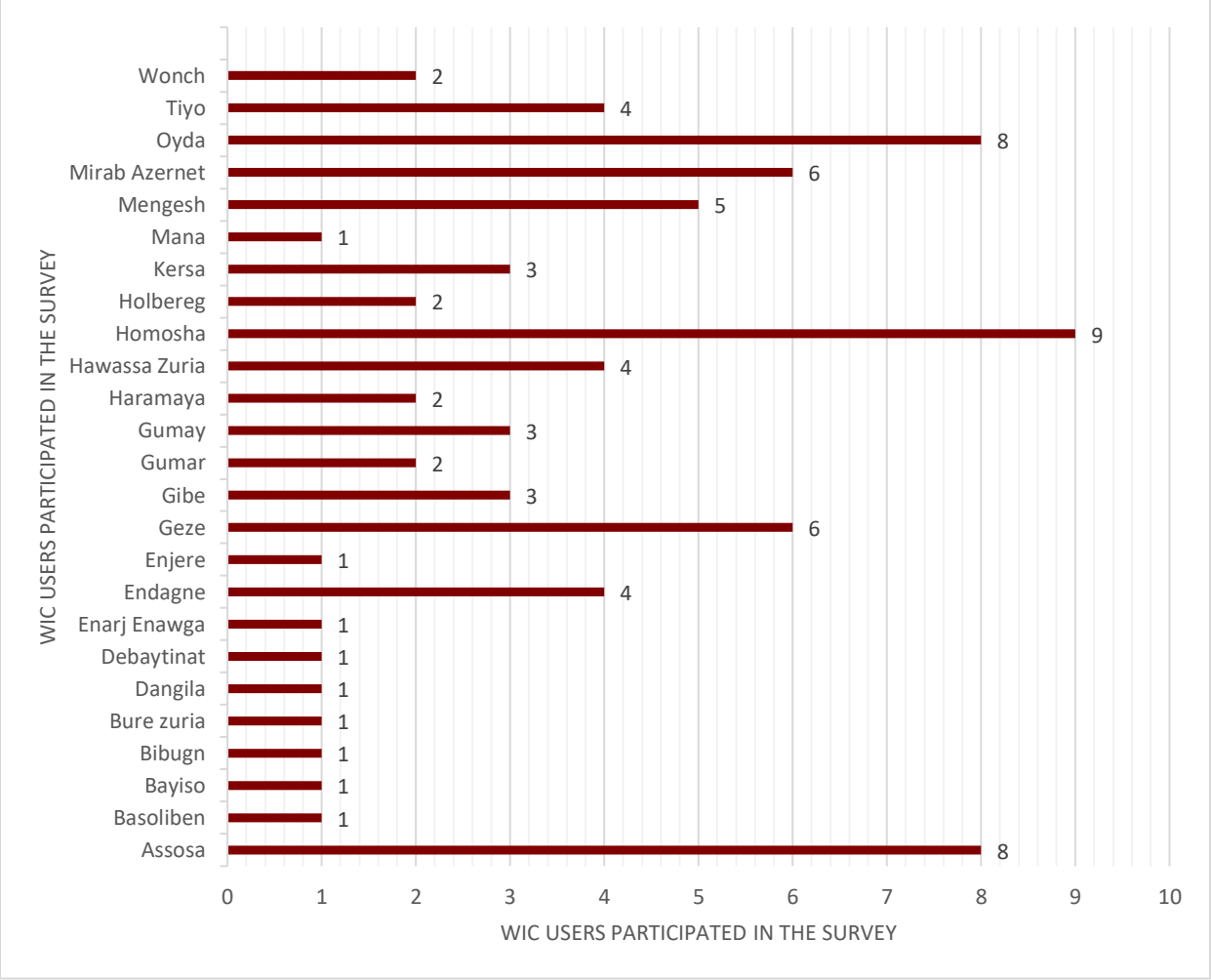
3.4 The effective utilization of Woredas information centers by project stakeholders.

Note that SLM Woreda information centers are information hubs located in woreda towns under the woreda agriculture and natural resources office to primarily serve the woreda and below woreda level SLMP experts and supporting staffs. The woreda SLM focal person are responsible to manage the overall activities of the center. The centers help them acquire information and technical assistance that enhance their skill and knowledge thereby raising awareness on new SLM practices. The centers are also expected to serve as repositories for data, information, communication and knowledge products related to SLM/NRM and agricultural development. The section below presents the findings of the assessment that was conducted on the effective utilization of the WICs

3.4.1 Number of WIC users and Names of WICs that were assessed.

The assessment on the effectiveness of was conducted on 26 WIC and captured information from 85 targeted users. The figure beneficiaries the number and name of the Woreda information centers together with the total number of WIC user's that participated in the assessment of the effective utilization of the WIC.

Figure 7: Number of WIC that were assessed



Source: 2021 RLLP beneficiary household questionnaire.

3.4.2 WIC information centers and their respective regions

The table below describes the number and name of WIC that were visited during the assessment. The table indicates that Oromia, SNNP and Amhara had more WIC visited compared to Gambela, Benshangul & Sidama.

Table 95: Woreda information centers that were assessed

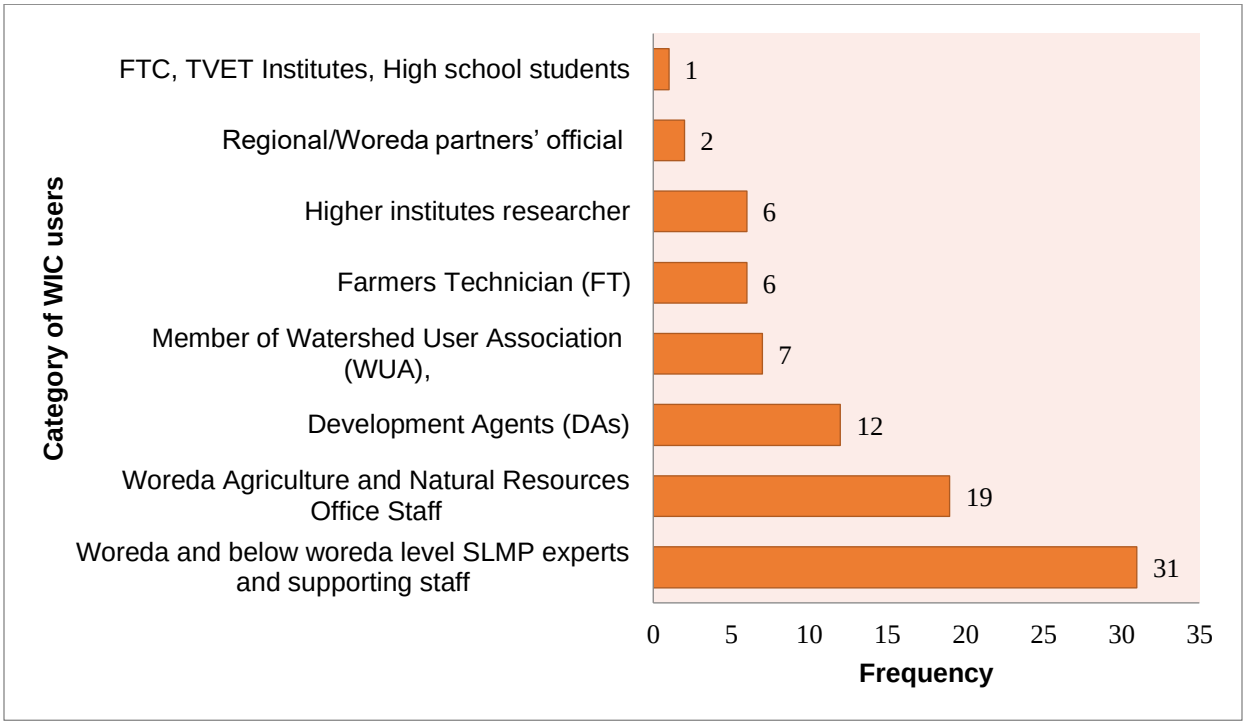
Region	Woreda Information Center (WIC)
Gambela	Mengeshi
Benishangul Gumuz	Assossa
	Homosha
Sidama	Hawassa Zuria
Amhara	Dangila
	Bure Zuria
	Bibugn
	Debay Tena
	Enarj Enawga
	Baso Liben
SNNP	Hulberag
	Gibe
	Mirab Azanech
	Endagne
	Gumer
	Oyda
	Geze Gofa
Oromia	Tiyo
	Haramaya
	Enjere
	Wanch
	Gumay
	Mana
	Kersa
	Bayisu

Source: 2021 RLLP WIC assessment tool.

3.4.3 Targeted users of the WICs

The assessment discovered that the WIC are mainly used by the Woreda and below Woreda level SLMP experts. This confirms the effective utilization of the WIC because this category is the primarily target of the Woreda information centers according to the guidelines governing the operation and functionality of the Woreda information centers. The figure below describes the findings of the assessment in line with the target users of the WICs.

Figure 8: Target users of the WICs

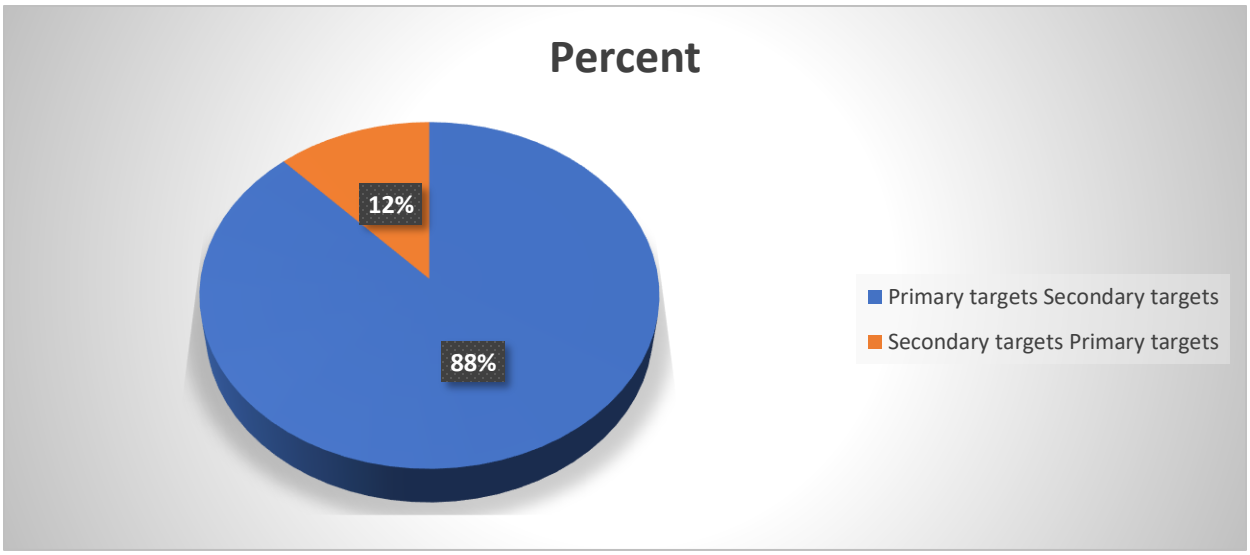


Source: 2021 RLLP WIC assessment tool.

3.4.3.1 Categories of WIC target users.

The assessment showed that both the primary and secondary target users have access to and effective utilization of the Woreda information centers. The findings of the assessment indicated that 88% of the WIC users are Woreda level NRM experts and staff working closely with the SLMP; while 12% were the secondary targeted users.

Figure 9: Categorization of the targeted users

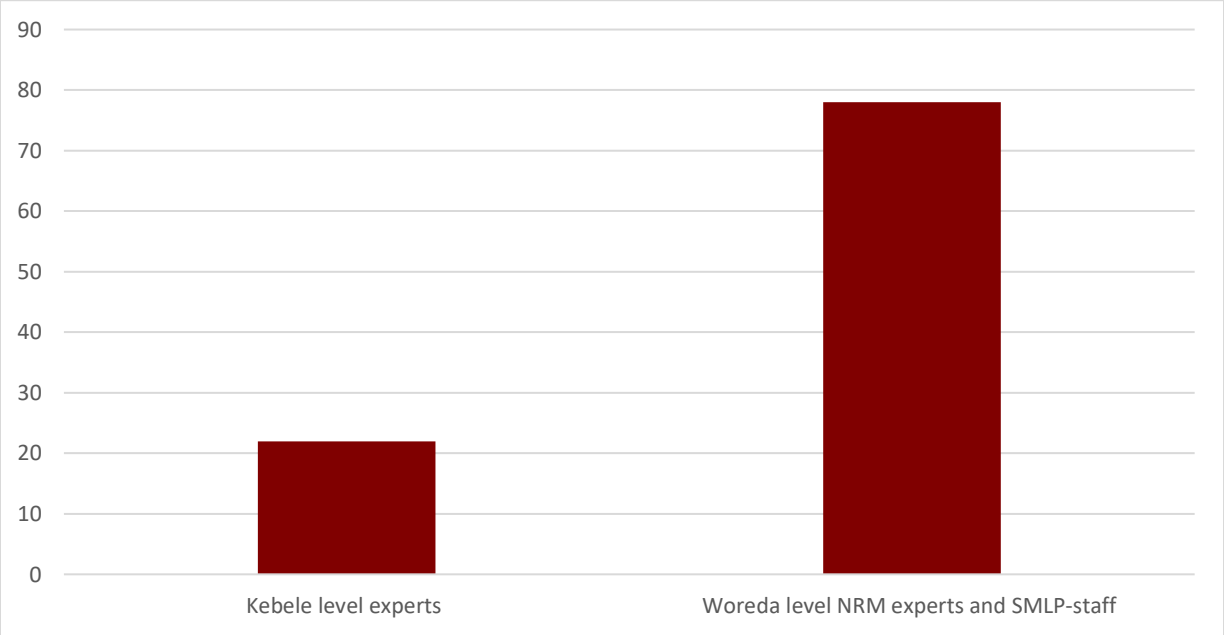


Source: 2021 RLLP WIC assessment tool.

3.4.3.2 Primary targets

Out of the primary target of the WICs, were found to be Woreda level Natural resource management experts and SLMP Staff; while 22% are kebele level experts. The figure below illustrates the primary targets of the Woreda information centers.

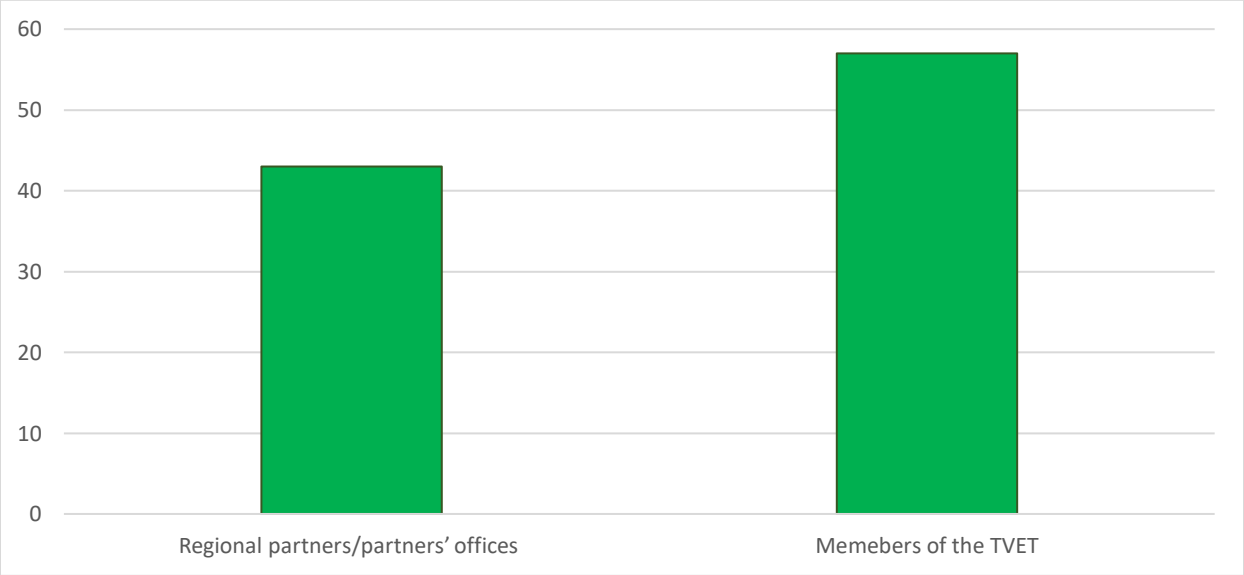
Figure 10: Primary targets of the WICs



Source: 2021 RLLP WIC assessment tool.

3.4.3.3 Secondary targeted users of WICs

The figure below shows that 57% of the secondary target users of WIC are members of the TVET institutions, while 47% of the secondary targets are regional partners and other partner offices.



Source: 2021 RLLP WIC assessment tool.

3.4.4 WICs user's opinion and satisfaction levels

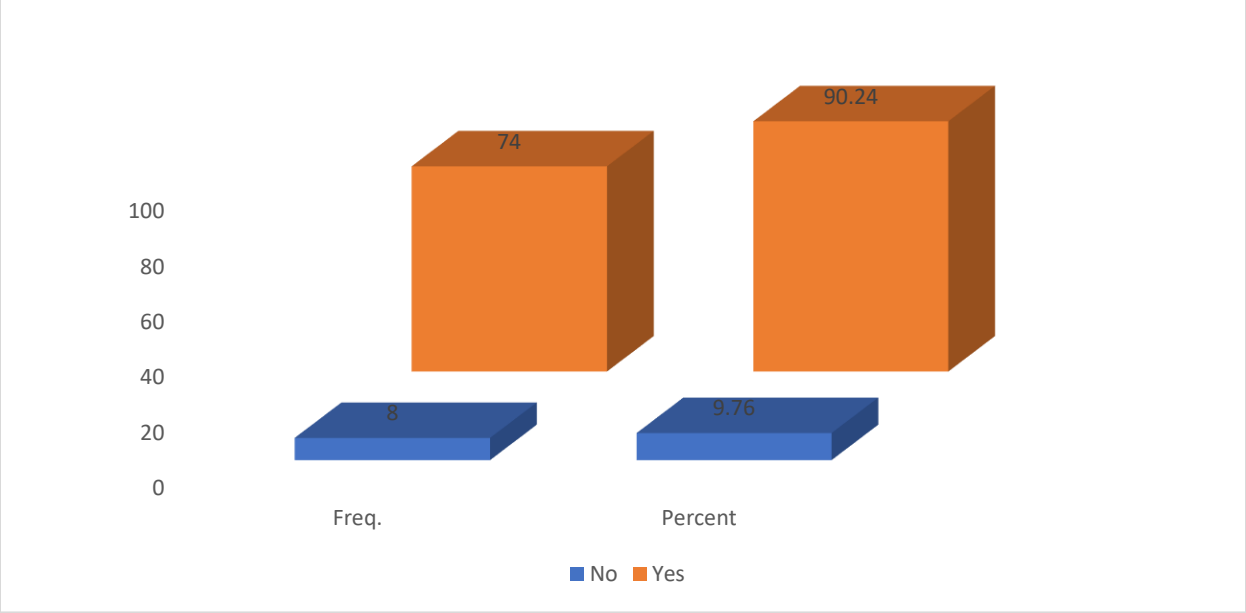
This section presents the opinions of the users of the WICs on a number of aspects, such as satisfaction levels, functionality, rate of visiting, challenges faced by the WICs among others.

3.4.4.1 Awareness of the existence of WICs.

3.4.4.2 Functionality of the WICs

Note that this question was asked to the users to establish their opinions on whether they are able to obtain all the services they look out for in the WICs. The findings of the study show that 90.24% of the target users reported that the WICs are fully functional. The figure below describes how users reported on the functionality of the WICs

Figure 11: Assessing the functionality of the WICs



Source: 2021 RLLP WIC assessment tool.

3.4.4.3 Users who visited the WIC

The assessment investigated the rate at which the targeted users visit the different WIC. The findings of the study show that the rate of visiting and accessing the required information is 100%. This implies that all the users who participated in the study had at some point visited and used WICs. This implies an effective utilization of the center.

Table 96: Rating of visiting and accessing information from the WICs

Rate of visiting WIC	Freq.	Percent	Cum.
No			
Yes	85	100	100
Total	85	100	

Source: 2021 RLLP WIC assessment tool.

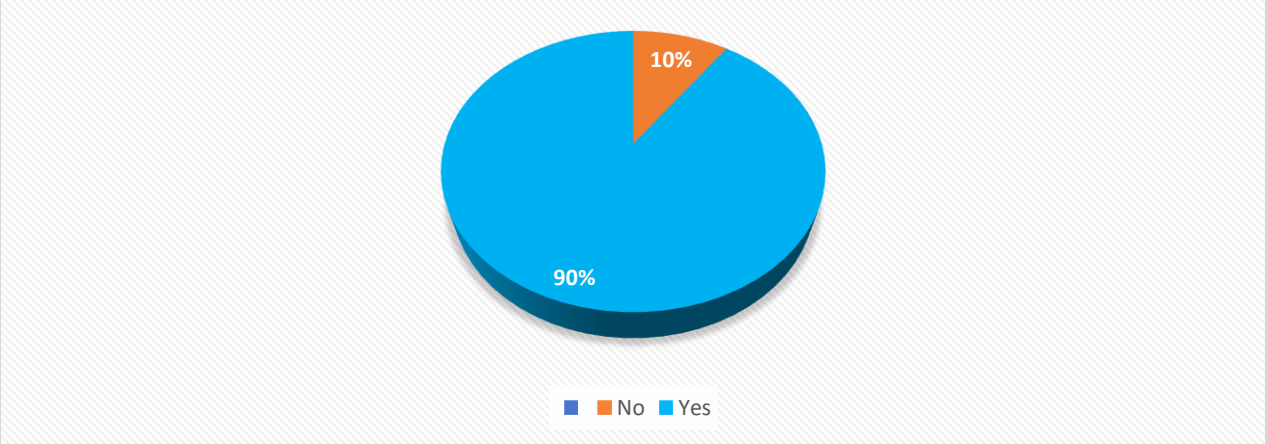
3.4.4.4 Services offered at WICs

A number of services are offered at the Woreda information centers. These services are in line with the different types of targeted users (beneficiaries of the WICs). To the **Regions, Woreda and Kebele SLMP/RLLP experts**. The centers act as reference points with all the resources (guidelines, documents and other equipment) that are needed in the implementation of the SLMP/RLLP project related activities, **To the Academia and other researchers**, the centers offer a platform to conduct research by offering reading materials (Video, audio, documents and other resources; the centers also are fully equipped with computers and internet services which allows university students, tertiary institutions and other researchers to fully explore information on a number of topics and studies related to agriculture, land and natural resource management..

3.4.4.5 Satisfaction levels of WIC users on WICs

The findings of the assessment shows that 90% of the users are satisfied with the services offered by the Woreda information centers

Figure 12: Percentage of WIC users who are satisfied with the services offered by the WICs

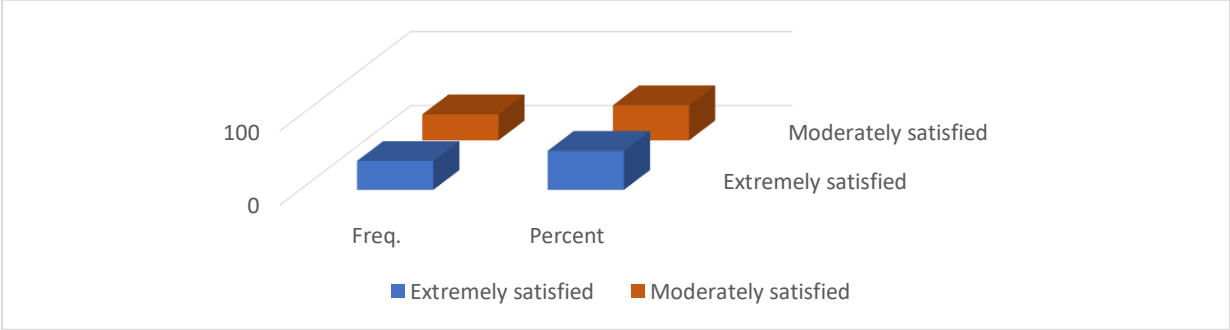


Source: 2021 RLLP WIC assessment tool.

3.4.4.6 Rating of the satisfaction levels

The assessment revealed that the rating of satisfaction is evenly distributed. The figure below shows that 52% of the users were found to be extremely satisfied; while the 48% of the target users are moderately satisfied.

Figure 13: Satisfaction levels for WICs



Source: 2021 RLLP WIC assessment tool.

3.4.4.7 Assessing for the difference in satisfaction levels among WIC users

Statistical tests were carried out to establish whether there is a significant difference among the users of the WICs in terms of their satisfaction levels about the services offered by the WICs. The findings of the survey show that there is no significant difference in the satisfaction levels among the users of the WICs whether primary or secondary target users. (Chi-square value = 3.716, df = 1, p-value = 0.054).

Table 97: Tests for the difference in satisfaction levels among WIC users

Test Statistics	
	Are you satisfied with services offered by the WIC
Chi-Square	3.716
df	1
Asymp. Sig.	.054
a. Kruskal Wallis Test	
b. Grouping Variable: Who are target users of WIC?	

Source: 2021 RLLP WIC assessment tool.

Tests were further performed to establish whether there is a difference in the level of satisfaction between Kebele and Woreda level NRM experts/officers. The findings of the survey indicate that there is no significant satisfaction difference between Kebele and Woreda level NRM experts/offices who received different services from the WICs (Chi-square value = 0.922, df = 1, p-value = 0.337).

Table 98: Testing for the difference in satisfaction levels Kebele and Woreda level NRM experts/officers

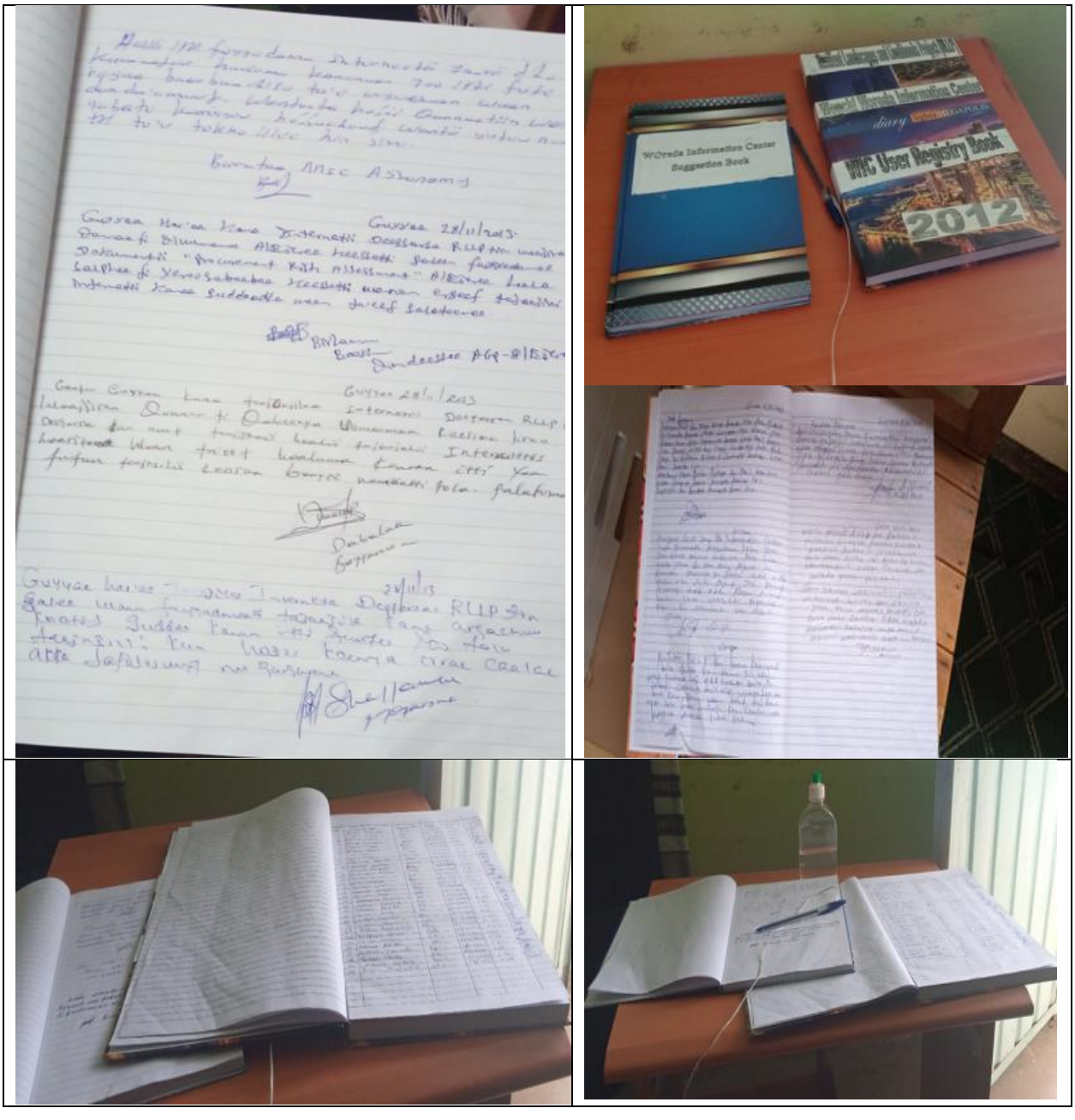
Test Statistics	
	Are you satisfied with services offered by the WIC?
Chi-Square	.922
df	1
Asymp. Sig.	.337
a. Kruskal Wallis Test	
b. Grouping Variable: Who are primary target users of WIC?	

Source: 2021 RLLP WIC assessment tool.

All the above tests were conducted to erase the doubts of whether the sampled number numbers of the WICs were good enough to generate a credible opinion in terms of satisfaction levels about the services offered by WICs. Since there is no significant difference in the levels of satisfaction among the users of the WICs, the survey can confidently affirm that the sample size was good enough to generate the credible user's opinion about the services offered by the WICs.

3.4.4.8 Mechanisms of tracking satisfaction feedback from the WIC users.

The findings of the study indicate that all WIC information centers have two big black books (Log books). One is used as a registry for the access and utilization of the Woreda information centers and the other is used capture feedback on the quality of services offered at the WIC. The survey team crosschecked all the books and can confidently confirm that the users are always writing feedback on the quality of services offered as well as making suggestions on what should be improved. This is a clear indication of the effective utilization of the Woreda information center.



3.4.4.9 Challenges facing the functionality & service delivery of the WIC.

The four major challenges affecting the effective utilization of the WIC are inadequate human resources, limited band width of the internet, electricity instability and limited spaces for some of the Woreda information centers.

a) Inadequate human resources/personnel

It is important to note that the woreda SLM focal persons are responsible to manage the overall activities of the center; The focal persons re however always engaged in supporting the activities of the project in the watersheds and micro watersheds in the different Woredas. In times when the focal persons are required to be in the field. The access and utilization of the WICs is always difficult, because it's always difficult to trust any other person to run the operation of the WICs incases when the focal persons are in the field.

b) limited band width of the internet

Whereas the WICs are intended to serve few users at a time; the internal facilities, chairs, computers, copies of documents, the size of the room, limits the number of users accessing the WICs at a time, sometimes during the week especially when students of higher institutions of learning are doing coursework and research, the internet speed tend to reduce and this affects the rate at which academic researchers access information.

c) Electricity shortage and limited funds to buy fuel to operate a generator.

Some of the watersheds/Woredas where the WICs are situated do not have electricity, for instance in Menegshi-Gambela region, they only rely on a generator and it is not guaranteed that there will be fuel to run the generator on a daily basis. This in one way or another affects the effective utilization of the Woreda information centers

3.4.4.10 Possible recommendations to improve service delivery for the WICs

a) The assessment recommends **hiring an extra person to support** the operation of the WICs especially in times when the focal person is required in the field to support the implementation of the field SLMP/RLLP field work activities
b) The assessment recommends **to supply additional Wi-Fi routers** to increase the speed of the internet and also be able to accommodate the so many users who tend to seek for the services of the Woreda information centers.
c) In the next phase of the RLLP project execution, **the funders and the coordination unit should think about establishing WIC buildings that are beyond just a minimum of 4 by 5 meters** to be able to accommodate the ever-increasing users of the Woreda information centers.
d) There is need to support the regular use of generators especially in woredas which do not have electricity. This will help to ensure that the users of the centers can access services without regularly without any hindrance.

3.4.5 Meeting of the building standards as per the Woredas information center guideline.

The assessment administered a verification checklist to assess whether the WICs meet building standards as per the Woredas information center guideline. The findings of the study show that,

with the exception of the few WICs found in SLMP-I and the ones that have just been constructed in RLLP, all the watersheds that were assessed and belong in SLMP-II meet the building standards as per the Woredas information center guideline. The table below summarizes the findings of the study as far as this thematic area is concerned.

Table 99: verification for WIC meeting the building standard

Region	Woreda Information Center (WIC)	Functionality Standard	Building Status	
			Yes	No
Gambela	Mengeshi	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
Benishangul Gumuz	Assossa	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Homosha	Use of electronic based system implementation data management	√	

		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
Sidama	Hawassa Zuria	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
Amhara	Dangila	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors		

		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Bure Zuria	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number & frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Bibugn	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Debay Tena	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	

		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Enarj Enawga	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Baso Liben	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers		√
SNNP	Hulberag	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through	√	

		computers connected to the national database		
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Gibe	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Mirab Azanech	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Endagne	Use of electronic based system implementation data management	√	

		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Gumer	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Oyda	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	

		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Geze Gofa	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
Oromia	Tiyo	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Haramaya	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	

		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Enjere	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Wanch	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Gumay	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through	√	

		computers connected to the national database		
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Mana	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Kersa	Use of electronic based system implementation data management	√	
		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	
	Bayisu	Use of electronic based system implementation data management	√	

		Practice of related documents, guidelines, knowledge products communication products	√	
		Easy access of resources in digital format or project database through computers connected to the national database	√	
		Clear communication of the existence of WIC through various media	√	
		Electricity connectivity/Standby generator	√	
		Documenting the number &; frequencies of visitors	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs Centers	√	

Source: 2021 RLLP WIC assessment tool.

3.4.6 Assessing whether the WICs are fully equipped with the necessary facilities.

The assessment examined whether the different WICs are fully equipped with the necessary facilities. The findings of the assessment showed that most of the WICs are fully equipped with necessary facilities; except some few that do not have a flat screen (which is not even compulsory). The table below describes how WICs are faring with the necessary facilities. It is important to note that uses of large screen TV can equally be taken up by the presence of an LCD projector. Therefore, WICs that did not have a large screen TV but had an LCD projector were regarded as meeting the requirement.

Table 100: WICs are fully equipped with the necessary facilities

Region	Woreda Information Center (WIC)	WICs are fully equipped with the necessary facilities	Facilities in the center	
			Yes	No
Gambela	Mengeshi	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
Benishangul Gumuz	Assossa	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	

	Homosha	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
Sidama	Hawassa Zuria	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		LCD projector	√	
Amhara	Dangila	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
	Bure Zuria	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
	Bibugn	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
	Debay Tena	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	

		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
	Enarj Enawga	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
	Baso Liben	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
SNNP	Hulberag	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV	√	
	Gibe	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV	√	
	Mirab Azanech	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	

		Large screen TV or LCD projector	√	
	Endagne	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
	Gumer	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV	√	
	Oyda	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
	Geze Gofa	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
Oromia	Tiyo	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
	Haramaya	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	

		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
	Enjere	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
	Wanch	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
	Gumay	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
	Mana	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	
	Kersa	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	

		Tablet Devices	√	
		Large screen TV or LCD projector	√	
	Bayisu	Office furniture	√	
		Shelf/cabinets	√	
		Desktop computers	√	
		Internet access	√	
		Backup Device - External hard drive and/or USB Flash Drive or CD, DVD	√	
		Tablet Devices	√	
		Large screen TV or LCD projector	√	

Source: 2021 RLLP WIC assessment tool.

3.4.7 Assessing the existence of variety of resources

The assessment further investigated the existence of a variety of resources in the woreda information centers. Note that the Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers are shared whenever farmers meet at WICs during experience sharing and photographs of the different farming techniques are taken and put on the walls of WICs to act as learning aid and demonstration materials for farmer technicians using the WICs. The findings of the study indicated that all the WIC that were assessed had a number of resources of resources. The table below illustrates the findings of the assessment as far as the existence of the resources.

Table 101: Existence of the resources

Region	Woreda Information Center (WIC)	The existence of variety of resources	Existence of resources	
			Yes	No
Gambela	Mengeshi	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
Benishangul Gumuz	Assossa	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
	Homosha	Data, information, audio-visuals, graphics, maps, educational	√	

		videos and other knowledge/communication products that showcase the SLM best practices		
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
Sidama	Hawassa Zuria	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
Amhara	Dangila	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
	Bure Zuria	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
	Bibugn	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	

	Debay Tena	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
	Enarj Enawga	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
	Baso Liben	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
SNNP	Hulberag	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
	Gibe	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	

	Mirab Azanech	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
	Endagne	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
	Gumer	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
	Oyda	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
	Geze Gofa	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	

Oromia	Tiyo	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
	Haramaya	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
	Enjere	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
	Wanch	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
	Gumay	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	

	Mana	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
	Kersa	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	
	Bayisu	Data, information, audio-visuals, graphics, maps, educational videos and other knowledge/communication products that showcase the SLM best practices	√	
		Indigenous knowledge and experience of farmers, scientific knowledge and practices should be made available in the centers	√	

Source: 2021 RLLP WIC assessment tool.

3.4.8 Assessing whether WICs meet the functionality Requirements

All the WICs that were visited were assessed on a number of functionality requirements which include: Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices; Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users; Access to publications/printed knowledge and communication products. Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services; Documenting the number and frequency of visitors & making the information available for internal use and Regular assessment of the level of satisfaction of users with the services offered by the WICs centers. The table below summarizes the performance of WICs on functionality requirements

Table 102: Existence of the resources

Region	Woreda Information Center (WIC)	Functionality requirement	Whether WIC meets the requirement or not	
			Yes	No

Gambela	Mengeshi	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers	√	
Benishangul Gumuz	Assossa	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the	√	

		information available for internal use		
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers	√	
	Homosha	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers	√	
Sidama	Hawassa Zuria	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be	√	

		advertised in public places to inform target audiences about WIC's working hours, available resources and services		
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers		√
Amhara	Dangila	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers		√
	Bure Zuria	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	

		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers		√
	Bibugn	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers	√	
	Debay Tena	Availability of SLM/NRM practice related documents, guidelines, knowledge products	√	

		communication products, best practices		
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers		√
	Enarj Enawga	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	

		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers		√
	Baso Liben	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers		√
SNNP	Hulberag	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about	√	

		WIC's working hours, available resources and services		
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers	√	
	Gibe	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers	√	
	Mirab Azanech	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	

		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers	√	
	Endagne	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers	√	
	Gumer	Availability of SLM/NRM practice related documents, guidelines, knowledge products	√	

		communication products, best practices		
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers	√	
	Oyda	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	

		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers		√
	Geze Gofa	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers	√	
Oromia	Tiyo	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about	√	

		WIC's working hours, available resources and services		
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers	√	
	Haramaya	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers		√
	Enjere	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	

		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers		√
	Wonchi	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers	√	
	Gumay	Availability of SLM/NRM practice related documents, guidelines, knowledge products	√	

		communication products, best practices		
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers		√
	Mana	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	

		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers		√
	Kersa	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about WIC's working hours, available resources and services	√	
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers	√	
	Bayisu	Availability of SLM/NRM practice related documents, guidelines, knowledge products communication products, best practices	√	
		Regularly update of the resources, access of resources in digital format or project database through computers connected to the national database by users	√	
		Access to publications/printed knowledge and communication products	√	
		Clear communication of the existence of the WIC through various media and should be advertised in public places to inform target audiences about	√	

		WIC's working hours, available resources and services		
		Documenting the number and frequency of visitors & making the information available for internal use	√	
		Regular assessment of the level of satisfaction of users with the services offered by the WICs centers	√	

Source: 2021 RLLP WIC assessment tool.

3.4.9 Assessing the level of satisfaction

The findings of the assessment showed that 57/6% of the WICs have undertaken assessments on the satisfaction levels of the WIC users. These include: Mengeshi, Assossa, Homosha, Hulberag, Gibe, Mirab Arzanet, Endagne, Gumer, Geze Gofa, Tiyo, Wonchi, Kersa and Bayisu. The table below illustrates the performance of WICs as far as the assessment of users' satisfaction is concerned.

Table 103: Regular assessment of the level of satisfaction of users with the services offered by the WICs centers

Region	Woreda Information Center (WIC)	Frequency of the assessment		
		It has never been done	Once a year	Twice a year
Gambela	Mengeshi		√	
Benishangul Gumuz	Assossa		√	
	Homosha		√	
Sidama	Hawassa Zuria	√		
Amhara	Dangila	√		
	Bure Zuria	√		
	Bibugn		√	
	Debay Tena	√		
	Enarj Enawga	√		
	Baso Liben	√		
SNNP	Hulberag		√	
	Gibe		√	
	Mirab Arzanet		√	
	Endagne		√	
	Gumer		√	
	Oyda	√		
	Geze Gofa		√	
Oromia	Tiyo		√	
	Haramaya	√		
	Enjere	√		
	Wonchi		√	
	Gumay	√		
	Mana	√		
	Kersa		√	
	Bayisu		√	

Source: 2021 RLLP WIC assessment tool.

3.4.10 Other requirements for the WICs to be considered as functional and effective.

The WICs are not only considered functional and effectively used by the project stakeholders. The centers are functional and effectively used by not only SLMP/RLLP project stakeholders. Section 3.5.4.4 comprehensively discuss the different users of the Woreda information centers and the different kinds of services that are offered by the woreda information centers.

3.4.11 Assessing whether woreda stakeholders access WICs as planned

All the woreda information centers that were visited have schedules on their respective notice board. They have time tables which clearly indicate the time at which the Woreda information centers are opened and the time of closure. This confirms that the woreda stakeholders access the woreda information center in a planned and an orderly manner.

3.4.12 Existence of recording mechanism to capture visitors name and their interest.

All the Woreda information centers that we visited have two books; one is used to capture the attendance of the users (visitors name and their interest) and other is used to capture feedback on the quality of the services of delivered. These two books are a clear evidence of the effective utilization of the Woreda information centers.

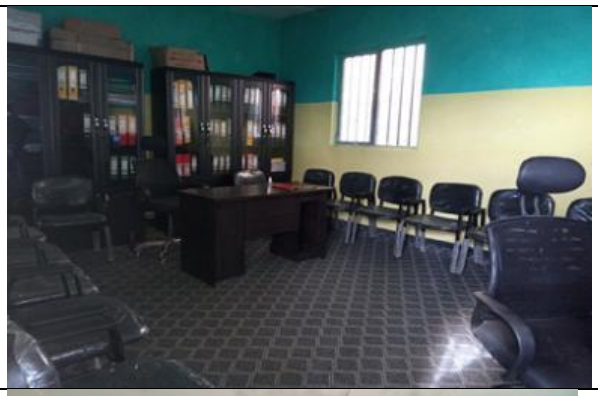
Table 104: verification for WIC Recording mechanisms to capture visitors' names

Region	Woreda Information Center (WIC)	Recording mechanisms to capture visitors' names	Building Status	
			Yes	No
Gambela	Mengeshi	Registry book	√	
		Posted center working hours	√	
Benishangul Gumuz	Assossa	Registry book	√	
		Posted center working hours	√	
	Homosha	Registry book	√	
		Posted center working hours	√	
Sidama	Hawassa Zuria	Registry book	√	
		Posted center working hours	√	
Amhara	Dangila	Registry book	√	
		Posted center working hours	√	
	Bure Zuria	Registry book	√	
		Posted center working hours	√	
	Bibugn	Registry book	√	
		Posted center working hours	√	
	Debay Tena	Registry book	√	
		Posted center working hours	√	
	Enarj Enawga	Registry book	√	
		Posted center working hours	√	
	Baso Liben	Registry book	√	
		Posted center working hours	√	
SNNP	Hulberag	Registry book	√	
		Posted center working hours	√	
	Gibe	Registry book	√	
		Posted center working hours	√	
	Miran Azanech	Registry book	√	

		Posted center working hours	√	
	Endagne	Registry book	√	
		Posted center working hours	√	
	Gumer	Registry book	√	
		Posted center working hours	√	
	Oyda	Registry book	√	
		Posted center working hours	√	
	Geze Gofa	Registry book	√	
		Posted center working hours	√	
Oromia	Tiyo	Registry book	√	
		Posted center working hours	√	
	Haramaya	Registry book	√	
		Posted center working hours	√	
	Enjere	Registry book	√	
		Posted center working hours	√	
	Wanch	Registry book	√	
		Posted center working hours	√	
	Gumay	Registry book	√	
		Posted center working hours	√	
	Mana	Registry book	√	
		Posted center working hours	√	
	Kersa	Registry book	√	
		Posted center working hours	√	
	Bayisu	Registry book	√	
		Posted center working hours	√	

Source: 2021 RLLP WIC assessment tool.

3.4.13 Photographs summarizing the functionality & effective utilization of the WICs



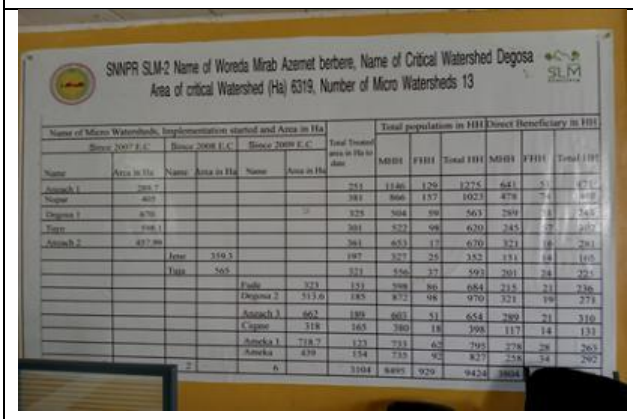
GEZE GOFA WOREDA
SLMP P.I.U.P

የዘላቂ መሬት አያያዝ
ፕሮጀክት መረጃ ማዕከል
Sustainable Land Management
Project Information Center

KONKA

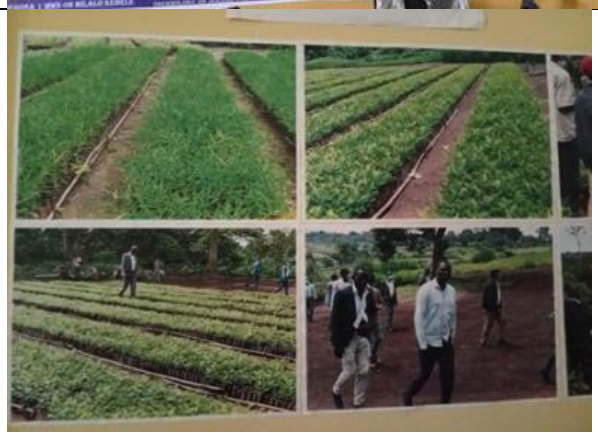
SLM


Discussions with community
Training on nursery site establishment, seedling production & SWC structure construction
Experience sharing
2007 E.C
2009 E.C

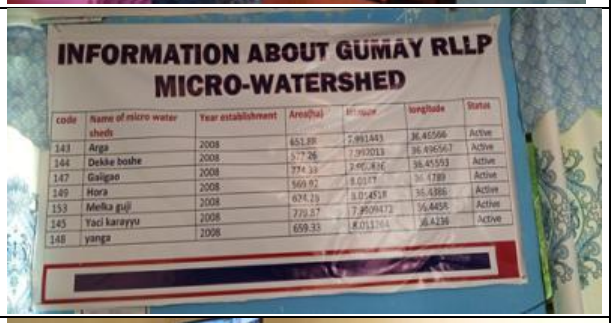

SNNPR SLM-2 Name of Woreda Mirab Azernet berbere, Name of Critical Watershed Degosa
Area of critical Watershed (Ha) 6319, Number of Micro Watersheds 13
SLM


MIRAB AZERNET BERBERE WOREDA SUSTAINABLE LAND MANAGEMENT PROJECT PHASE THREE/RLLP/
SOIL AND WATER CONSERVATION ACTIVITIES ON FARM LAND
BILALO KEBELE

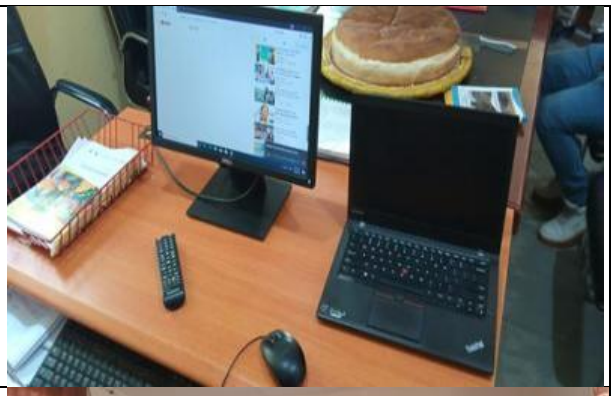

SLMP/RLLP K/S-04
መንገሺ ወረዳ እርሻና ተፈጥሮ ሀብት ልማት ጽ/ቤት
ዘ.መ.አ.ፕ.መረጃ ማዕከል ከሰኞ-ሐሙስ ክፍት የሚሆንበት ሰዓት፡
Mengeshi Woreda Agriculture & Natural Resource Office(SLMP) Information Center
Monday- Thursday Open time:-
ጧት ኢ.ት ሰዓት
Morning local time
2:30- 6:30
ከሰዓት ኢ.ት ሰዓት
After noon local time
7:30-11:30
አርብ(Friday) ጧት ኢ.ት ሰዓት
Morning local time
2:30- 5:30
አርብ(Friday) ሰዓት ኢ.ት ሰዓት
After noon local time
-




Well Come to
RLLP
Information Center


INFORMATION ABOUT GUMAY RLLP
MICRO-WATERSHED
code
Name of micro water sheds
Year establishment
Area(ha)
longitude
Status
143 Arga 2008 Active
144 Dekke boshe 2008 Active
147 Gaiigao 2008 Active
149 Hora 2008 Active
153 Melka guji 2008 Active
145 Yaci karayyu 2008 Active
148 yanga 2008


Giddu gala odeeffanno sagantaa
RLLP/SLMPII Aanaa Qarsaa
(Kersa Woreda SLMPII/RLLP
Information Center)




giz
MINISTRY OF AGRICULTURE (MOA) SUSTAINABLE LAND MANAGEMENT
PROGRAM (SLMP) INFORMATION CENTER OFFICE
W/ra B/Q/ fi QQU Aana Mannatt Wirtu Odeeffanno Dhaabata
SLM/RLLP/


TIYO WOREDA INFORMATION CENTER
Established in 2012 EC

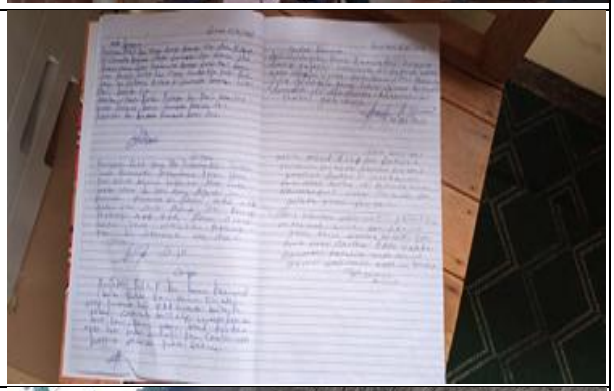



Photo Galarry Of Tiyo Woreda
RLLP/SLMP 2012 and 2013
Project year Activity
2013 E.C Activity Potho Galarry


giz
Sustainable Land Management Project (SLMP-II)
Wonchi Woreda Information Center Office
Giddu-gala Odeeffannoo Aanaa Wanchi


2012

3.5 Climate change awareness.

Climate is the **description of the long-term pattern of weather in a particular area**. Some scientists define climate as the average weather for a particular region and time period, usually taken over 30-years. Climate change on the other describes a change in the average conditions-such as temperature and rainfall-in a region over a long period of time. The survey undertook a slight assessment on the awareness of climate and climate change as a way of preparing for phase II of the RLLP where one of its components will focus on climate change. The section describes the awareness of climate among the beneficiaries of the RLLP.

3.5.1 Awareness of elements of weather (Regional analysis)

The level of awareness of the different elements of weather is generally low especially in Amhara, Benshangul Gumuzi and Gambela. The rate of awareness is relatively high in SNNPR with the rate of awareness of fog & snow at 46%, sunshine at 45% and temperature at 30; Sidama and Oromia. Within the regions, rainfall is the element of weather with Oromia taking a lead in the awareness of rainfall (46.5%), followed by Amhara (44%) and Benshangul Gumuz (27.3%). The table below describes the level of awareness of the different elements of weather.

Table 105: Awareness of elements of weather within and across the regions

Awareness on the elements of weather		Region of the respondent																	
		Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR		
		Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %
Sunshine	No	1035	49.1	97.0	123	5.8	43.6	61	2.9	60.4	572	27.1	54.4	63	3.0	23.2	254	12.0	24.9
	Yes	32	1.9	3.0	159	9.4	56.4	40	2.4	39.6	480	28.5	45.6	209	12.4	76.8	766	45.4	75.1
Temperature	No	278	16.9	26.1	135	8.2	47.9	22	1.3	21.8%	744	45.3	70.7	90	5.5	33.1	372	22.7	36.5
	Yes	789	36.6	73.9	147	6.8	52.1	79	3.7	78.2	308	14.3	29.3	182	8.5	66.9	648	30.1	63.5
Fog &	No	942	29.8	88.3	264	8.4	93.6	89	2.8	88.1	916	29.0	87.1	223	7.1	82.0	725	23.0	71.1
Snow	Yes	125	19.7	11.7	18	2.8	6.4	12	1.9	11.9	136	21.4	12.9	49	7.7	18.0	295	46.5	28.9
Humidity	No	694	28.2	65.0	186	7.6	66.0	83	3.4	82.2	763	31.0	72.5	178	7.2	65.4	557	22.6	54.6
	Yes	373	28.0	35.0	96	7.2	34.0	18	1.4	17.8	289	21.7	27.5	94	7.1	34.6	463	34.7	45.4
Rainfall/precipitation	No	598	34.4	56.0	205	11.8	72.7	54	3.1	53.5	516	29.7	49.0	75	4.3	27.6	291	16.7	28.5
	Yes	469	22.8	44.0	77	3.7	27.3	47	2.3	46.5	536	26.1	51.0	197	9.6	72.4	729	35.5	71.5
Atmospheric pressure	No	1038	31.6	97.3	242	7.4	85.8	84	2.6	83.2	970	29.5	92.2	197	6.0	72.4	756	23.0	74.1
	Yes	29	5.7	2.7	40	7.9	14.2	17	3.4	16.8	82	16.2	7.8	75	14.8	27.6	264	52.1	25.9

Wind (speed and direction)	No	988	29.7	92.6	274	8.2	97.2	76	2.3	75.2	933	28.1	88.7	200	6.0	73.5	853	25.7	83.6
	Yes	79	16.8	7.4	8	1.7	2.8	25	5.3	24.8	119	25.3	11.3	72	15.3	26.5	167	35.5	16.4

Source: 2021 RLLP beneficiary household questionnaire.

3.5.2 Awareness of the elements of the weather across the AEZ.

The rate of awareness of climate and elements of weather is higher among watersheds in Weyena Dega, followed by watersheds in Dega and then followed by Watersheds in Upper kola. Temperature, rainfall, sunshine are the most commonly known elements of weather in all the Agroecological zones. Table below describes the rate of awareness of the different elements of weather across the different agroecological zones.

Table 106: Awareness of the elements of weather across the different AEZs

Human activities that may lead to climate change		Agro-ecological zone of the watershed								
		Dega			Upper Kolla,			Weyena Dega		
		Count	Row N %	Column N %	Count	Row N %	Column N %	Count	Row N %	Column N %
Sunshine (solar radiation)	No	1055	50.0	65.3	136	6.5	46.3	917	43.5	48.6
	Yes	560	33.2	34.7	158	9.4	53.7	968	57.4	51.4
Warmth & coldness of an area (temperature)	No	700	42.7	43.3	132	8.0	44.9	809	49.3	42.9
	Yes	915	42.5	56.7	162	7.5	55.1	1076	50.0	57.1
Fog & Snow	No	1320	41.8	81.7	269	8.5	91.5	1570	49.7	83.3
	Yes	295	46.5	18.3	25	3.9	8.5	315	49.6	16.7
Amount of water vapor in the atmosphere (humidity)	No	1038	42.2	64.3	207	8.4	70.4	1216	49.4	64.5
	Yes	577	43.3	35.7	87	6.5	29.6	669	50.2	35.5
Rainfall/precipitation (type, frequency, and amount)	No	743	42.7	46.0	184	10.6	62.6	812	46.7	43.1
	Yes	872	42.4	54.0	110	5.4	37.4	1073	52.2	56.9
Atmospheric pressure	No	1432	43.6	88.7	240	7.3	81.6	1615	49.1	85.7
	Yes	183	36.1	11.3	54	10.7	18.4	270	53.3	14.3
Wind (speed and direction)	No	1414	42.5	87.6	261	7.9	88.8	1649	49.6	87.5
	Yes	201	42.8	12.4	33	7.0	11.2	236	50.2	12.5

Source: 2021 RLLP beneficiary household questionnaire.

3.5.3 Human activities that may lead to climate change

A number of activities were reported by the different household heads as activities that may lead to climate change. In both male and female headed households, Deforestation, Overgrazing, and Bush burning were highly reported as human activities that may lead to climate change. Practicing deforestation is high in both male and female headed households (90.4% & 87.0%), followed by dumping (29.5% for male headed households) and (30.1% for female headed households) and then followed by bush burning (20.7% for male headed & 22.8% for female headed households

The table below illustrates how female and male headed households reported on human activities that may lead to climate change.

Table 107: Human activities that leads to climate change.

		Category of household					
		Female headed household			Male headed household		
		Count	Row %	Col %	Count	Row %	Col %
Deforestation	No	118	36.5	13.0	205	63.5	9.6
	Yes	790	29.1	87.0	1928	70.9	90.4
Overgrazing	No	286	33.3	31.5	574	66.7	26.9
	Yes	622	28.5	68.5	1559	71.5	73.1
Dumping of plastics and nondegraded materials	No	635	29.7	69.9	1504	70.3	70.5
	Yes	273	30.3	30.1	629	69.7	29.5
Regular use of polyethene bags	No	770	29.7	84.8	1824	70.3	85.5
	Yes	138	30.9	15.2	309	69.1	14.5
Bush burning	No	701	29.3	77.2	1692	70.7	79.3
	Yes	207	31.9	22.8	441	68.1	20.7
Air pollution from industrial emissions	No	716	31.0	78.9	1591	69.0	74.6
	Yes	192	26.2	21.1	542	73.8	25.4

Source: 2021 RLLP beneficiary household questionnaire.

3.5.4 Households involvement in activities that may lead to climate change.

The survey examined whether the RLLP project beneficiaries have participated in any of the activities that may lead to climate change. The findings of the study that for both male and female headed household, the rate of participation in activities that may result in climate change was over 80%.

Table 108: the rate of participation in activities that may lead to climate change.

		Category of household							
		Female headed household				Male headed household			
		Count	Row N %	Column N %	Table Total N %	Count	Row N %	Column N %	Table Total N %
Participation in	No	163	27.5	14.4	4.3	430	72.5	16.1	11.3
	Yes	967	30.2	85.6	25.5	2234	69.8	83.9	58.9

Source: 2021 RLLP beneficiary household questionnaire.

3.5.5 Willing to stop practices that may lead to climate change.

The findings of the survey indicated that despite the high rate of participating in activities that may lead to climate change; the willingness to change and drop such activities is equally high in both male and female headed households, provided there better alternative sources of livelihood. as illustrated in the table below. Therefore, suitable interventions to curb climate change should be properly designed and implemented in phase two of RLLP to curb climate change

Table 109: Willingness to drop activities that may lead to climate change.

		Category of household							
		Female headed household				Male headed household			
		Count	Row N %	Column N %	Table Total N %	Count	Row N %	Column N %	Table Total N %
Willingness to drop activities that may lead to climate change.	No	82	33.9	7.3	2.2	160	66.1	6.0	4.2
	Yes	1048	29.5	92.7	27.6	2504	70.5	94.0	66.0

Source: 2021 RLLP beneficiary household questionnaire.

3.5.6 Assessment of whether the expectations of the beneficiaries are met or not.

Survey respondents were asked whether their expectations are met or not. The findings of the study indicated that 88.8% of female headed households had all their expectations met; while 63.4% of the male headed households had all their expectations met. The table below describes the rate of beneficiaries who reported that expectations of the project are met.

Table 110: Reponses on whether the expectations are met

		Category of household							
		Female headed household				Male headed household			
		Count	Row N %	Column N %	Table Total N %	Count	Row N %	Column N %	Table Total N %
Whether all beneficiaries' expectations are met or not	No.	126	32.6	11.2	3.	260	67.4	9.8	6.9
	Yes	1004	29.5	88.8	26.5	2404	70.5	90.2	63.4

Source: 2021 RLLP beneficiary household questionnaire.

4 LESSONS LEARNT

Note that programs and projects like sustainable land management and RLLP combine a number of aspects such as technologies, policies, and activities aimed at integrating socioeconomic principles with environmental concerns, so as to simultaneously: maintain and enhance production (productivity), reduce the level of production risk, and enhance soil capacity to buffer against degradation processes (stability/resilience). This section presents a number of lessons learned from the implementation of the first half of RLLP.

a) Long-term commitment to maintain the quality of natural resources.

The assessment discovered that maintaining quality of natural resources requires a long-term commitment. This is because the benefits of such interventions tend to increase as time goes on after the interventions have been established. This is clearly illustrated by the difference in benefits and adoption of livelihood diversification between SLMP-I/II and RLLP. The benefits and rates of adoption are higher in SLMP-II and SLMP-I compared to RLLP and this is explained by the fact that SLMP-I and II have had enough time to realize such benefits compared to watersheds in RLLP.

b) Integration of the four common principles in implementing projects of this kind.

The implementation of projects like RLLP has generated a lesson of working on the four common principles. These include land-user-driven and participatory approaches; integrated use of natural resources at ecosystem and farming systems levels; multilevel and multi-stakeholder involvement; and targeted policy and institutional support, including development of incentive mechanisms for the success of the project. In an effort to achieve the intended RLLP project objectives and obtained high scores in each of the selected indicators, the project implementation team adopted a four based principle approach, where land users were given the opportunity to participate in the interventions of their respective interests as well as interventions that suit the

c) Knowledge management information system (Excel + KMIS based)

The design and utilization of such a monitoring and evaluation system is great lesson for this and other programs/projects to be implemented in the future. This is system is not only efficient in capturing and monitoring progress of the project implementation activities, but also eases the rate of sharing information, allowing quick reactions incase adjustments are needed. The fact that anybody can access information wherever they are as long they have the password to the system is an added advantage in this digital era and has greatly fitted in the current new way of undertaking activities with minimal physical contact due to the covid-19 pandemic.

Other lessons learnt include:

- Bylaws in various CIGs have enabled them flourish for example in the kilissa CIG in oroma region, if a member doesn't adhere to the rules like paying contribution or labor or create trouble, they are fined and if they don't stop they are expelled from the group. In Fagita woreda, Guder water shed if a member isn't present during field work he /she will be sanctions 5 birr. They contribute 50 birr every month each member to encourage themselves to meet once a month they save this money in the bank.

- Exchange of experiences from other woredas has worked for the woredas lagging behind as they copy methods that have worked well for other woredas and take them on as well.

- Different levels of committees such as community watershed committee, kebele level watershed committee, technical committee at woreda level, and steering committee at woreda level. These have proved to have worked well especially in organizing activities and project implementation in the areas where they exist. These committees also help in information dissemination as well as training in project activities.

- Areas with no woreda information centers yet, disseminate information through development agents or through committee members or directly to the community from focal person. Though there's need for incentives, this has worked well for the farmers to get relevant and vital project information.

5 SUSTAINABILITY

Assessing the sustainability of projects like SLMP/RLLP is a very important aspects and requires critical attention. Therefore, the assessment of sustainability on this assignment was based on the objectives of: productivity, stability/resilience, protection, viability, and acceptability/equity (Smyth and Dumanski, 1993). The definition and pillars have been field tested in several countries, and they were judged to provide useful guidance to assess sustainability. The section below presents findings of the assessment as far as the RLLP project sustainability is concerned.

a) Collective efforts of all the stakeholders.

The findings of the survey indicated that a number of stakeholders have greatly contributed in the implementation of the project and every stakeholder's role is clear in the project implementation manual. For instance the implementation structure the project has funders-whose roles and responsibilities are clearly stipulated, the Federal steering committee, the Federal (National project coordination unit), the regional steering committee, the regional coordination unit, the Woreda Watershed Technical Committee (WTC), Woreda Steering Committee (WSC), Woreda Technical Committee (WTC),Woreda Focal Persons (WFP), Kebele Watershed Team (KWT), Keble Land Administration and Use Committee, Community watershed teams, Members of households who belong to facility user groups who were organized and supported by the SLMP among others. All the above stakeholders have played their role to create a conducive environment to enable the beneficiaries reap benefits from the project and as a result contribute to the sustainability of the project.

b) The integration of economic and environmental interests in a comprehensive manner.

SLMP/RLLP was found to have integrated a number of aspects and interests. These include and economic and environmental interests. The different components and sub components of the project such as adoption of non-traditional livelihood activities, climate smart agriculture, sustainable land management practices, data management and information centers, improvement in productivity and incomes, encouraging the participation in the selection and prioritization of the project interventions as well as designing interventions based on agroecological zones are all important indicators that the project has so far performed well as far as sustainability is concerned.

c) Emphasis of sustainable land management

The project has greatly emphasized the aspects sustainable land management practices and technologies. Sustainable land management practices have both economic and environmental benefits, which are always a foundation (linch pin) for further rural interventions (investments). Without such sustainable land management practices like planting pasture along the gardens, agroforestry among others, other interventions in the rural sector are not likely to yield expected results.

d) Encouraging intensive farming.

The findings of the study indicate that RLLP has greatly encouraged intensive framing. RLLP has encouraged and promoted a shift from traditional agricultural to higher value production, or higher yields with more inputs per unit of production and higher standards of management. This was done by promoting the optimization of efficiency of external inputs rather than trying to maximize

yields. For example, the emphasis and adoption of vegetable growing in Mengeshi-Gambela, Assosa-Benshangul Gumuz, coffee growing in Hawassa Zuria-Sidama among others

e) Sharing of experiences and inclusiveness.

The project implementation unit does not impose interventions on the farmers. They have rother created an enabling environment through policy interventions where farmers are freer and more empowered to make the right choices. The regional and Woreda Governments have tried to ensure that their policies and programs do not create negative environmental impacts. The fact that such policies have been embraced by the project beneficiaries, is an indication that the RLLP project interventions are destined to be sustainable.

f) Establishment of fully functional & equipped Woreda information centers

This is a very important component of sustainability. The centers help the project implementation teams acquire information and technical assistance that enhance their skill and knowledge thereby raising awareness on new SLM practices. The centers also serve as repositories for data, information, communication and knowledge products related to SLM/NRM and agricultural development. With this kind of arrangement, the project interventions and resources are secure and safe for a longer period of time hence credit to the program design for coming up with such a sustainability component

6 EXISTING CHALLENGES

6.1 Challenges affecting the adoption of non-traditional income generating activities and technologies

a) Gender of the household head and its influence on adoption

The survey discovered that the adoption of the different livelihood activities is affected by the gender of the household head. Male headed households were found to have adopted on-farm livelihood activities compared to their female headed household counterparts. KIIs and FGDs reported that male-headed households have more productive labor and asset ownership than their female counterparts when it comes to on-farm activities. Female-headed households can be characterized by a lack of access to asset ownership and adequate labor to pursue on-farm activities hence generally affecting the rate of adoption of nontraditional livelihood activities.

b) Low profitability and efficiency of fertilizer use due to the lack of complimentary improved practices and seed, and lack of irrigation and water constraints.

Despite the general increase in the productivity and incomes as a result of diversifying livelihood activities across the region, the rate of increase in output and income from the specific on-farm, off-farm and non-farm income generating activities were found to be low. This discouraged some of the targeted beneficiaries especially youths to adopt nontraditional income generating activities and opt for other sources of livelihood like bajaj driving this was common in SNNPR., Gambela & Benshangul Gumuz

c) Long distance to markets

he assessment discovered that long distances to markets have affected the adoption and implementation of diversified livelihood activities. Key informant interviews in Mengeshi-Gambela Oromia, Amhara and Homosha-Benshangul Gumuz revealed that when some products, such as khat and charcoal, were directly sold at distant marketplaces they might have achieved higher prices than could have been obtained from local buyers. In addition, demand for these products might have been higher in distant markets than in closer ones. Once the cost of transporting products to the markets exceeds the amount of obtained from them, farmers will definitely drop such crops hence affecting the rate of adoption of nontraditional livelihood sources.

6.2 Challenges facing the adoption of sustainable land management practices.

a) Lack of community agreement to establish and maintain sustainable land management practices.

The assessment discovered that there is limited consensus and agreement on adopting sustainable land management practices in the different communities. for instance, when it comes to adopting area closures to limit open grazing. Some households require open grazing of cattle, while others want a cut-and-carry grazing technique. The two factors that influence the implementation of area closures in Beshangul and Gambela aree the size of the farmland and the number of cattle owned by a farmer. Farmers with a lot of animals and little or no land rely heavily on communal grazing and are opposed to the implementation of area enclosures. Farmers with enough land and fewer cattle, on the other hand, are more inclined to set up area enclosures since they can allocate a portion of the farmland for private grazing. Individuals with a big number of cattle are reluctant to employ a cut-and-carry grazing technique because it requires more labor and time to provide fodder grass for that number of animals.

b) Low rate of adoption of improved breeds of cattle.

The rate of rearing improved breeds of cattle is low in SNNPR, Sidama, Gambela and Benshangul, Majority of the farmers are engaged in local breeds. The sustainable land management practices such as Stall feeding, cut and curry, zero grazing are more suitable for improved breeds while the local breeds will require the traditional methods of rearing. The fact that majority of the farmers are engaged in the local breeds makes the adoption of sustainable land management practices difficult hence affecting the adoption and implementation of such technologies

c) Lack of the commitment to enforce community bylaws, rules and regulations.

Despite the formulation of community bylaws and regulations to govern sustainable land management. The rate at which these bylaws are implemented is low in almost all the regions that were assessed. The findings of this study show that failing to enforce community rules reduces the long-term viability of land management practices. Obeying community ordinances enacted to preserve land management techniques, notably grazing techniques, as well as to safeguard bush lands and forest remnants from illegal cutting, is a prominent problem. Participants in the focus group discussion and key informants explained that there are weaknesses in successfully enforcing community regulations because the community is sometimes uncooperative which eventually affects the adoption of sustainable land management practices

6.3 Challenges affecting the overall implementation of the RLLP project

a) Long distance between and within the different watersheds where the project is implemented.

The long distances from one major watersheds to another has greatly affected the implementation of the RLLP project activities. Some watersheds like the ones in Haramaya are over 580km from Oromia regional headquarters which makes monitoring and evaluation of the different project activities difficult.

b) The need for money by the community members to support the project interventions.

From the discussion and interviews with community members on their participation in the project, it was discovered most of the community leaders want to be given money to support the project activities, without money people tend to shy away from the project which has somehow affected the effective implementation of the project activities

c) Limited number of project personnel and staff.

It is important to note that there are a number of new regions that are being created in the country. These additional regions come with a lot of responsibility but in some cases the project responsibilities are always left to the staff in the mother region. This indirectly affects the implementation of the project activities.

Other challenges raised in KIIs and FGDs:

- As the population of the youth around the watershed areas grows, there is a shortage of agricultural land, especially communal holdings. The youth has no claim to the land.
- Poor infrastructure (e.g., rural roads, bridges) in the watershed areas makes it difficult for rural women to carry their products from their homes to market locations.
- Scarcity of agricultural inputs (e.g. quality seeds of vegetables)
- Scarcity of improved energy efficient cook stoves (MIRT cook stoves).

- Rural women did not get enough training about the entire project work. This caused a gap in the project's execution for rural women.
- The project did not let disabled women participate in the project due to the recruitment criteria.
- In each watershed area, rural women are underrepresented on the watershed committee.

7 RECOMMENDATIONS

e) Hiring of the extra staff and highly motivating staffs who are handling more than one region.

The assessment recommends hiring of extra support staff to support the implementation of the project activities especially in the new regions. If additional experts are not hired, then the remuneration of experts handling more than one region **should be doubled** to be motivated and effectively undertake the project activities

f) Increase awareness and sensitization.

Increase in awareness and sensitization activities especially in regions where community members need money to embrace the project interventions. All regional governments should take it upon themselves to educate their masses about the benefits of adopting sustainable land management practices as well as adopting livelihood diversification. This will increase the benefits of the project and contribute to the overall Project development objectives at the end of the project.

g) Increase the capacity of producing and supplying improved breeds of cattle and seeds as well as tree seedlings

This is to note that despite the fact that regions have the breeding places and centers, the capacity to continuously supply the improved seeds and breeds of cattle is still lacking. In an effort to increase the adoption of sustainable land management practices; the supply of livelihood activities that suit the different sustainable land management practices should be increased otherwise the adoption rate will remain low.

h) **Encourage equitable distribution and ownership of resources**

As indicated among the challenges, one of the limitations to adopting nontraditional income generating activities is shortage of land and other resources; the assessment strongly recommends that all stakeholders should be allowed to own productive resources to be able to increase the rate of adoption of nontraditional livelihood activities

Other recommendations from FGDs and KIIs

- Additional new and improved technology should be introduced by the project. For example, in some watersheds the water motars provided by project were not functioning well yet those who privately owned better motors the quality is good and more useful in Ejere woreda, women expressed need for water pumps for their irrigable lands so that they can improve household income by growing crops in the commonly called lean time. In this regard, other agricultural inputs should also be delivered on time and credit arrangements should be made for accessing them. Also, there complementary technologies should be provided for women
- More importantly, the youth suggested that, more diversified non-traditional activities should be included to employ the rural youth. They requested, in addition to sheep and goat fattening and poultry production, cattle and ox fattening (diary) should be included by the project to their potential and to have enough earnings.

- Different CIGs in different regions mentioned the need for more land for animal rearing as the land they currently had was small to diversify into animal raring yet it is a promising activity of income generation.
- Recruitment of more staff to help focal persons in implementation, training and supervision especially in the large woredas.
- Woreda information centres need to be set up in areas that don't have so as to ease communication and the search for information. For areas that have WIC but are not well equipped need to be equipped with necessary equipment and material to get the centres effectively running.
- Poultry raring and working in nurseries is highly recommended in most areas for women which requires less time for management and make profits.

8 CONCLUSIONS

Examining the achievement of RLLP on selected project indicators such as: PDO-5: Households adopting diversified livelihood activities supported by the project; PDO-5a: Female-headed households participating in diversified livelihood activities supported by the project; IR-1: Share of target beneficiaries with rating 'Satisfied' or above on project interventions (aspects: livelihoods, environmental benefits, others); IR1-a: Share of target women beneficiaries with rating 'Satisfied' or above on project interventions; IR-4: Land users adopting sustainable land management practices as a result of the project; IR-4a: Women land users adopting sustainable land management practices as a result of the project; IR-4b: Female headed households adopting sustainable land management practices as a result of the project; IR-8: Woredas Information Centers (WICs) being effectively used by project stakeholders that are used to measure the achievement of the Project Development Objective (DPO) of improving climate resilience, land productivity and carbon storage, and increase access to diversified livelihood activities in selected 136 rural watersheds in the highlands of Ethiopia; the findings of the study can confidently confirm that the project has so far achieved tremendous results all the indicators scores are very high with the least score being 58.4% and the highest score being over 80.5% as described in the different sections of the report showing the performance of the on the selected indicators.

In conclusions therefore, the different project implementation teams and funders are strongly encouraged to adopt the suggested possible recommendations in an effort to address the existing challenges that are to a small extent affecting the implementation and operationalization of the project related activities-which in the long run negatively reduce the rate at which the project is achieving its intended objectives.

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10 ANNEXES.

Annex 1: Study area and participants

The assignment was carried out in six regions of Amhara, Benshagul Gumuzi, Gambela, Oromia, Sidama, and SNNPR. The table below represents the number of households that were sampled in each of the region that was visited during the survey.

10.1.1 Regions where the assignment was conducted.

Region of the respondent	Frequency	Percent	Valid Percent	Cumulative Percent
Amhara	1067	28.1	28.1	28.1
Benishangul Gumuz	282	7.4	7.4	35.6
Gambela	101	2.7	2.7	38.2
Oromia	1052	27.7	27.7	65.9
Sidama	272	7.2	7.2	73.1
SNNPR	1020	26.9	26.9	100.0
Total	3794	100.0	100.0	

Source: 2021 RLLP beneficiary household questionnaire.

10.1.2 Phases of the project implementation

The survey was designed in a way that it captured watersheds and respondents in all the three phases of the program. These include SLMP-I, SLMP-II and RLLP. Note that in some regions, the program has only had two phases, while in some regions the program has had three phases, therefore regions which had two phases were only represented by two phases while regions that had three phases were fully represented by the three phases. The table below describes representation of the phases across the six regions where the survey was conducted.

	Region of the respondent																	
	Amhara			Benishangul Gumuz			Gambela			Oromia			Sidama			SNNPR		
Project phases	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %	Count	Row %	Col %
SLMP-I	422	27.9	39.6	179	11.8	69.9	67	4.4	66.3	588	38.8	55.9	89	5.9	32.7	169	11.2	16.6
SLIMP-II	439	23.7	41.1	77	4.1	30.1	34	1.8	33.7	349	18.8	33.2	183	9.9	67.3	774	41.7	75.9
RLLP	206	51.8	19.3	0	.0	.0	0	.0	.0	115	28.9	10.9	0	.0	.0	77	19.3	7.5

Source: 2021 RLLP beneficiary household questionnaire.

10.1.3 Major Watersheds where the assignment was carried out.

The survey focused on selecting respondents from the major watersheds.in each of the regions and in each phase. The table below describes the number of respondents in each of the major watersheds and their respective phases and regions.

Watersheds		Number of respondents	Col %
Watersheds in SLMP-I in Amhara	Dijil	96	22.75
	Guder	57	13.51
	Ketchem	75	17.77
	Ketech	66	15.64
	Yesir	72	17.06
	Yezat	56	13.27
	Total	422	100.0
Watersheds in SLMP-II in Amhara	Arefa	99	22.55
	Dendo	124	28.25
	Muga	129	29.38
	Yeda	87	19.82
	Total	439	100.0
Watersheds in SLMP-III/RLLP in Amhara	Awisi	121	58.74
	Chiye	85	41.26
	Total	206	100.0
Watersheds in SLMP-I in Benshangul Gumuzi	Hoha	84	46.93
	Sonka	95	53.07
	Total	179	100.0
Watersheds in SLMP-II in Benshangul Gumuz	Telku Sherkole	77	100.0
	Total	77	100.0
Watersheds in SLMP-I in Gambela	Ziey	67	100.0
	Total	67	100.0
Watersheds in SLMP-II in Gambela	Fejeji	34	100.0
	Total	34	100.0
Watersheds in SLMP-I in Oromia	Dolocha	170	28.91
	Halu deneba	52	8.84
	Nada	73	12.41
	Rebu	73	12.41
	Tilikulemen	59	10.03
	Water	115	19.56
	Wechecha	46	7.82
	Total	588	100.0
Watersheds in SLMP-II in Oromia	Berga	58	16.62
	Dedesa	83	23.78
	Gimbi	21	6.02
	Guya	45	12.89
	Harmaya	90	25.79
	Walga	52	14.90
	Total	349	100.0
Watersheds in SLMP-III/RLLP in Oromia	Ilu	115	100.0
	Total	115	100.0
Watersheds in SLMP-I in SNNPR	Azashuba	81	47.93

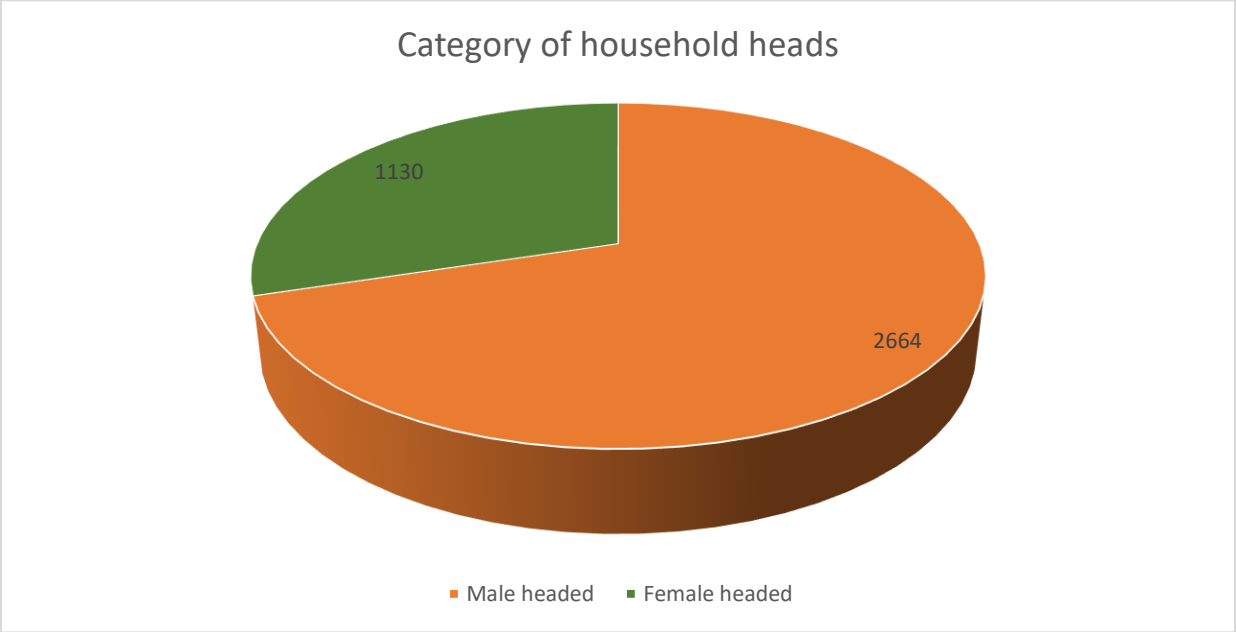
	Begeze	88	52.07
	Total	169	100.0
Watersheds in SLMP-II in SNNPR	Degosa	201	25.97
	Dijo	97	12.53
	Handosha	77	9.95
	Haram	90	11.63
	Mito	85	10.98
	Omo	95	12.27
	Wabe	70	9.04
	Zenti	59	7.62
	Total	774	100.0
Watersheds in SLMP-III/RLLP in SNNPR	Endegagn/Dibissa	77	100.0
	Total	77	100.0
Watersheds in SLMP-I in Sidama	Orisha G-eo	89	100.0
	Total	89	100.0
Watersheds in SLMP-II in Sidama	Jara Enesa	183	100.0
	Total	183	100.0
Watersheds in Upper Kolla AEZ	Fejeji	37	12.59
	Sonka	119	40.48
	Telku Sherkole	78	26.53
	Ziey	60	20.41
	Total	294	100.0
Watersheds in Dega	Arefa	99	6.13
	Awisi	115	7.12
	Chiye	91	5.63
	Dedesa	100	6.19
	Degosa	206	12.76
	Dibissa	65	4.02
	Dijil	95	5.88
	Gimbi	21	1.30
	Haram	90	5.57
	Harmaya	90	5.57
	Ketchem	74	4.58
	Ketech	71	4.40
	Muga	128	7.93
	Nada	73	4.52
	Tilikulemen	59	3.65
	Wabe	70	4.33
	Walga	53	3.28
	Water	115	7.12
	Total	1615	100.0
Watersheds in Weyena Dega	Aleltu	1	0.05
	Awuga	1	0.05
	Azashuba	80	4.24
	Begeze	88	4.67
	Berga	60	3.18
	Dendo	123	6.53
	Dijo	96	5.09
	Dolocha	159	8.44

	Guder	52	2.76
	Guya	45	2.39
	Halu deneba	53	2.81
	Handosha	77	4.08
	Hawassa Zuria	196	10.40
	Hoha	84	4.46
	Ilu	115	6.10
	Matizirgi	1	0.05
	Mito	85	4.51
	Nagesso	1	0.05
	Omo	94	4.99
	Orisha G-eo	76	4.03
	Rebu	69	3.66
	Wechecha	46	2.44
	Yedo	89	4.72
	Yesir	134	7.11
	Zenti	60	3.18
	Total	1885.00	100.0

Source: 2021 RLLP beneficiary household questionnaire.

10.1.4 Households disaggregated by sex of the household head

The figure below describes the number of male and female headed households that was sampled for the survey. 1130 female headed households participated in the survey while 2664 male headed households participated in the survey.



Source: 2021 RLLP beneficiary household questionnaire.

Annex 2: Demographic characteristics of the respondents

10.2.1 Sex of the respondent.

The survey consultant team was cognizant of the fact that the sustainable land management program targeted both Male and females; male headed and female headed households. Therefore, during the sampling of the study participants, both male and females were considered and 37.7% of the respondents were female while 62.3% were males. The table below illustrates the disaggregation of the respondents based on sex.

Sex of the respondent	Frequency	Percent	Valid Percent
Female	1431	37.7	37.7
Male	2363	62.3	62.3
Total	3794	100.0	100.0

Source: 2021 RLLP beneficiary household questionnaire.

10.2.2 Age of respondents

The findings of the survey indicate that the average age of the survey respondents is 41.9 approximately 42; the minimum age is 18 while the maximum age was 96. The table below summarizes the age of the respondents

Age of the respondent	N	Minimum	Maximum	Mean	Std. Deviation
Valid N (listwise)	3794 3794	18	96	41.90	11.872

Source: 2021 RLLP beneficiary household questionnaire.

10.2.3 Marital status of the respondent.

The findings of the survey indicate that majority of the survey participants were married; this is represented by 87.7% as illustrated in the table below.

Marital status	Frequency	Percent	Valid Percent
Married	3326	87.7	87.7
Single	468	12.3	12.3
Total	3794	100.0	100.0

Source: 2021 RLLP beneficiary household questionnaire.

10.2.4 Household size.

Majority of the respondents reported the size of the households to be between 3 to 8. The table below represents how different respondents reported about their respective household sizes.

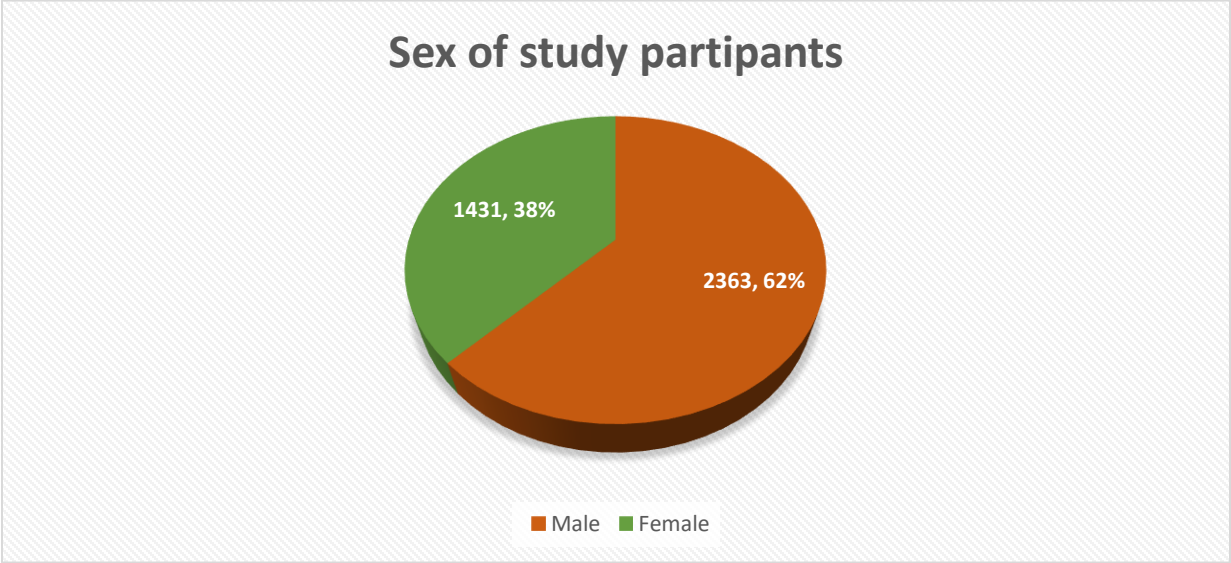
Household size	Frequency	Percent	Valid Percent	Cumulative Percent
0	11	.3	.3	.3
1	38	1.0	1.0	1.3

2	161	4.2	4.2	9.8
3	385	10.1	10.1	19.9
4	558	14.7	14.7	34.6
5	711	18.7	18.7	53.3
6	704	18.6	18.6	71.9
7	513	13.5	13.5	85.4
8	377	9.9	9.9	95.4
9	176	4.6	4.6	100.0
10	160	4.2	4.2	5.5
Total	3794	100.0	100.0	

Source: 2021 RLLP beneficiary household questionnaire.

10.2.5 Sex of the respondents

The survey interviewed a total of 2363 males representing 62% while 38% of the survey respondents were females. The figure below describes the sex of the survey respondents



Source: 2021 RLLP beneficiary household questionnaire.

10.2.6 Number of Males vs females in the households

Number of Males	Frequency	Percent	Valid Percent	Cumulative Percent
0	85	2.2	2.2	2.2
1	592	15.6	15.6	17.8
2	1071	28.2	28.2	46.1
3	989	26.1	26.1	72.2
4	652	17.2	17.2	89.4
5	254	6.7	6.7	96.0

6	101	2.7	2.7	98.7
7	41	1.1	1.1	99.8
8	8	.2	.2	100.0
10	1	.0	.0	17.9
Total	3794	100.0	100.0	

Source: 2021 RLLP beneficiary household questionnaire.

Number of Females	Frequency	Percent	Valid Percent	Cumulative Percent
0	37	1.0	1.0	1.0
1	559	14.7	14.7	15.7
2	1058	27.9	27.9	43.6
3	1067	28.1	28.1	71.7
4	611	16.1	16.1	87.8
5	306	8.1	8.1	95.9
6	110	2.9	2.9	98.8
7	37	1.0	1.0	99.8
8	9	.2	.2	100.0
Total	3794	100.0	100.0	

Source: 2021 RLLP beneficiary household questionnaire.

10.2.7 Literacy level.

Literacy Status	Frequency	Percent	Valid Percent	Cumulative Percent
Illiterate	1869	49.3	49.3	49.3
Literate (can read and write)	1925	50.7	50.7	100.0
Total	3794	100.0	100.0	

Source: 2021 RLLP beneficiary household questionnaire.

10.2.8 Land ownership.

Respondents were asked if any member of their households owned land; 88.7% of the respondents reported that at least a member of the household owned land

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	427	11.3	11.3	11.3
	Yes	3367	88.7	88.7	100.0
	Total	3794	100.0	100.0	

Source: 2021 RLLP beneficiary household questionnaire.

The respondents who reported that at least any member of the households owned land were asked how many members of the households owned land; and the findings of the survey that on average not more than two members of household's own land. This is in line with findings of the FGDs which reported that land is mainly owned by the heads of the households. The table below illustrates how respondents reported about land ownership in their respective households

If yes above, how many members of this household own land

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		429	11.3	11.3	11.3
	0	13	.3	.3	11.6
	1	2133	56.2	56.2	67.9
	2	1062	28.0	28.0	95.9
	3	91	2.4	2.4	98.3
	4	29	.8	.8	99.0
	5	20	.5	.5	99.6
	6	6	.2	.2	99.7
	7	7	.2	.2	99.9
	8	2	.1	.1	99.9
	9	2	.1	.1	100.0
	Total	3794	100.0	100.0	

Source: 2021 RLLP beneficiary household questionnaire.

10.2.9 Youth ownership of land

The findings of the survey show that majority of the youths do not own land. The survey respondents were asked about the number of youths (between 15-29) who owned land and 61% of respondents reported that none of youths in their respective households owned land. The table below illustrates how household heads reported about the ownership of land by youths.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		458	12.1	12.1	12.1
	0	2328	61.4	61.4	73.4
	1	630	16.6	16.6	90.0
	2	260	6.9	6.9	96.9
	3	75	2.0	2.0	99.2
	4	16	.4	.4	99.6
	5	11	.3	.3	99.9
	8	2	.1	.1	100.0
	18	1	.0	.0	90.1
	20	2	.1	.1	97.0
	23	2	.1	.1	97.0
	25	2	.1	.1	97.1

28	3	.1	.1	97.2
29	3	.1	.1	97.2
40	1	.0	.0	99.7
Total	3794	100.0	100.0	

Source: 2021 RLLP beneficiary household questionnaire.

10.2.10 Adoption of SLM practices compared with literacy levels

Awareness of sustainable land management practices		Q111: Literacy level					
		Illiterate			Literate (can read and write)		
		Count	Row N %	Column N %	Count	Row N %	Column N %
Q501: Are you aware of any sustainable land management practices that have been promoted by RLLP?	No	202	60.5	10.8	132	39.5	6.9
	Yes	1667	48.2	89.2	1793	51.8	93.1

Source: 2021 RLLP beneficiary household questionnaire.

10.2.11 Literacy level compared with adoption of SLM practices

Sustainable land management practices		Q111: Literacy level					
		Illiterate			Literate (can read and write)		
		Count	Row N %	Column N %	Count	Row N %	Column N %
Agronomic practices		202	60.5	10.8	132	39.5	6.9
(Mulching, intercropping, fertilizer application, crop rotation etc.)	No	170	45.9	9.1	200	54.1	10.4
	Yes	1497	48.4	80.1	1593	51.6	82.8
Vegetative practice		202	60.5	10.8	132	39.5	6.9
(planting of perennial vegetation such as trees, shrubs, grasses, legumes etc.)	No	481	53.0	25.7	427	47.0	22.2
	Yes	1186	46.5	63.5	1366	53.5	71.0
Land structural measures (physical constructions (canals, terraces, trenches etc.) to reduce hazards)	No	202	60.5	10.8	132	39.5	6.9
	Yes	423	49.2	22.6	437	50.8	22.7
	No	1244	47.8	66.6	1356	52.2	70.4
Land management measures (Land	Yes	202	60.5	10.8	132	39.5	6.9
	No	910	49.6	48.7	924	50.4	48.0

registration, land certification, conservation grazing)	Yes	757	46.6	40.5	869	53.4	45.1

Source: 2021 RLLP beneficiary household questionnaire.

10.2.12 Literacy level and adoption of technologies

Different technologies promoted by sustainable land management program		Q111: Literacy level					
		Illiterate			Literate (can read and write)		
		Count	Row N %	Column N %	Count	Row N %	Column N %
Soil and water conservation (SWC), (Mulching, terraces, etc.)	No	186	51.0	10.0	179	49.0	9.3
	Yes	1683	49.1	90.0	1746	50.9	90.7
Agroforestry,	No	902	50.1	48.3	897	49.9	46.6
	Yes	967	48.5	51.7	1028	51.5	53.4
Climate-smart agriculture (CSA) such as controlled grazing,	No	663	51.3	35.5	630	48.7	32.7
	Yes	1206	48.2	64.5	1295	51.8	67.3
Moisture harvesting structures	No	627	41.6	33.5	879	58.4	45.7
	Yes	768	55.9	41.1	605	44.1	31.4
	No	474	51.8	25.4	441	48.2	22.9
	Yes	627	41.6	33.5	879	58.4	45.7
soil fertility management	No	732	53.5	39.2	636	46.5	33.0
	Yes	510	55.4	27.3	410	44.6	21.3

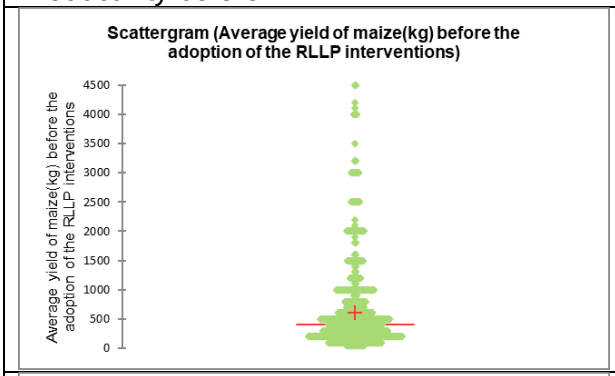
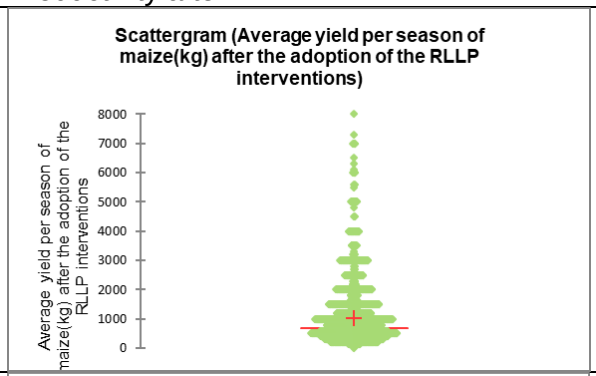
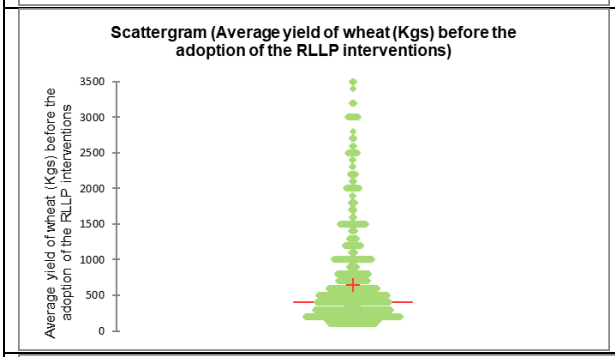
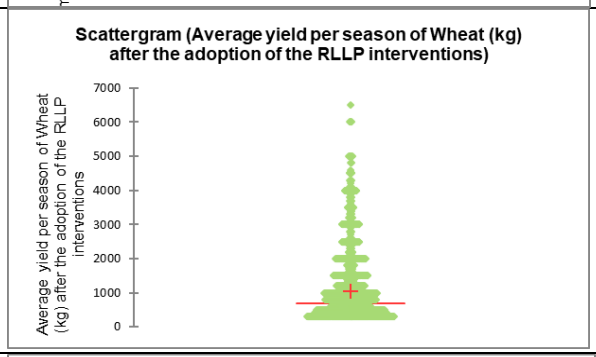
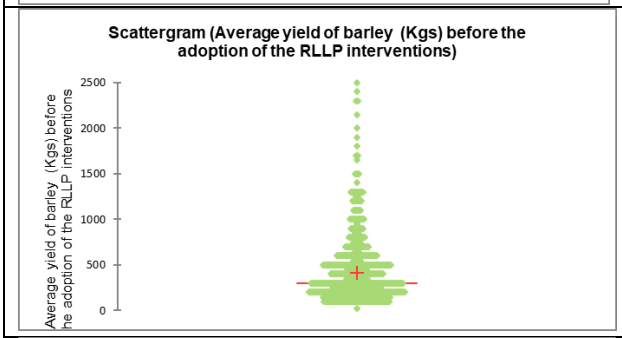
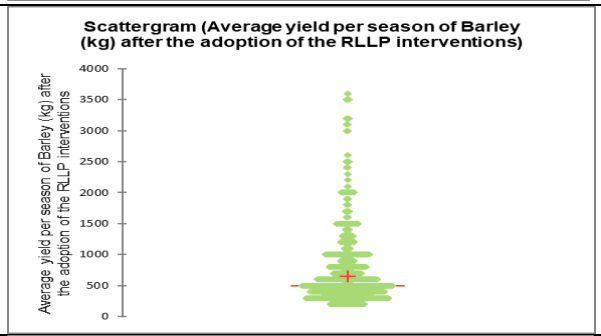
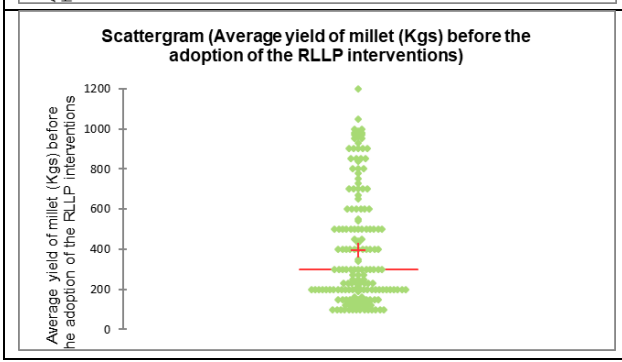
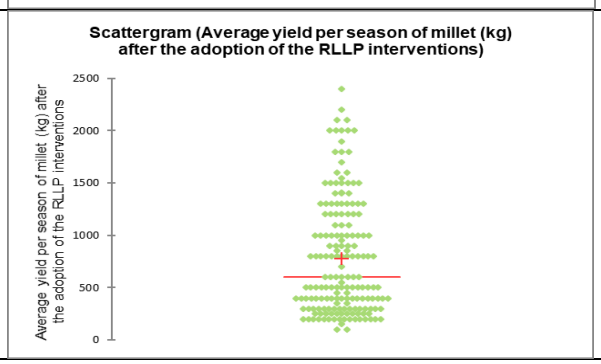
Source: 2021 RLLP beneficiary household questionnaire.

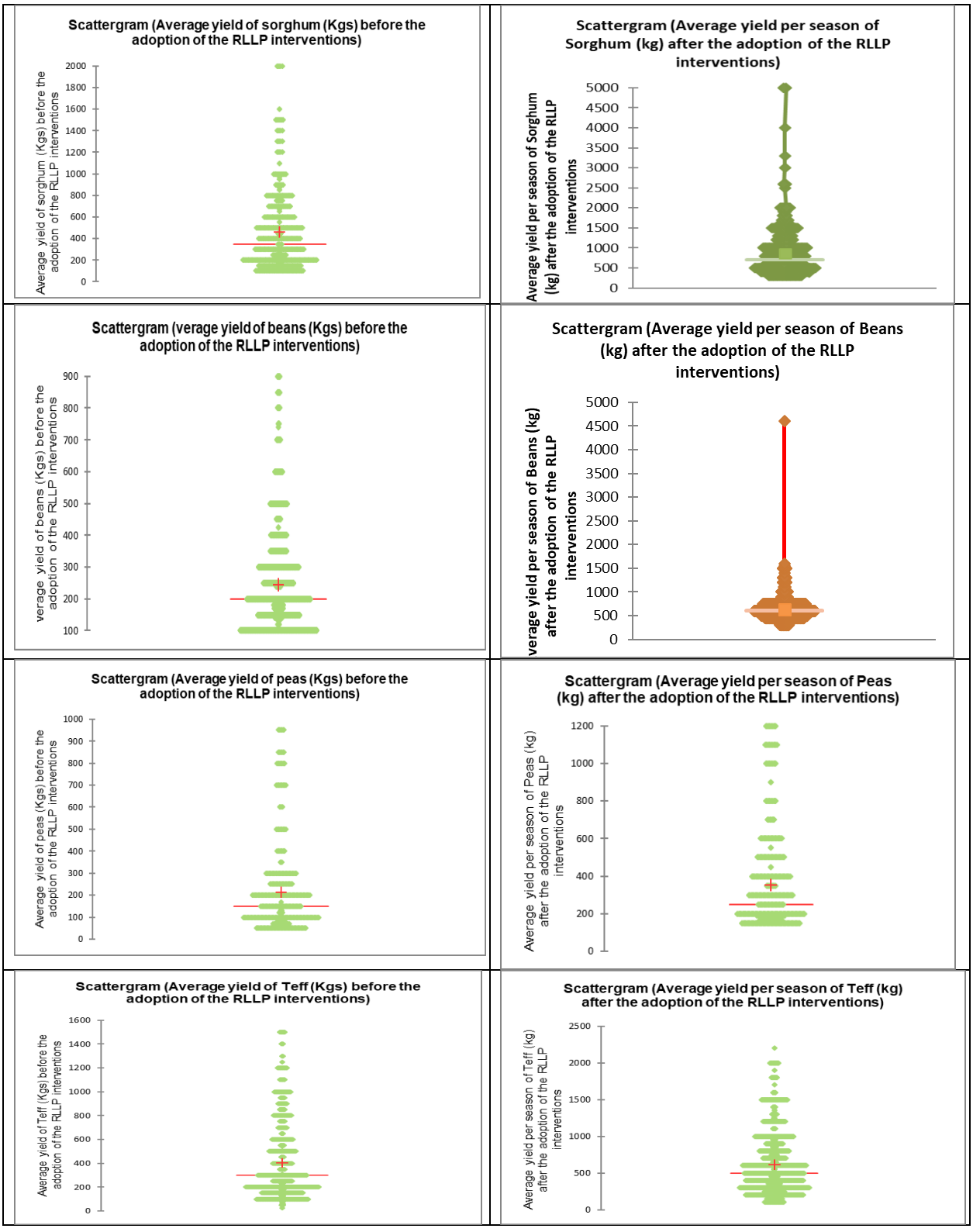
10.2.13 Literacy level and transformative capacity

Development transformative capacity		Q111: Literacy level					
		Illiterate			Literate (can read and write)		
		Count	Row N %	Column N %	Count	Row N %	Column N %
Developed transformative capacity as a result of RLLP		627	41.6%	33.5%	880	58.4%	45.7%
	No	207	60.5%	11.1%	135	39.5%	7.0%
	Yes	1035	53.2%	55.4%	910	46.8%	47.3%

Annex 3: The impact of SLMP/RLLP on productivity

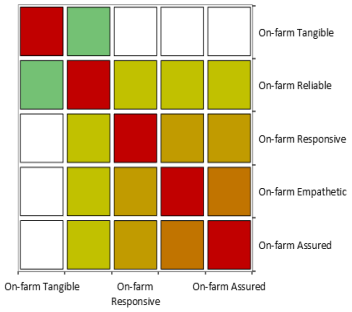
EXCEPT FOR TOMATOES, the average productivity has significantly improved after the introduction of the project that focused on reducing soil erosion and improving land quality and its productivity coupled by income generating activities to satisfy liquidity demands for households to acquire agricultural inputs.

Productivity before RLLP	Productivity after RLLP
	
	
	
	



Annex 4: Correlation maps for service quality.

Correlation maps:



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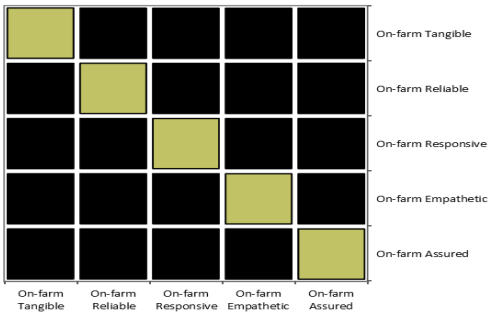

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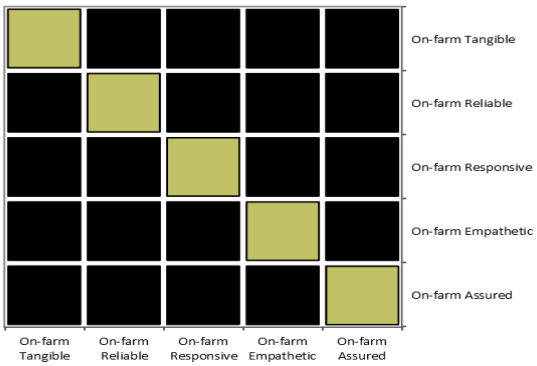
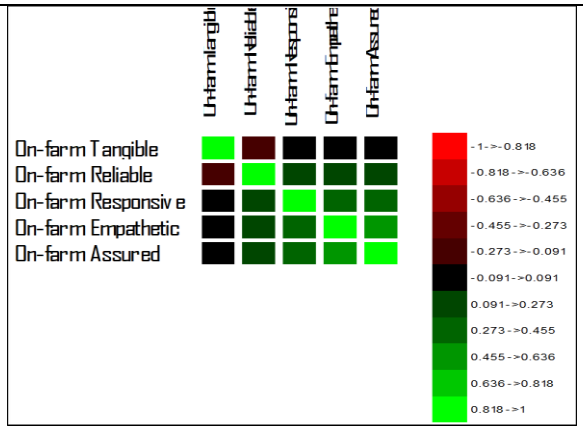
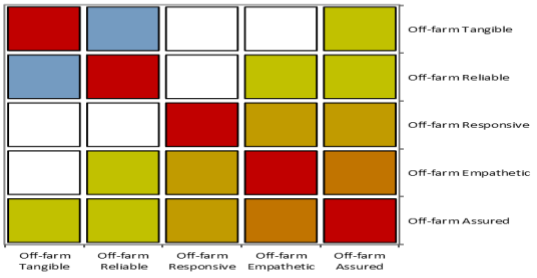




Correlation maps:



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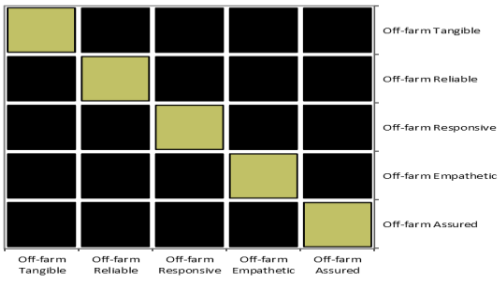

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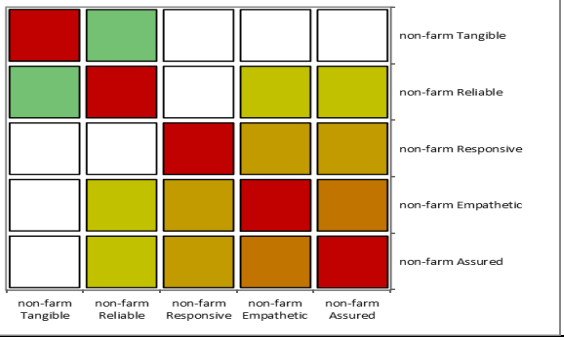

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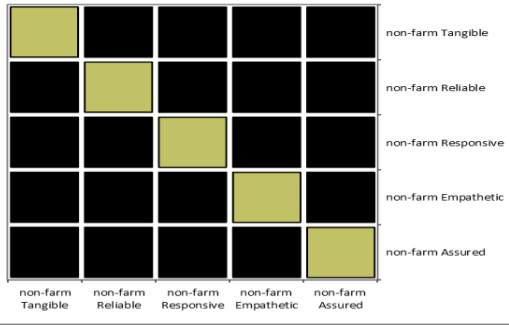


Annex 5: Others findings from FGDs and KIIs

Roles of focal persons

- To facilitate and implement all parts of SLMP project to kebele level.
- To promote the project/program activities
- Link the committees at watershed level to project. These committees include; community watershed committee, kebele level watershed committee, technical committee at woreda level, and steering committee at woreda level.
- Creates awareness about the program and provides information these about trainings and awareness among others.
- Organizes different activities like experience sharing among kebeles and between micro watersheds.
- Facilitates payments for laborers during different activities like terrace construction, seedling planting among others.

Benefits of the project

Diversification of income. There has been diversification in sources of income as previously it was just crop production by the communities but now, various sources of income have been adopted for example poultry keeping, apiculture, making of organic mature, animal rearing and fattening, afforestation from seedlings got from the project, growing grass and selling it, growing and selling fruits and vegetables among others.

Soil conservation. The SWC technology provided by the project has helped to cover bare lands hence increased the fertility and moisture of the soil as well as reduce soil erosion.

There has been rehabilitation of once degraded land by practicing afforestation and planting grass not for grazing.

Improved youth and women participation. As a segment of the community in the various water shade areas, the youth and women are targeted by the project and are participating in different sustainable land management practices as they have been working in water and soil conservation activities such as area terracing closure, gully rehabilitation and hill side treatment. With such activities, they are able to conserve the soil from degradation.

The women and youth through CIGs are given communal land by legal document in the water shade areas. They mostly use the land to grow different plants and fruits. For example, in Burie Zuria, Gozamen and Enariji Enawuga woreda, the youth have been planting apple fruit, "*Gesho*" and grass as well. From this, they generate additional income for their livelihood. This in turn increased the production of crops in the area. This has enhanced their livelihood in the community. Common crops produced in these woredas are, Teff, wheat, beans, peas and barley. In addition, potato and onion are highly produced.

> *"Before the implementation of the project, the area was fragmented and there were many gully land segments in our kebele. But now, thanks to SLMP, we implemented soil and water conservation technology and saved our lands. We had been migrating to other placing like towns and cities in search of job. But now, we are able to produce here by rehabilitating the*

gully land, planting trees, grass and use it to our animal feeds. In general, these all activities of the projects helped us to support our family." (Youth FGD, 2021).

Increase in production of produce. Communal land given to groups is used productively by planting different types of crops like wheat, barley, teff, vegetables among others. In turn this has led to increase in the income of the farmers a well reduced unemployment level.

Trainings and information access. Farmers have benefited from trainings provided by the project in ways that they can now use improved farming methods and technology as well be aware of various crops to grow in their areas as well as have access to good farming information through the woreda information centers, focal persons, and project committees among others.

Awareness and Involvement of women and youth in the project

Respondents in Oromia and Amhara were aware of the project and its activities they were assisted with experts to help implement some of these activities. The project greatly involves women in participation and decision making however in some areas women's decisions are over powered by the men. Most women's opinions are sought on which activities to take part in such as working in seedling nurseries, poultry farming among others. In some areas like in the Dijil watershed, women are prioritized when giving out poultry as they are given the first opportunity to contribute. It is after failing to meet the terms that men are considered. Women work equally with men on sustainable land management practice activities of their choice for example terracing, mulching among others.

Women make decisions and it was found that in some areas, committees that sit to screen beneficiaries and make decisions involve women on their committees. For example, the Gozemen woreda has a committee of 11 members and 4 members are women.

In Amhara region the youth were aware of the project and many in different watersheds were involved in the project activities such as growing grass on lands which they later sell to earn income unlike in Oromia region where most youth lacked such opportunities from the project hence most being unemployed despite being aware of the project.

Satisfaction levels

Most woredas and sampled watersheds were satisfied but think there's more to be done to increase their satisfaction levels to extremely satisfied as shown in recommendations below.

Challenges

- Most of the youth are landlessness though interested to work in groups, capable and committed to work with the available resources.
- In some woredas the roads between the watershed and market and to woreda information centers are bad especially during rainy season hence hindering transportation of produce.
- Most farmers are illiterate and require to have practical lessons on farming activities and technologies.
- Some woredas and watersheds are large with many micro watersheds hence focal persons having a lot of work in the area of supervision, implementation and training of farmers. Some focal persons also play double roles at woreda offices and focal person on project which gets overwhelming.

Annex 6: Assumptions of Kruskal-Wallis H Test

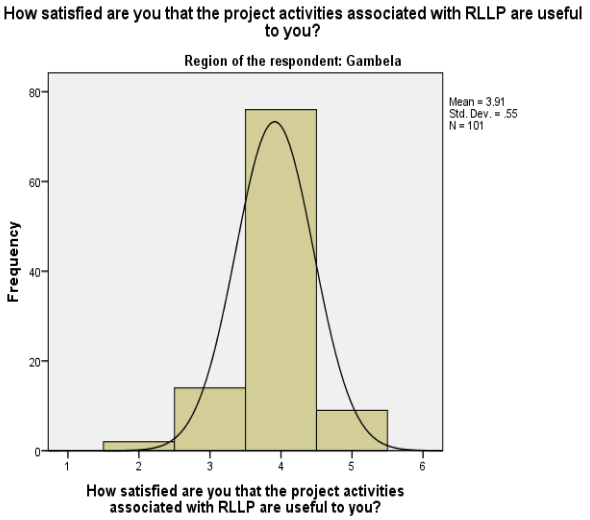
Statistics			
How satisfied are you that the project activities associated with RLLP are useful to you?			
Gambela	N	Valid	101
		Missing	0
	Mean		3.91
	Median		4.00
	Skewness		-.790
	Std. Error of Skewness		.240
	Kurtosis		2.610
	Std. Error of Kurtosis		.476
Benishangul Gumuz	N	Valid	282
		Missing	0
	Mean		3.43
	Median		4.00
	Skewness		-1.216
	Std. Error of Skewness		.145
	Kurtosis		.700
	Std. Error of Kurtosis		.289
Amhara	N	Valid	1067
		Missing	0
	Mean		4.08
	Median		4.00
	Skewness		-1.556
	Std. Error of Skewness		.075
	Kurtosis		2.674
	Std. Error of Kurtosis		.150
Oromia	N	Valid	1052
		Missing	0
	Mean		4.21
	Median		4.00
	Skewness		-.866
	Std. Error of Skewness		.075
	Kurtosis		3.190
	Std. Error of Kurtosis		.151
Sidama	N	Valid	272
		Missing	0
	Mean		4.28

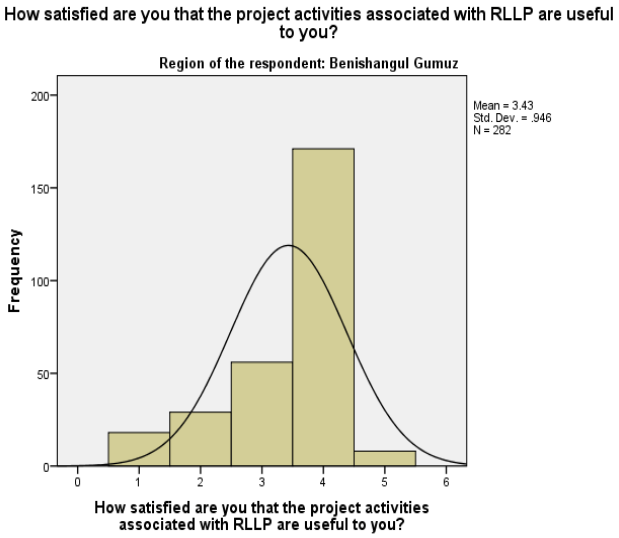
	Median		4.00
	Skewness		-1.544
	Std. Error of Skewness		.148
	Kurtosis		4.764
	Std. Error of Kurtosis		.294
SNNPR	N	Valid	1020
		Missing	0
	Mean		4.36
	Median		4.00
	Skewness		-.859
	Std. Error of Skewness		.077
	Kurtosis		2.101
	Std. Error of Kurtosis		.153

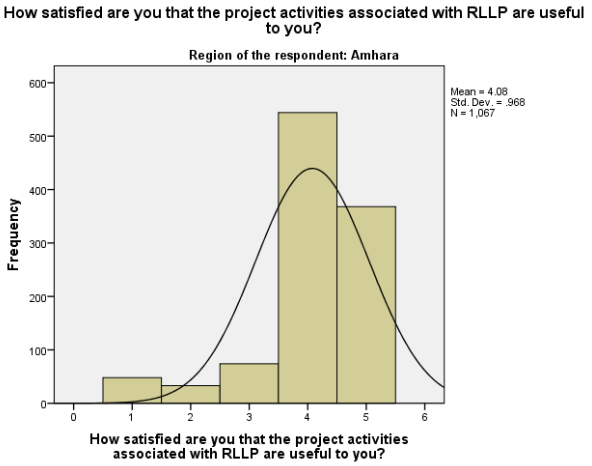
How satisfied are you that the project activities associated with RLLP are useful to you?

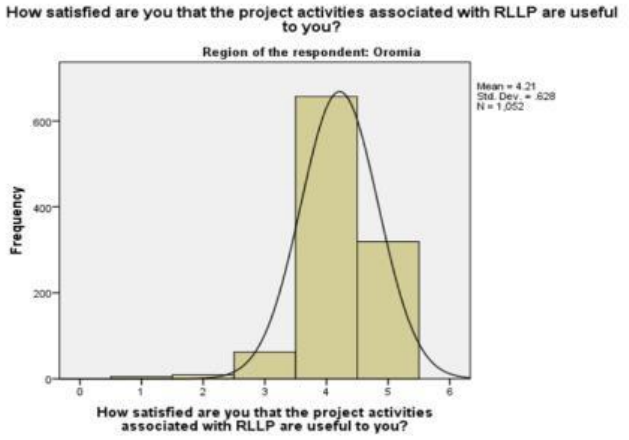
Region of the respondent			Frequency	Percent	Valid Percent	Cumulative Percent
Gambela	Valid	Dissatified	2	2.0	2.0	2.0
		Neither satisfied nor dissatisfied	14	13.9	13.9	15.8
		Satisfied	76	75.2	75.2	91.1
		Extremely satisfied	9	8.9	8.9	100.0
		Total	101	100.0	100.0	
Benishangul Gumuz	Valid	Extremely dissatified	18	6.4	6.4	6.4
		Dissatified	29	10.3	10.3	16.7
		Neither satisfied nor dissatisfied	56	19.9	19.9	36.5
		Satisfied	171	60.6	60.6	97.2
		Extremely satisfied	8	2.8	2.8	100.0
		Total	282	100.0	100.0	
Amhara	Valid	Extremely dissatified	48	4.5	4.5	4.5
		Dissatified	33	3.1	3.1	7.6
		Neither satisfied nor dissatisfied	74	6.9	6.9	14.5
		Satisfied	544	51.0	51.0	65.5
		Extremely satisfied	368	34.5	34.5	100.0
		Total	1067	100.0	100.0	
Oromia	Valid	Extremely dissatified	5	.5	.5	.5
		Dissatified	9	.9	.9	1.3

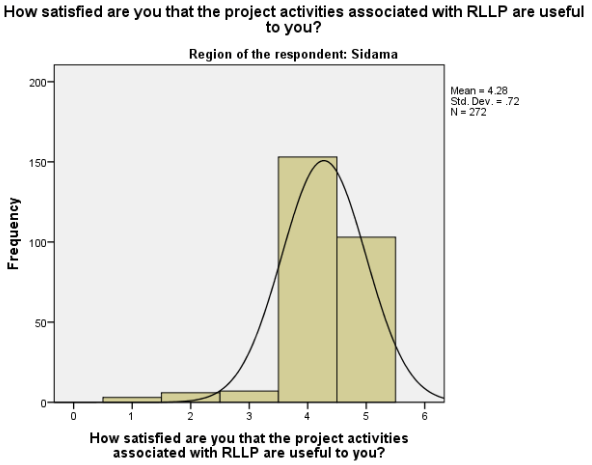
		Neither satisfied nor dissatisfied	62	5.9	5.9	7.2
		Satisfied	657	62.5	62.5	69.7
		Extremely satisfied	319	30.3	30.3	100.0
		Total	1052	100.0	100.0	
Sidama	Valid	Extremely dissatisfied	3	1.1	1.1	1.1
		Dissatisfied	6	2.2	2.2	3.3
		Neither satisfied nor dissatisfied	7	2.6	2.6	5.9
		Satisfied	153	56.3	56.3	62.1
		Extremely satisfied	103	37.9	37.9	100.0
		Total	272	100.0	100.0	
SNNPR	Valid	Extremely dissatisfied	1	.1	.1	.1
		Dissatisfied	14	1.4	1.4	1.5
		Neither satisfied nor dissatisfied	26	2.5	2.5	4.0
		Satisfied	556	54.5	54.5	58.5
		Extremely satisfied	423	41.5	41.5	100.0
		Total	1020	100.0	100.0	

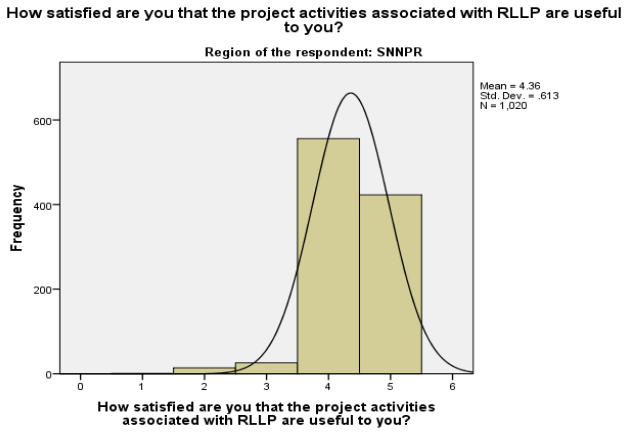












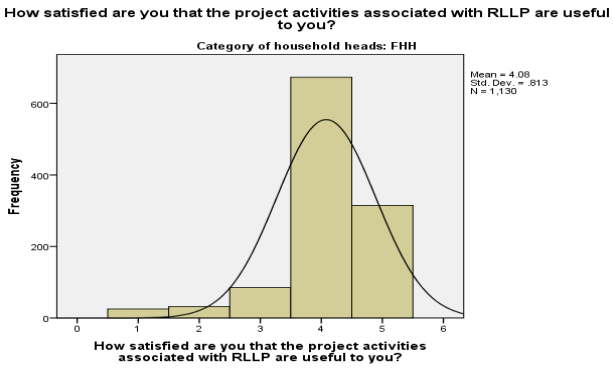
Annex 7: Assumptions of Mann-Whitney U test

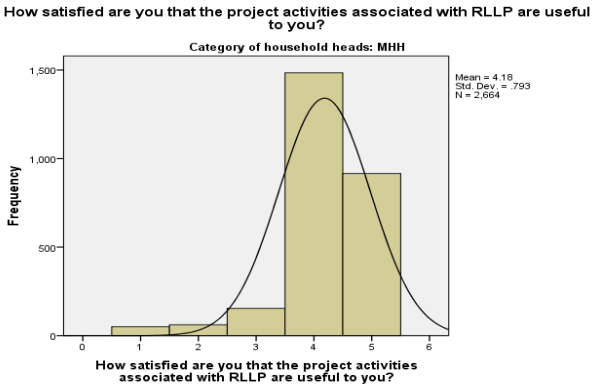
Statistics			
How satisfied are you that the project activities associated with RLLP are useful to you?			
Female headed household	N	Valid	1130
		Missing	0
	Mean		4.08
	Median		4.00
	Skewness		-1.458
	Std. Error of Skewness		.073
	Kurtosis		3.508
	Std. Error of Kurtosis		.145
Male headed household	N	Valid	2664
		Missing	0
	Mean		4.18
	Median		4.00

	Skewness	-1.520
	Std. Error of Skewness	.047
	Kurtosis	3.892
	Std. Error of Kurtosis	.095

How satisfied are you that the project activities associated with RLLP are useful to you?

Category of household heads			Frequency	Percent	Valid Percent	Cumulative Percent
Female headed household	Valid	Extremely dissatified	25	2.2	2.2	2.2
		Dissatified	32	2.8	2.8	5.0
		Neither satisfied nor dissatisfied	85	7.5	7.5	12.6
		Satisfied	673	59.6	59.6	72.1
		Extremely satisfied	315	27.9	27.9	100.0
		Total	1130	100.0	100.0	
Male headed household	Valid	Extremely dissatified	50	1.9	1.9	1.9
		Dissatified	61	2.3	2.3	4.2
		Neither satisfied nor dissatisfied	154	5.8	5.8	9.9
		Satisfied	1484	55.7	55.7	65.7
		Extremely satisfied	915	34.3	34.3	100.0
		Total	2664	100.0	100.0	





Annex8: Case study (Addisalem Micro Water Shed, Dangila)

Addisalem micro watershed, located at Dangila woreda, is one of many micro watersheds found in Amhara region. The area has Weyena Dega agro-ecology with an elevation that ranges 1947 to 2265 meters, temperatures ranging 10 to 20 degrees Celsius and rainfall ranging 1500 to 2000 millimeters. The population size is 598, with 318 men and 280 women. Afforestation has been conducted in a watershed covering more than 50 hectares. Many of the farmers in this watershed area were living in dire economic conditions characterized by poor working and living conditions before the intervention of SLM project. Climate variability and change was a threat for the rural community. The farmers formally organized and closed the dry, depleted and eroded communal land and took care of it based on the conducive working environment created by the project. The watershed region was rehabilitated and covered with a variety of indigenous plants and grasses that were previously extinct from the face of the area. As a result, soil fertility improved significantly, spring waters appeared, and the water shed area became rich in water content. Farmers were able to feed their livestock, resulting in increased milk and meat production. Farmers were also active in beekeeping, which provided them with a considerable source of revenue. The watershed area's climate comfort has increased.

Addisalem micro watershed

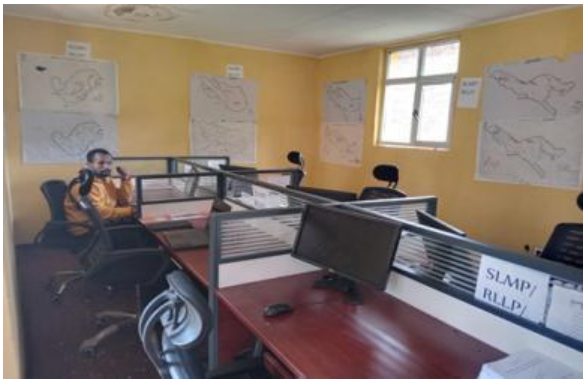
Before treatment

After treatment

Annex 9: Narrations from the WICs users

My name is Merawi, I'm a resident of Degossa. I'm an academic researcher, am researching about "Determinants of crop productivity in SNNPR-A case of Degossa"

I always use this WIC to use internet and do literature review about my topic of study. And am pleased that this facility is available ready to help academic researchers to use the resources and obtain the required information



These Centers are not only used by Academia, but also the local government officials and RLLP project staff in the process of implementing the project related activities

During the survey, we were able to meet a couple of respondents who are staffs of the agricultural office and other sectors like woreda level finance office who were enjoying from the services from the information center.

The Assosa WIC was built as part of the SLMP-II of the RLLP implementation phase. The Centre was built based on the minimum requirements set and is one of the fully functioning WICs in the Benishangul region. Its building is well designed and the compound is attractive. Inside the compound, there is a Woreda Health Center which makes the internet facilities more vital for the medic staffs that are expected to update their knowledge and decision making too.

In the process of our assessment, we landed on two people one a kebele level development agent and the other was a master's student at Haramaya University and was there for internet services. Both regularly visited the center for various services and leave the center with highest level of satisfaction possible. They chose the center because it is near to them and stable electric power than other internet cafes in the town. In addition, they also enjoyed the center's other related services like photo copy, printing, among others.

In a nut shell, the Assosa WIC is providing an ultimate information service it is supposed to furnish to agricultural and non-agricultural staffs. The number of visitors per day is 50 plus in typical periods and with this enormous number sometimes gets lower than 20 per day.

Despite the great benefits reported by the users on the WICs, there are concerns about the limit of the internet especially as the numbers of visitors are increasing day after day. Therefore, the WICs users recommend that this issue be looked into for better functionality of the WICs and effective service delivery.

Annex 10: Result Framework Indicators Summary (April 18, 2019 – October 30, 2020)

No	Result Framework indicators	Unit	Baseline value	Project end target	Project Net end target	MTR Target	Cumulative up to July 07, 2021	% from MTR	% from Net End Target
A	**PDO Indicators by Objectives / Outcomes**								
PDO 1	Land area under sustainable landscape management practices (Ha)	Ha	406,000	1,568,000	1,162,000	645,716	158,813.10	24.6	13.7
1a	Land area restored or reforested/afforested	Ha	113,000	156,000	43,000	21,500	57,875.50	269	134.6
1b	Land area with productivity enhancing practices applied	Ha	6,000	113,600	107,600	43,590	28,873.0	66.2	26.8
PDO 2	Project area showing an increase in NDVI correcting for climate effects	Percent	-	50	50	20	61.53	308	123.
PDO 3	Project area showing an increase in LSWI correcting for climate effects	Percent	-	50	50	20	57.9	289.5	115.8
PDO 4	Net greenhouse gas emissions	Tones/year	-	-965,000	-965,000	-339,561	-542,589	160	56.2
PDO 5	Households adopting diversified livelihood activities supported by the project	No	-	211,300	211,300	80,802	173,326	214.5	82
5a	Female-headed households participating in diversified livelihood activities supported by the project	No	-	37,000	37,000	14,144	29526	209	80
B	**Intermediate Results Indicators by Components**								
IR1	Share of target beneficiaries with rating 'Satisfied' or above on project interventions (aspects: livelihoods, environmental benefits, others)	%	-	65	65	50	89.3	179	137.4
1a	Share of target women beneficiaries with rating 'Satisfied' or above on project interventions	%	-	65	65	50	91.7	183.4	141.1
IR2	Targeted major watersheds with Multi-Year Plan Development Plan 100% implemented	No	-	125	125	26	-	-	-
2a	Targeted major watersheds with Multi-Year Development Plan approved	No	90	125	35	-	35	-	100
IR3	Area enclosure as a result of the project	Ha	-	43,500	43,500	16,105	27,634	171.6	64
IR4	Land users adopting sustainable land management practices as a result of the project	No	-	506,000	506,000	193,501	431,023	222.7	85.2
4a	Women land users adopting sustainable land management practices as a result of the project	No	-	276,000	276,000	105,410	212,613	201.7	77.0

No	Result Framework indicators	Unit	Baseline value	Project end target	Project Net end target	MTR Target	Cumulative up to July 07, 2021	% from MTR	% from Net End Target
4b	Female headed households adopting sustainable land management practices as a result of the project	No	-	47,300	47,300	18,088	37,493	207.3	79.3
IR5	Functional Common-Interest Groups (CIGs) established or supported.	No	-	2,628	2,628	947	1,039	110	40
IR6	People participating in income-generating activities supported by the project	No	-	382,800	382,800	145,939	165,487	113.4	43.2
6a	Women participating in income generating activities supported by the project	No	-	210,800	210,800	80,368	66,306	83.0	32
IR7	Community Watersheds Users' Cooperatives Societies (CWUCSs) established and strengthened (Micro watersheds)	No	-	2,203	2,203	1,073	980	91.3	44.5
7a	Community Watershed Management and Use Plans (CWMUPs) (Micro watersheds)	No	-	1,718	1,718	837	194	23.2	11.3
IR8	Woreda information centers being effectively used by project stakeholders	No	-	125	125	64	81	126.6	64.8
IR9	Parcels of land surveyed and mapped for certification	No	1,776,000	5,055,000	3,279,000	1,434,655	1,312,365	91.5	40.0
IR10	Second level land certificates issued as a result of the project	No	-	2,779,000	2,779,000	1,111,600	1,057,622	95.1	38.1
IR11	Households who have received second level land holding certificates	No	438,000	1,098,500	660,500	283,206	358,087	126.4	54.2
11a	Women who have received second level land holding certificates individually or jointly with a man	No	300,000	795,375	495,375	210,802	237,254	112.5	47.9
IR12	Landless youth who are members of groups who have been issued a second level certificate or other legal documentation to use communal land holdings in exchange for restoring land	No	14,000	34,000	20,000	7,842	9,227	117.7	46.1
12a	Women Landless youth who are members of groups who have been issued a second level certificate or other legal documentation to use communal land holdings in exchange for restoring land	No	4,200	10,200	6,000	6,512	7,702	118.3	128.4
IR13	Woredas with functioning land administration information systems	No	-	129	129	49	35	71.4	27.1