

Project: Reducing land degradation and farmers' vulnerability to climate change in the highland dry areas of north-western Ethiopia
Detailed work plan for 2014

Output 1: Appropriate bio-economic system model at the watershed level verified and used to describe and analyze the system dynamics, productivity and the constraints to improved performance.

Activity	Sub-Activity	Methods	Team	Outputs	Delivery date	Training	Budget (USD)
Activity 1.1: Data collection, calibration and verification of the model.	1.1.1. Maintenance of the weirs and the equipment	Design & modify gauging stations; Installation and calibration of all sensors	Nigus Andreas, Stefan Feras, Atikilt, Melkamu, Sisay, Wondimu	Functioning monitoring system	May '14	Technical training on the design of the weir, sensors, & data quality & interpretation for 2 persons & on the job training for others	8000 Training in Austria: 2000,- (Flight 1100,- Accommodation etc. 900,-)
	1.1.2. Collection and lab analysis of watershed monitoring data (precipitation, runoff, sediment)	Field and lab data collected and analyzed during rainy season but also during dry season (2x per month)	Nigus, Melkamu, Atikilt, Ahmed, Meron, Tamirat, Feras, Andreas, Lubna, Mira, Wondimu	Data (Excel, Word)	End of Dec. '14	On the job training on data quality and interpretation	11250 (costs for sample analyses for 3 Austrian students appr. 200 excl. travel to watershed)
	1.1.3. Calibration and validation of SWAT including the sub watersheds	Data from 2011 for calibration and from 2012 and ongoing for validation	Hailu, Nigus, Menelik, Atikilt, Yeshiwondem, Feras, Debra, Lubna, Andreas, Sрни	Calibrated and validated model; Report	April '14 (whole watershed), August '14 (sub watersheds)	SWAT training by Sрни; students involvement; need to suggest topics for students	10000 (excluding Sрни's payment)
Activity 1.2: Model application for rainfed system analysis.	1.2.1. Definition of land use and climate change scenarios	Land suitability analysis; Multidisciplinary workshop to identify different scenarios; downscaling of GCM's to the local level	Feras, Debra, Mira, Yigezu, Menelik, Atikilt, Abate, Meron, Sisay, Sрни, Wondimu	Land suitability and scenarios identified	June '14 (land suitability) Sept. '14 (scenarios)	Training workshop in land suitability;	15000

Activity	Sub-Activity	Methods	Team	Outputs	Delivery date	Training	Budget (USD)
	1.2.2. Simulation of land use and climate change scenarios	Run the model for different scenarios	Hailu , Nigus, Feras, Debra, Andreas, Yigezu, PhD student	Report detailing the results of the different scenarios	Oct. '14 (land use)	MSc student topic CC modeling	7500
	1.2.3. Establish baseline for socio-economic evaluation and impact assessment	Social, economic market data collection, biophysical measurements (??)	Yigezu , Yonas, Mesfin, Eshetu, Beza, Debra, Tilaye, Wondimu	Clean data in SPSS made available; Baseline value for impact indicators established	Oct. '14	--	6500
	1.2.4. Building the bio-economic model		Yigezu , Yonas, Mesfin, Eshetu, Feras, Andreas, Debra, Tilaye, Wondimu	Bio-economic model that shows optimal resource allocation under different scenarios built	Dec. '15	PhD student	200000 ?

Output 2: Farmers' perception on climate change, their vulnerability to the adverse effects of climate change, and their adaptation strategies identified, documented and availed to policy makers and development practitioners.

Activity	Sub-Activity	Methods	Team	Outputs	Delivery date	Training	Budget (USD)
Activity 2.1: Assessing farmers' perceptions on climate change and analyze the biophysical and socio-economic factors determining exposure and adaptive capacity and adaptation to climate change.	2.1.1. Assessing farmers' perception and adaptation strategies	Living memory and perception survey; Analysis	Yigezu, Yonas, Mesfin, Shinan, Beza, Wondimu	Reports and policy briefs;	Survey (June '14), Report (Dec. '14),	-	4,750
	2.1.2. Farmer training on climate change and optimal adaptation strategies	Training with a multi-disciplinary context (in class?)	Yonas, Yigezu, Mesfin, Beza, Debra, Wondimu	Raise awareness based on outcomes of survey	Feb. 15	50 farmers	8000
	2.1.3. Training for researchers on concepts and implications of CC on agriculture	In class training (starting from general and zooming to local)	Yonas, Yigezu, Mesfin, Beza, Debra, Wondimu	Awareness raised	Feb. 15	30 researchers	15,000

Output 3: Integrated farm level SLM technologies (technologies that enhance the organic matter content of the soil, reduce erosion, enhance soil water holding capacity, restore land productivity) that build resilience to and mitigate climate change impacts are compatible and and that are affordable to resource-poor farmers developed, tested, demonstrated and applied by the rainfed community in the target area.

Activity	Sub-Activity	Methods	Team	Outputs	Training	Delivery date	Budget (USD)
Activity 3.1: Implementing conservation tillage technology that improves the physical, chemical, biological, and hydrological properties of the soil	3.1.1. Assessing and testing conservation tillage technologies to improve productivity and soil characteristics	Desktop study to review and assess the extent and methods of conservation tillage in the highlands. Field trials will be started in 2015	Sisay, Nigus, Tsedalu, Yeshiwondim, Atikilt, Yonas, Debra, Andreas, Yigezu, Wondimu	Report on conservation tillage in the Ethiopian highlands. Long-term plots established	Training for farmers	December 2015	Funded by CRP 1.1 8700
	3.1.2. Determining the effect of timing of ridging and tie-ridging on the performance of sorghum at North Gondar, Ethiopia	Field trial: 8 treatments, RCBD, 3 reps, 2 years. Analysis of the historic dry spell data	Sisay, Meron, Nigus, Debra, Wondimu	Optimum time of ridging & tie-ridging and effect on soil moisture determined; Report	Demonstration to researchers and farmers groups (watershed committee and FREG)	Progress reports Dec 2014/15, Final report June 2016	3500
Activity 3.2: Implementing soil organic matter enhancing technologies, such as green manure, compost, animal manure, crop residue, crop rotations, crop diversification and	3.2.1. Investigating effect of cover-crop and GM on run-off, soil characteristics and yield of chickpea	Field trial monitoring run off and sediments in 4 treatments, RCBD, 3 reps, 3 years, permanent plot	Nigus, Sisay, Meron, Atikilt, Debra, Feras, Andreas, Wondimu	Data collected on run-off and soil characteristics for model calibration (Sub-activity 1.1.3) and application (Sub-activity 1.2.2)	Demonstration to researchers and farmers groups (watershed committee and FREG)	Progress reports Dec 2014, Final report June 2015	10250

Activity	Sub-Activity	Methods	Team	Outputs	Training	Delivery date	Budget (USD)
intercropping, and integrated plant nutrient management technologies	3.2.2. Investigating the effect of N, P & K fertilizer application for teff productivity	Field trial of N & P applications: 2 soil types, 16 treatments, RCBD, 3 reps, 2 years Desktop study to assess the availability and impact of K fertilizer in the highlands	Meron , Nigus, Sisay, Debra, Wondimu	Optimal N & P fertilizer rates and timing for teff production in the highlands determined; data for sub-activity 3.2.10. Report on K fertilizer use and effectiveness in the highlands	Demonstration to researchers and farmers groups (watershed committee and FREG)	Progress reports Dec 2014, Final report June 2015	3250 + funding from CRP 1.1 for K study
	3.2.3. Investigating the effect of split application of N fertilizer on sorghum productivity (ongoing)	Field trial: 10 treatments, RCBD, 3 reps, 2 years	Nigus , Meron, Sisay, Debra, Yigezu, Wondimu	Optimum N split application time and rate for sorghum production in the highlands determined; data for sub-activity 3.2.10	Demonstration to researchers and farmers groups (watershed committee and FREG)	Progress reports Dec 2014, Final report June 2015	3250
	3.2.4. Determination of rate and time of N application on wheat yield productivity (ongoing)	Field trial: 16 treatments, RCBD, 3 reps, 2 years	Nigus , Meron, Sisay, Debra, Wondimu	Optimum N split application time and rate identified; data for sub-activity 3.2.10	Demonstration to researchers and farmers groups (watershed committee and FREG)	Progress reports Dec 2014, Final report June 2015	3250
	3.2.5. On farm evaluation of alley cropping for soil fertility and crop productivity improvement	Field trial: 4 treatments (Gliricidia, Sesbania, Tephrosia) RCBD, 3 reps, 3 year, sorghum, soil & plant analysis	Abate , Abrham, Destaw	Optimum spacing and species type for improved sorghum yields identified	Demonstration to researchers	Progress reports Dec 2014/15, Final report June 2016	5048

Activity	Sub-Activity	Methods	Team	Outputs	Training	Delivery date	Budget (USD)
	3.2.6. Determining the optimum planting size of <i>Ficus thonningii</i> Blume to enhance its plantation and to solve dry-season fodder shortage in Gummara-Maksegnit watershed	Field trial: 6 treatments, RCBD, 3 reps, 3 years Soil data	Abate , Abrham, Destaw	Optimum cutting size for planting and successful establishment identified	Demonstration to researchers	Progress reports Dec 2014/15, Final report June 2016	2363
	3.2.7. Evaluating the adaptability of <i>Olea europaea</i> provenances to mitigate climate change in the dry highland of Gummara-Maksegnit watershed	Field trial: 8 treatments, RCBD, 3 years	Abate , Abrham, Destaw	Adaptive olive tree species identified and evaluated	Demonstration to researchers	Progress reports Dec 2014/15, Final report June 2016	4022
	3.2.8. Introduction of fuel saving technologies to reduce land degradation & CC, improve soil fertility, and livelihoods	Select and train fuel-saving stove producers; Train stove users; Experience sharing; Collecting feedbacks	Mesfin , Debra, Beza, Feras, Abrham, Abate, BD Ag Mech.	10 women trained to produce stoves; at least 200 stoves produced and distributed in the watershed	Training for stove producers; Training and experience sharing for stove users	Stove producers trained Apr 2014; Stove users; May 2014 – Nov 2014; Report Dec 2014	Funding through CRP 7: (24,000)
	3.2.9. Review and scoping study of compost production potential in the watershed	Desk top and fact-finding exercise to generate information on availability of material and methods to produce compost in the watershed	Nigus , Debra	Report on potential for producing compost in the watershed; data for crop and watershed modeling of compost use	MSc student	Report Dec 2014	Funded through CRP 1.1

Activity	Sub-Activity	Methods	Team	Outputs	Training	Delivery date	Budget (USD)
	3.2.10. Assessing crop production potential and best management practices in the watershed using models	Use of biophysical models to simulate crop production, soil-water-crop interactions and management strategies	Nigus, Debra, Feras	10 researchers trained in theory of modeling soil-water-crop interactions and trained in use of one specific model - CropSyst	10 researchers trained in biophysical crop modeling May 2014	Report Dec 2014	12,000
Activity 3.3: Dissemination and extension of soil and water conservation (SWC) interventions	3.3.1. Assessing farmers' perception and willingness to pay for SWC	Survey to compare farmers who use technologies with those that are not; Review of literature on farmers' perceptions and adoption of SWC technologies	Yonas, Mesfin, Yigezu, Feras, Atikilt, Wondimu	Reports and policy briefs		Survey Jun 2014, Report Dec 2014	6,000
	3.3.2. Testing different strategies to mobilize farmers to maintain SWC structures	Use survey to identify strategies to motivate farmers	Abrham, Atikilt, Feras, Mesfin, Wondimu Ag. Office	Maintained SWC structures; report on recommendation strategies	Farmers experience sharing visit at another model watershed	Apr 2014 with gov. assistance, Apr 2015 post-survey	4,000
	3.3.3. Dissemination and extension of knowledge and technologies to the community through FREGs	Strengthen and train existing FREG and establish watershed committee. Asses 4 + 1 model (1 farmer with 4 followers) as extension tool	Mesfin, Yonas, Bidiglign, Eshetu, Nigus, Tsedalu, Tikunesh	Functional FREG and watershed committees equipped and enabled to increase awareness and facilitate technology adoption. Assessment of efficacy of 4+1 extension model	Committee and FREG Experience sharing PhD or masters student	Apr 2014 Report Dec 2014	4,000

Output 4: Farmers' adaptation capacity to drought increased as a result of developing, testing, fine-tuning and applying water harvesting and supplemental irrigation/off-season vegetable production system that are suitable and affordable to poor farmers.

Activity	Sub-Activity	Methods	Team	Outputs	Training	Delivery date	Budget (USD)
Activity 4.1: Implementation of water harvesting/supplemental irrigation systems and water harvesting/off-season vegetable production systems together with agronomic practices at the farm and community levels.	4.1.1. Deficit irrigation on growth and yield of onion and garlic	RCBD, 3 reps, 4m X 4m plot, 2 meter spacing between blocks, 1.5 m spacing between plots, irrigation system is furrow using siphon tubes and farmers practice for control treatment	Ertiban, Ahmed, Sisay, Nigus, Yohannes, Wondimu Fawzi	-1 year data collected & analyzed -Preliminary result reported for onion and garlic	On deficit irrigation management	Dec. '14 – Feb. '15	18,920
	4.1.2. Modeling of water harvesting techniques (community ponds)	Scenario studies, testing models for water balance estimation and water use.	PhD/MSc. students from GARC Boufaroua, Ertiban, Ahmed, Menelik, Feras Wondimu	- PhD students engaged - Input data collected for models		Dec. '14- Feb. '15	To be discussed with the students 5,000
	4.1.3. Trainings on WH techniques, models, software, field & lab equipment use	Lecture & practical trainings on models, water harvesting techniques, and software (GIS, SWAT, etc)	Ertiban Nigus Boufaroua Wondimu	Researchers and technical assistant trained	7 researchers and 4 technical assistance	Dec 2014	5,000
	4.1.4. Capacity building for farmers & development agents (DAs) on runoff harvesting ponds and water management	Lectures/ Trainings	Ertiban Nigus Sisay Wondimu	30 farmers & 10 DAs trained	30 farmers & 10 DAs	Dec. 2014	3,000
	4.1.5. Traveling workshop	Visit some WH structures in arid areas such as terraces, cisterns, small farm dams etc. For researchers and specialists from development	Ertiban Nigus Boufaroua Wondimu	technology shopped, experience shared	10 researchers	Dec. 2014	10,000

Activity	Sub-Activity	Methods	Team	Outputs	Training	Delivery date	Budget (USD)
Activity 4.2: Assessing farmers' attitude towards developing water harvesting ponds for supplemental irrigation and off-season vegetable production and factors (bio-physical and socio-economic) for adopting or not adopting the system.	This activity has been done by an intern.						

Output 5: Crop and livestock types/varieties/breeds and management practices that better adapt to climate change impacts (rainfall variability, rising temperatures and evaporation rates, and drought) and reducing farmers' vulnerability developed, tested and demonstrated with the participation of local communities (Crop).

Activity	Sub-Activity	Methods	Team	Outputs	Training	Delivered by (Date)	Budget (USD)
Activity 5.1: Implementing participatory evaluation, demonstration, and dissemination of drought and high temperature tolerant crop varieties and management practices and livestock management technologies that can improve farmers' resilience to climate change.	5.1.1.1. Adaptation of hot pepper varieties in Gumara-Maksegnit watershed under irrigation	10 hot pepper vars., RCBD, 3 reps, FREG evaluation Field day will be conducted	Zeynu , Birhanu, Melkie, Mesfin, Wondimu, World Vision GZ ADP	At least one var. identified	50 farmers, 5 SMS	Dec. '14- May '15	2431
	5.1.1.2. Determination of weeding frequency to increase production and productivity of Sorghum in Gumara -Maksegnit Watershed	7 treatments, RCBD, 3 reps, FREG evaluation Field day will be conducted	Yimer , Yohanes, Tsedalu, Mesfin, Wondimu	Best weeding frequency will be identified/preliminary result/	60 farmers & 6 SMS	Dec. 2014	4000
	5.1.1.3. Experience sharing tour for farmers & development workers on sorghum production	Field visit and discussion with farmers & researchers	Mele , Tsedalu, Mesfine, Yimer, Yohanes	Farmers & SMS will gain experience on packages of sorghum production technologies	20 farmers & 3 experts	Dec. 2014	4500
	5.1.1.4. Pre-scaling up of early maturing & drought escaping improved chickpea vars. & agronomic packages through farmers' based seed production and local seed systems at the Gumara-Makisegnit Watershed.	10 ha in cluster 40 farmers will participate Shasho and Ararti vars. used Sensational workshop Training for 40 farmer and experts 2-3 field days	Mesfin , Yonas, Eshetu, Getachewu, Birkie, Wondimu, World Vision GZ ADP LI-SRMP	20 tone seed produced establishment of the best seed system/formal and or informal	40 farmers	Dec 2014	9228
	5.1.1.5. Effect of soil drainage and fertilizer on the productivity of sorghum on vertisols	6 treatments, RCBD, 3 rep Field day will be conducted	Tsedalu , Birkie, Yimer, Agegnehush, Wondimu	Final Report, one Scientific paper, one Mgmt technology		Dec. 2014	2907

Activity	Sub-Activity	Methods	Team	Outputs	Training	Delivered by (Date)	Budget (USD)
	5.1.1.6. Evaluation of sorghum/faba bean intercropping for intensifying existing production systems in the Gumara-Maksegnit watershed that better adapt climate change	6 treatments, RCBD, 3 rep, Field day will be conducted	Tsedalu , Birkie, Yimer, Agegnehus, Wondimu	Final report, one scientific paper, one sorghum/faba bean intercropping technology		Dec. 2014	3119
	5.1.1.7. Response of Tef row planting to sowing dates on the highland heavy clay soils of North Gondar Zone	10 treatments, RCBD, 3 rep Field day will be conducted	Tsedalu , Birkie, Yimer, Agegnehus	Final report, one scientific paper, new technology identified		Dec. 2014	3044
	5.1.1.8. Participatory evaluation and selection of improved lentil varieties in Gumara- Maksegnit watershed that better adapt climate change	11 treatments, RCBD, 3 rep, mother and baby trial, Field day will be conducted	Getachewu , Tewodros, Birkie, Yohanes, Mesfin	At least one var. identified, final report, one scientific paper	38 farmers and 2 Experts	Dec. 2014	1052
	5.1.1.9. Capacity building	proposal & scientific paper writing		13 researchers & researchers assistant trained	13 researchers & research assistant	Dec. 2014	1579
	5.1.1.10. Experience sharing tour to Sirinka ARC	Researcher, Research Assistants		15 research staff got experience	15 Researchers, research assistants participate	Dec. 2014	3000

Output 5: Crop and livestock types/varieties/breeds and management practices that better adapt to climate change impacts (rainfall variability, rising temperatures and evaporation rates, and drought) and reducing farmers' vulnerability developed, tested and demonstrated with the participation of local communities (Livestock).

Activity	Sub-Activity	Methods	Team	Outputs	Training	Delivery date	Budget (USD)
Activity 5.1: Implementing participatory evaluation, demonstration, and dissemination of drought and high temperature tolerant crop varieties and management practices and livestock management technologies that can improve farmers' resilience to climate change.	5.1.2.1. Fattening of yearling sheep using adaptive cultivated forages developed under stock excluded area	Treatments T1=Farmers practice T2=Grazing + 85% Napier grass +15% Sesbania T3= Grazing + 400 gm concentrate Design RCBD Data to be collected: initial & final body weight, 15 days body weight change, feed offered and left over; buying & selling sheep price, farmers assessment	Tikunesh, Alemu, Belete, Kifetew, Yonas, Jane, Kefyalew (WV), Mechanizat ion	<ul style="list-style-type: none"> • Forage species established, • Participant farmers & animals identified 		Dec. '14	6,000
	5.1.2.2. Sheep fattening with urea treated <i>tef</i> straw and other supplements in Gumara-Maksegnit-watershed	Treatments T1= Farmers practice T2= Grazing+Urea treated <i>tef</i> straw + 300 g concentrate T3 = Grazing+Urea treated <i>tef</i> straw + 400 g forage legume (Vetch) Design RCBD Data to be collected: Feed offered and left over; Initial and final body weight; 15 days body weight changes; farmers assessment; buying & selling price of animal; Straw, concentrate & labor cost	Tikunesh, Alemu, Belete, Kifetew, Yonas, Jane, Kefialew (WV)	<ul style="list-style-type: none"> • Vetch species established, • Urea treated <i>tef</i> straw prepared, • Participant farmers and animals identified 		Dec. '14	3,970

Activity	Sub-Activity	Methods	Team	Outputs	Training	Delivery date	Budget (USD)
	5.1.2.3. Evaluation of the adaptability of different sweet lupin varieties in Gumara- Maksegnit watershed	6 sweet lupin cvs. (Boral, Borlu, Boruta, Boregine, Sanabor & Vitabor) from three lupin species will be used. RCBD, 3 reps. One half will be used for forage sampling and the other half for seed sampling Forage sampling will be done at 50% flowering stage Data to be Collected: Days to emergence, flowering, pod setting, pod filling & maturity; No. of nodules per plant (viable and none viable nodules) Plant height at maturity No. of pods per plant No. of seeds per pod Forage and seed yield Pest and disease incidence/score	Alemu, Tikunesh, Likawent, Belete, Tadesse (soil lab.)	Adaptive varieties identified (indicative results)		Dec. '14	3,000
	5.1.2.4. Development and implementation of a pilot village-based goat improvement scheme	Selection scheme: a village selection procedure will be followed (details & experience from DBARC), villagers will be organized based on common grazing areas, selection will take place at 6 month of age, productive, reproductive, off take, entry, mortality & health data will be collected.	Solomon, Aynalem, Alayu, Teshome, Kifetew	<ul style="list-style-type: none"> • 24 bucks selected • 1 year breeding data available 		Dec. '14	10,050

Activity	Sub-Activity	Methods	Team	Outputs	Training	Delivery date	Budget (USD)
	5.1.2.5. Design of dissemination of improved genetics for climate change adaptation and optimization of community based breeding program	Identify options by consulting the community, study the pros and cons of each system, compile the available knowledge and practices of breeding systems, optimize community based breeding program in the study area, design techniques and approaches of dissemination of improved genetics in consultation with the community, test the significance of CBBP to climate change and its alternative as “fit-win” solution to a changing environment	Solomon, Aynalem, MSc. Student	<ul style="list-style-type: none"> •CBBP optimized, •Dissemination strategy identified 	MSc study	June. '15	10,000
	5.1.2.6. Development of best cost forage based feed formulation for fattening goats in Gumara-Maksegnit watershed	Treatments T ₁ =Browsing alone T ₂ =Browsing + recommended level of concentrate T ₃ =Browsing + cowpea hay T ₄ =Browsing + cowpea hay (50%) + recommended level of concentrate (50%) T ₅ =Browsing + cowpea hay (75%) + recommended level of concentrate (25%) T ₆ =Browsing + cowpea hay (25%) + recommended level of concentrate (75%) RCBD with 6 rep.	Tikunesh, Alemu, Belete, Kifetew, Yonas,	Forage based fattening package for goat identified, one scientific paper		Dec. '14	2,000

Activity	Sub-Activity	Methods	Team	Outputs	Training	Delivery date	Budget (USD)
	5.1.2.7. Evaluation of undersowing vetch in sorghum for intensifying existing production systems in the Gumara-Maksegnit watershed	Treatments: 1. Sole sorghum (S ₀) 2. Sorghum in 75 cm row spacing plus Vetch planted 4 weeks after sorghum planting 3. Sorghum in 75 cm row spacing plus Vetch planted 6 weeks after sorghum planting 4. Sorghum in 150 cm row spacing plus vetch planted 4 weeks after sorghum planting 5. Sorghum in 150 cm row spacing plus vetch planted 6 weeks after sorghum planting RCBD design, 3 reps	Alemu, Tikunesh, Belete, Tsedalu	Preliminary results on performance of the cropping system		Dec. '14	2,900
	5.1.2.8. Adaptation and performance evaluation of Prickly Pear cactus in Gumara-Maksegnit watershed.	Treatments: 6 cvs (Sulhuna, Gerao, Dilaledik, Gerwanlayele, Ameudegaado Belesa, Local). RCBD design, 3 reps, using 15 plants per plot as an experimental unit. Data to be collected: Days taken to sprout, percent plants sprouted, percent survival of cladodes 6 months after planting, number of cladodes formed per plant, length and width of cladodes, average weight of cladode, biomass yield.	Alemu, Tikunesh, Belete	Adaptive varieties identified		Dec. '14	1,950
	5.1.2.9. Market Linkage and Value Addition	Assessing willingness to pay and value addition at each node	Yonas, Mesfin, Yigezu, MSc student	Preferences different actors for different goat attributes identified; Market linkage established	30 farmers One MSc student	June. '15	10,000

Activity	Sub-Activity	Methods	Team	Outputs	Training	Delivery date	Budget (USD)
	5.1.2.10. Researchers and research assistances training	Training on R, SAS, SPSS, proposal & scientific paper writing, DREMS (Data Management & Recording System)		8 researchers & research assistants trained		2014	12,000
	5.1.2.11. Experience sharing tour for researchers, research assistants & SMS	Holeta & Adami Tullu research centers	Researcher, research assistance	8 research staffs & 6 SMS get experience on improved livestock technologies		May '14	3,847
	5.1.2.12 Farmers & SMS training	Training on animal husbandry (forage, feeding, selection, health & market)	Solomon, Tikunesh, Yonas, Alemu, Alayu, Kifetew	Raise awareness of farmers on improved animal husbandry practices	10 SMS & 100 farmers	June '14	4,450
	5.1.2.13. Laboratory & office equipment			Improved laboratory facility	-----	April '14	6,650

Output 6: Enhanced capacity of national researchers, farmers and service providers. Capacity building and institutional strengthening achieved through training of national scientists, extension staff and farmers, travelling workshops, field days, and scientific visits to international centers.

Activity	Sub-Activity	Methods	Team	Outputs	Delivered by (Date)	Budget (USD)
Activity 6.1: Participating staff from the collaborating research institutions and community and watershed association leaders will receive on-the-job training in resource assessment and management through “learning by doing” in participatory approaches.	Sub activity 6.1.1. Training on biometrics for researchers	20 researchers trained by biometricians from ICARDA & EIAR	Wondimu, Feras	20 researchers trained & project data analyzed sufficiently.	March 2014	19634
	Sub activity 6.1.2. Training on crop modeling for researchers	10 researchers trained by ICARDA scientists	Wondimu, Debra, Vinay	10 researchers trained & knowledge gained applied in the project	April 2014	10175
	Sub activity 6.1.3. Training on Land suitability analysis	10 researchers trained by ICARDA scientists	Feras, Wondimu	10 researchers trained & knowledge gained applied in the project	April 2014	5000
	Sub activity 6.1.4. Experience sharing tour to Sirinka RC for researchers and research assistances.	Planned in output 5 (crop)	Tsedalu	15 researchers got experience on research approaches and methodologies	Dec. 2014	3000
	Sub activity 6.1.5. Training on proposal & scientific paper writing, DREMS (Data Management & Recording System)	Planned in output 5 (crop & livestock)	Tsedalu, Tikunesh	21 researchers & researchers assistant trained.	Dec. 2014	7579 (adding the crop & livestock budget)
	Sub activity 6.1.6. Travelling workshop for researchers & development workers to visit WH structures (terraces, cisterns, small farm dams etc.) in arid areas	Planned in output 4	Ertiban, Nigus	Technology shopped, experience shared	Dec. 2014	10000
	Sub activity 6.1.7. Experience sharing tour for researchers, research assistants & SMS to Holeta and Adami Tullu RC.	Planned in output 5 (livestock)	Tikunesh	8 research staffs & 25 SMS got experience on different livestock research approach and methodology	May 2014	6415
	Sub activity 6.1.8. Trainings on WH techniques, models, software, field & lab equipment use	Planned in output 4	Boufaroua, Ertiban	7 researchers and 4 technical assistance trained	Dec 2014	5000

Output 6: Enhanced capacity of national researchers, farmers and service providers. Capacity building and institutional strengthening achieved through training of national scientists, extension staff and farmers, travelling workshops, field days, and scientific visits to international centers.

Activity	Sub-Activity	Methods	Team	Outputs	Delivered by (Date)	Budget (USD)
Activity 6.2: Formal short-term trainings which will include local training for the watershed association members in farm management practices, water management and crop and livestock related activities will be provided.	Sub activity 6.2.1. Strengthen Watershed committee and FRG	Training, regular meeting, experience sharing	Wondimu, Nigus, Yonas	FRG members will actively participate in the watershed research	Dec .2014	3000
	Sub activity 6.2.2. Experience sharing tour for farmers & development workers on sorghum production	Field visit and discussion with farmers & researchers	Mele , Tsedalu, Mesfine, Yimer, Yohanes	20 farmers & 3 experts Farmers & SMS will gain experience on packages of technologies for sorghum production.	Sept. 2014	5000
	Sub activity 6.2.3. Capacity building for farmers and development agents (DAs) on runoff harvesting ponds and water management	Planned in output 4 Training	Ertiban, Ahmed	30 farmers & 10 DAs trained	Dec. 2014	3,000
	Sub activity 6.2.4. 5.1.2.12 Farmers & SMS training on animal husbandry (forage, feeding, selection, health & market)	Planned in output 5 (livestock) Class room and practical training	Solomon , Tikunesh, Yonas, Alemu, Alayu, Kifetew	100 farmers & 10 SMS got awareness on improved animal husbandry practices	June '14	4,450
	Sub activity 6.2.5 Training on integrating gender in research activities	workshop and field visit to test gender analysis tools	Beza, Debra, Wondimu	Gender will be mainstreamed into all project activities	February 2014	To be funded by a separate grant
	Sub activity 6.2.6 Farmer training on climate change and optimal adaptation strategies	Planned in output 2 Training with a multi-disciplinary context (in class?). 50 farmers will be trained	Yonas, Yigezu, Mesfin, Beza, Debra, Wondimu	Raise awareness based on outcomes of survey	Feb. 15	8000
	Sub activity 6.2.7 Training for researchers on concepts and implications of CC on agriculture	Planned in output 2 In class training (starting from general and zooming to local). 30 researchers to be trained.	Yonas, Yigezu, Mesfin, Beza, Debra, Wondimu	Awareness raised	Feb. 15	15,000

Output 7: Technical and policy recommendations for best climate change adaptation strategies and SLM practices.

Activity	Sub-Activity	Methods	Team	Outputs	Delivered by (Date)	Budget (USD)
Activity 7.1 Write actionable policy recommendations based on project outputs (Phase I)	Sub activity 7.1.1. Assess project outputs from Phase one, analyze existing relevant policies on the issues at hand, and identify key issues for policy consideration	Desk review of policy and project documents	Beza, Feras, and Wondimu	Actionable policy recommendation	June/July 2014	\$4,000
Activity 7.2. Analyze outputs from selected activities and identify key issues for policy consideration	Sub activity 7.2.1. Analyze the data collected through activity 1.1.2. and identify key statistics for use in policy briefs	Data analysis	Beza, Nigus	The information collected/outputs (existing environmental conditions, farmers' perceptions, socio-economic characterization, suitability mapping, best practices from the respective activities will be used to identify policy recommendations and develop policy briefs	January 2015	\$2,000
	Sub activity 7.2.2. Examine land suitability assessments conducted through 1.2.1 and 1.2.2. to identify key points for policy recommendation	Report analysis	Beza, Feras, Hailu		Dec 2014	-
	Sub activity 7.2.3. Identify significant findings from the study on farmers' perceptions (2.1.1, 3.3.1 and 4.2.) for inclusion in policy briefs/recommendations	Report analysis	Beza, Yigezu, Yonas, and Mesfin		Feb 2015	-
	Sub activity 7.2.4. Develop a booklet/leaflet on best package (5.1.1.4) for use in policy briefs	Report analysis	Beza, Mesfin		Jan/Feb 2015	-
	Sub activity 7.2.5. Develop a booklet/leaflet on best practices (5.1.1.5) on soil drainage and fertilizer application, and on best sheep fattening strategies (5.1.2.2/6), fodder (5.1.2.8) for inclusion in recommendation package	Use the output to be generated by the respective activities including 5.1.2.9	Beza, Tsedalu, and Tikunesh		Jan/Feb 2015	-

Output 7: Technical and policy recommendations for best climate change adaptation strategies and SLM practices.

Activity	Sub-Activity	Methods	Team	Outputs	Delivered by (Date)	Budget (USD)
Activity 7.3: Dissemination and promotion of research results for greater impact.	Sub activity 7.2.1. Develop brochures for proven technologies/innovations and/or management packages	Assess project outputs	Beza and output leaders	Brochure with complete information on the technology developed	Jan/Feb 2015	-
	Sub activity 7.2.2. Identify additional inputs required to promote dissemination e.g. credit, technical skills, etc.	Assess project outputs	Beza and output leaders	Additional needs identified	Feb 2015	\$2,000
	Sub activity 7.2.3 Identify potential collaborators/partners to help us disseminate the technologies	Approach governmental and non-governmental institutions	Beza , Feras, Wondimu	Partners identified	March/April 2015	\$2,000
Activity 7.4: Project final workshop - Results of the project activities will be synthesized and compiled and comprehensive technical and policy recommendations developed.	Sub activity 7.3.1. Write actionable policy recommendations and analytical report				Feb/March 2015	-