1. Activity Reporting.

Activity 608-2014

Integrating the crop trait ontology into AgTrials

Status	Cancelled	Milestone	1.1.3 2015 (2)
Start date	2012 Jan	End date	2015 Dec

Description: The Crop ontology that already serves traits/methods/scales to Agtrial for the metadata and for the query system of evaluaiton data s, will be expanded to additional breeders' traits for barley, musa, sweet potato to access the list fo 6 crops and will feed Agtrials. Semantic approach will be tested to see how to ponderate the relationships between traits. Environmental concepts will be enrich basde on Agtrials expertise. collected samples form the collecitng missiond atabase that have tait infromation will aslo be linked to the geospatial vizualiuzation.

Status: Cancelled. The connection between the Crop Ontology (www.cropontology.org) and Global Evaluation Trials Repository (Agtrials;www.agtrials.org) was successfully carried out until end of 2014. AgTrials uses the Crop Ontology trait concepts for annotating 29,633 trials out of the 34,329 uploaded by scientists and automatically synchronizes with the Crop Ontology to get the latest updates. The AgTrials team has collaborated with the Agricultural Model Intercomparison and Improvement Project (AgMIP) to make their data interoperable, therefore the Crop Ontology is considered important for including a standard list of environmental variables that will support the interoperability. This activity was discontinued for 2015 as it has been superseded by the new Bioversity portfolio 2015-2018, but there are still needs for further collaboration.

Gender Component: Not defined

Objectives:

1. Support the retrieval of breeders evaluation data and integration with other data types QTLs within the Inetgrated Breeding Platform (IBP).

Deliverables:

Description	Type	Year	Status	Justification
Ontology of environmental variables and experimental design variables used by IBP and crop models, done in collaboration with J. White and others (available on Crop Ontology website)	Platforms - Data Portals for dissemination	2014	On going	A first comparative list of existing variables to describe the evaluation environment (ICASA variables, Crop Research ontology, CISA) was produced after the workshop of the Crop Ontology Community held in April 2014 (http://tiny.cc/rw51ax). However, to produce a list of variables that would be meaningful for the lAgtrials and AgMIP, it was wiser wait for the interoperability schema to be finalized, which happened early 2015. The work may resume under the CGIAR Open Data Strategy umbrella.
Ontology for agronomical practices, in collaboration with CIMMYT and others (draft version - report)	Platforms - Data Portals for dissemination	2014	On going	A draft fieldbook template with a list of CSISA variables was developed using the template of the Integrated Breeding Platform (IBP). The limitation of this template is that a breeder fieldbook has an entry point on the crop while the Agronomy fieldbook needs an entry point on the evaluation trials, with a mix of species traits, in addition to the cultural practices. Additionnally, factors and constants applied for the breeder fieldbook are often variables in an Agronomy filedbook. Therefore, with this complexity, the activity could not go further than a draft list of variables that could not be yet published on the Crop Ontology site. This activity may resume under the umbrella of the CGIAR Open Data strategy.

Description	Type	Year	Status	Justification
The Crop Ontology project (www.cropontology.org) has two primary objectives for the Integrated Breeding Platform: (1) Publish online fully documented lists of breeding traits used by the Breeding Management System (BMS) for producing standard fieldbooks, and (2) Support data analysis and integration of genetic and phenotypic data through harmonized breeders' data annotation. The project also offers a forum for scientists to discuss their variables, methods and scales of measurement, and fieldbooks. In 2014, the number of online crop breeder Trait Dictionaries (TD) reached 18. They were produced with the CGIAR Crop Lead Centres and breeders from different regions for banana, barley, cassava, chickpea, common bean, cowpea, groundnut, lentil, maize, pearl millet, pigeon pea, potato, rice, sorghum, soybean, sweet potato, wheat and yam.	Data	2014	Complete	

Partners:

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Location(s):

Global

Activity 729-2014

User-friendly interface for environmental predictive germplasm characterization

Status	On going	Milestone	1.1.3 2014 (1)
Start date	2014 Jan	End date	2014 Dec

Description: Develop innovative user-friendly germplasm characterization and selection tool to enable smallholder farmers and researchers efficiently select targeted germplasm in adapting to climate.

Status: On going. An improved prototype of the R-statistical tool for trait-based selection of germplasm, called 'Explora', developed by M. van Zonneveld, J. Ospina and J. van Etten. Explora functions support germplasm selection on several traits, trade-offs between different traits of interests, and maximization of diversity for selected traits. A prospective study could be performed to check the possible integration of such a tool in the production of the mix of species useful for the restoration toolkit project. Explora is programmed in the R statistical language. Software engineering of the tool continued with the use of R using publicly available software engineering tools like R Studio (http://www.rstudio.com/) and publicly available CRAN packages (http://cran.r-project.org/mirrors.html).The open source code is versioned and released in Github at https://github.com/bioversity/explora. The full Git commit history of program changes is at https://github.com/bioversity/explora/commits/master. The attached Wiki site is being used as the host for enhanced "Getting Started" and related Explora documentation (see https://github.com/bioversity/explora/wiki). The latest project release is an Alpha –release 0.3.2. Test with various crop data sets and integration of metadata to describe the traits is necessary. At this stage the tool can be only used by scientists.

Gender Component: It will involve both men and women farmers in testing and evaluating and finally adopting the tool.

Objectives:

1. To contribute to the ability of smallholder farmers to adapt to the effects of climate change on crop production by identifying and accessing adapted varieties that suit their needs and local climatic conditions.

Deliverables:

Description	Type	Year	Status	Justification
Prototype of user-friendly interface to use the algorithms to select genebank accessions in an interactive way (developed in 2013) tested by end-users (report)	Platforms - Data Portals for dissemination	2014	Complete	
Final interface developed and harmonized with the framework of the Integrated Breeding Platform (software)	Platforms - Data Portals for dissemination	2014	Cancelled	The interface of Explora was slightly improved for advanced users but still requires additional development to obtain a solid user interface. The Integrated Breeding Platform professional release was performed in September 2014 and the Breeding Management System was released only with the robust modules that were finalized and fully tested by breeders. A germplasm list-building tool embedded into the Breeding Management System was not considered. Discussion can resume in the future to see possible links with the IBP workflow.
Guidelines for germplasm selection based on the final interface version under (2) (digital document)	Reference material (booklets and training manuals for extension agents, etc.)	2014	On going	The prototype redevelopment was achieved in December 2014 therefore an Introductory Explora Tutorial was posted on the wiki of the Github repository: https://github.com/bioversity/explora/wiki/Introductory-Explora-Tutorial This is a draft that will evolve with the user tests.

Description	Type	Year	Status	Justification
Exploration and testing of linking with environmental data (AgTrials, aWhere) (prototype software component)	Platforms - Data Portals for dissemination	2014	Cancelled	Explora worked well with the test case data of capsicum because the knowledge about the traits was available during the development. A test on Sorghum data downloaded from AgTrials demonstrated that more metadata are needed to describe the variables, document the abbreviated traits and scales, otherwise the direct use under Explora is impossible. So, it was decided to suspend the use of AgTrials evaluation data and environmental data for this first phase and keep this as a future development so Explora could load data sets directly from AgTrials (which was also redeveloped in 2014).

Partners:

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6- National Plant Genetic Resources Centre (NPGRC):
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7- National Bureau of Plant Genetic Resources (NBPGR):
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8- Rwanda National Genebank (RNG):
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Location(s):

Countries: Ethiopia, Kenya, Uganda,

Activity 609-2014

Seeds for Needs East Africa

Status	Complete	Milestone	1.1.1 2014
Start date	2010 Apr	End date	2014 Dec

Description: East Africa is a region rich in agricultural biodiversity and it is considered a major centre of crop domestication in Africa. Climate change is shifting the environmental conditions in which crops grow and alters their performance. Varietal diversification is the main adaptation strategy to temperature alterations, and the single most important strategy, after soil conservation, to changes in precipitation patterns.
Seeds for Needs is testing the performance of local and improved varieties which are available in national genebanks in different climatic conditions through a participatory process involving farmers, research partners, extension officers, national genebanks and universities. Different varieties of selected crops are grown in test sites and on farm trials. The idea is to speed up the customary selection process in the informal seed system and to model the potential of different varieties to determine yield outcomes and stability under variable weather and providing access to better adapted varieties. The increasing availability of crop modeling techniques provides information on the adaptation potential of different crops and varieties and allows farmers to select varieties likely to perform well now and in the future.
Besides researching the potential benefits of varietal diversification strategies to adapt to climate change, Seeds for Needs aims to improve farmers' access to information and seed material. Furthermore the program aims to strengthen farmers economic self-sustainability and boost the seed industry through the development of a market-based seed distribution system. Seeds for needs - East Africa has activities in Ethiopia, Kenya, Rwanda, Tanzania and Uganda

Status: Complete. Ethiopia:
Crowdsourcing: More than 400 new farmers from 24 villages were selected in May 2014 and given three days' training in a workshop that focused on project objectives. Farmers were trained on the use of crop diversity to adapt terminal drought; durum wheat production practices and how each farmer becomes an experimenter in this trial. Furthermore, sensitization on the possibility of forming cooperatives of durum wheat producers in the area was carried out.
Multilocation trials: This trial was put in place to register drought resistance varieties as varieties to enter into the national system. The goal is not just to test these varieties, but to create a precedent for registering landraces for climate adaptation. This trial is being conducted at four locations, Mekelle University, Hagreselam, Ayba and Korem, in Tigray to further evaluate 36 accessions (32 landraces and 4 improved durum wheat varieties) to identify candidate landraces for national release. All data have been collected as of end of January and analysis is underway.
Drought resistance experiment:This is an experiment initiated in 2012 and continued for more two years with funds from Scuola Superiore Sant'Anna and Bioversity International, due to the

remarkable diversity in the tested genotypes for terminal drought tolerance/resistance. This year we are testing 64 (54 + 12) durum wheat landraces and improved varieties for the third year to screen genotypes for their tolerance or resistance against terminal drought. Quite a substantial number of landraces showed consistent resistance to the imposed terminal drought. They stayed green for more than five weeks without a drop of water and also gave very good yield, both in terms of quality and quantity.
Community seed bank: we opened a community seed bank in Meket Woreda to strengthen the local seed system and ensure access to varieties that are well adapted to local climatic conditions.

Kenya and Tanzania:
A household survey using a modified version of the ImpactLite tool was implemented in two sites in Kenya (Wote and Nyando, both CCAFS benchmark sites) and in Hombolo, Tanzania. Data are now about to be analysed.
On-farm trials: Introduction of germplasm from the genebanks for testing of suitability for climate change adaptation (on-station and on-farm trials, crowdsourcing varieties). The activity included 1,500 farmers involved in crowdsourcing trials.
Modelling: Assessing the impact of climate change on specific crops through crop modelling.
Vulnerability study: Testing a toolkit for testing climate change vulnerability. A CCAFS working paper is about to be published presenting results from this work.

Uganda and Rwanda:
Situation analysis: The situational analysis involved assessing climate change within the community using farmers' perception on climate change and verifying this using data from meteorological stations and data from weather stations at the site; this was further verified using data from Worldclim and aWhere weather data which are online resources.The effects of climate change on farmers' livelihoods and their coping strategies were also documented. The diversity of beans in the community was assessed using participatory four cell analysis (FCA) and male and female farmers ranked their diversity according to selected traits.
Identification of bean accessions based on climate analogues and crops suitability modelling using GIS. Common bean varieties were screened using GIS and current climate datasets (Worldclim) to develop current climate profiles for each accession in order to develop a predictive tool to identify suitable varieties.
On-farm and on-station trails of the beans with farmers: The common beans were planted in season A 2014 (Oct. 2013- Jan. 2014). Each site had trials on three farmer's fields with the number of varieties from genebanks and including farmers' own varieties. A total of 20 varieties were tested on each site with five improved varieties also tested for comparison. Data on germination rates, plant height, pests and disease susceptibility, maturity rates, yields was collected and compared across varieties.
Participatory varietal selection with men and women farmers: The tested varieties were then rated by men and women farmers based on traits that they had agreed upon and the best varieties documented.

Gender Component: Understanding local production systems, crop productivity trends and farmers' crop variety preferences, including farmers' knowledge of climate change is crucial for delivering a successful intervention. Incorporating the experience, concerns and knowledge of both men and women into our research and considering the implications our actions have on different groups within society forms an intrinsic part of our work. Climate change has the potential to reinforce gender inequality if better suited crop varieties and crops are not compatible with women's preferences and constraints, and adaptation strategies fail to address gender differences (CCAFS, 2012). Using data from household surveys based on interviews from male and female farmers of different age groups, creates understanding on how gender disparities affect the ways in which male and female farmers access planting materials. Integrating gender into our research allows us to address the gendered constraints and improve male and female farmers' ability to sustain food production in the context of changing climatic conditions through the increased use of plant genetic resources.

Objectives:

1. To identify and evaluate promising local varieties of barley and durum wheat from genebanks, using an innovative geographic information system (GIS) and participatory evaluation techniques, to meet the short- and long-term climate change-related challenges faced by farmers.
   In addition, in 2014 the following crops will be added: sorghum, pigeon pea and cowpea in Tanzania and Kenya; common beans in Rwanda and Uganda.
2. To improve farmers' access to genebank materials through the establishment of a seed dissemination system, also enabling the scaling-up of the project at the national level.
   Crowdsourcing will be one of the options tested to enhance access, and to collect additional information on variety performance.
3. To build the capacity of national scientists on documentation systems, GIS techniques and use of collections.
4. To understand the crop systems and productivity.
5. To understand local seed systems.
6. To understand farmers' knowledge and concerns about climate change.

Deliverables:

Description	Type	Year	Status	Justification
Finalization of molecular and phenotypic characterization of 400 accessions of durum wheat in different environments (dataset). Note: this deliverable is funded through partnerships with Scuola Superiore Sant'Anna in Pisa, Italy.	Books	2014	Complete	
Analysis of crowdsourcing data from at least 3 countries (Kenya, Tanzania and Ethiopia) (report)	Peer-reviewed journal articles	2014	Complete	
Baby trials completed in at least three countries for assessing farmers preferences and traits (dataset)	Data	2014	Complete	
At least one peer-reviewed publication submitted on Seeds for Needs East Africa work (article)	Peer-reviewed journal articles	2014	Complete	
Testing sorghum, cowpea and pigeon pea along a gradient of climatic conditions in Kenya and Tanzania (dataset)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	

Partners:

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Location(s):

Benchmark Site: Nyando (Katuk Odeyo), Makueni (Wote), Kagera Basin (Rakai),

Regions: East Africa (EA),

Activity 611-2014

Seeds for Needs PNG - Matching seeds to needs: using locally available varieties for adapting to climate change and improving the livelihoods of poor farmers in Papua New Guinea (PNG)

Status	Complete	Milestone	1.1.1 2014
Start date	2010 Jun	End date	2014 Jun

Description: This project is taking place in Papua New Guinea (PNG) and aims to identify conserved sweet potato and taro varieties that are adapted to climate change conditions, in addition to helping local communities' farming systems adapt to environmental stresses caused by climate change. Improving the resilience and adaptation of agricultural systems in PNG will help ensure food security and farmers' livelihoods.

Status: Complete. This project is successfully completed and I am sending you the following reports for uploading. The overall outcome of the project is well documented in the success stories we have documented in the deliverables that follow.

Gender Component: The PNG Women in Agricultural Development Foundation will play a key role in ensuring the participation of women farmers in germplasm selection and dissemination, assisted by private industries in PNG such as the Fresh Produce Development Agency (FPDA) and Allele Fresh Produce.

Objectives:

1. Identify of crop production areas most threatened by climate change;
2. Identify of the varieties of target crops adapted to future climatic conditions in those areas.
3. Develop the participatory strategies for adapting production of the target crops to changing environmental conditions.
4. Develop improved seed multiplication and delivery systems.
5. Document at least one case study of a farm in each pilot site.

Deliverables:

Description	Type	Year	Status	Justification
Final project report	Peer-reviewed journal articles	2015	Cancelled	
Final Technical Report to Bilateral Donor	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
S4N - PNG - Occasional/Discussion/Working papers	Working Paper	2014	Complete	
S4N - PNG - Socioeconomic report based on baseline survey	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
S4N - PNG - News Articles / Blogs - Example 1	Social media outputs (including web sites, blogs, wikis, linkedin group, facebook, yammer, etc.)	2014	Complete	

Description	Type	Year	Status	Justification
S4N - PNG - News Articles / Blogs - Example 2	Social media outputs (including web sites, blogs, wikis, linkedin group, facebook, yammer, etc.)	2014	Complete	

Partners:

1- National Agricultural Research Institute (NARI):
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Location(s):

Countries: Papua New Guinea,

Activity 610-2014

Seeds for Needs China

Status	Complete	Milestone	1.1.1 2014
Start date	2010 Jan	End date	2014 Dec

Description: The project aims to promote the use of crop genetic diversity to adapt to climate change, and contribute to food security and sustainable agricultural development in China.

Status: Complete. This activity was carried out in Yunnan and Sichuan provinces in China. The activity aims to promote the on-farm management of traditional crop diversity and their availability under changing environments, enhance the adaptability of traditional crop diversity to climate change for resilient farming system and empower farmers in managing climate risk for sustainable livelihoods. The activity mainly involved in the survey on diversity, climatic, social and economic status in project sites, and carrying out the field tests of buckwheat and oat accessions in households of project sites. Six households in each of two sites and 6 varieties for each of buckwheat and oat were selected for the adaptable experiments. The plot area is not less than 20 square meters. Farmers were directly involved in evaluation of accessions. The best accessions were directly made available to local farmers.

Gender Component: Local women will be invited to participate in the evaluation of the accessions of buckwheat and oat in the field trials. Group discussions including women were organized to listen in their opinions and comments. The roles of women in identifying the use values of buckwheat and oat were integrated into the reports.

Objectives:

1. Provide options to local farmers for income generation through developing participatory methodologies to evaluate genetic diversity of buckwheat and oat for adaption to climate change, screening local varieties with resistance to biotic and abiotic stresses, and piloting good practice in use of crop genetic diversity to adapt to climate change;
2. Improve the breeding of buckwheat and oat through integrating phenotypes and genotypes of resistant traits (resistance to pest, disease, drought, etc).
3. Advance the knowledge and ability of young scientists and local communities in using crop genetic diversity to adapt to climate change through training activities.

Deliverables:

Description	Type	Year	Status	Justification
Data on accessions of buckwheat and oat adaptable to climate change (dataset)	Data	2014	Complete	
Accessions of buckwheat and oat with adaptability to climate change deployed and used by local farmers (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Peer-reviewed paper on evaluation and use of buckwheat and oat adaptable to climate change (submitted paper)	Peer-reviewed journal articles	2014	Complete	

Partners:

1- Institute of Crop Science CAAS (ICS, CAAS):
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Location(s):

Countries: China,

Activity 750-2014

Seeds for Needs South East Asia

Status	On going	Milestone	1.1.1 2014
Start date	2013 Apr	End date	2015 Dec

Description: In the face of predicted changes in climate, the seeds accessed through this activity will help ensure the continued production of these staple foods to feed an expanding population. The activity will enable communities in Laos and Cambodia to adapt food production to changes in climate and with a potential to impact upon some 10,000 smallholder farmers, ensuring they do not fall into deeper poverty. More specifically, by working with partners in Laos and Cambodia, local communities and women's groups, this activity will help identify crop varieties that are hardy and able to grow in tough conditions as well as those valued the most by farmers, matching them with the areas where they will be most needed. GIS technology, environmental data, and scientists will be used to test and identify the most climate ready seeds. Indigenous farming communities will be equal partners, and will be supported to use and share traditional knowledge. Local seed systems will be examined and strengthened by building on the traditional knowledge of the farmers and current methods for exchanging seeds, ensuring the widest access to seeds held in genebanks and on others farmers' fields.

Status: On going. The project aims to identify, test and disseminate seed varieties that are best adapted to a broad range of environmental conditions, using Geographic Information System (GIS) technology, environmental data and information management. Training will be provided to increase the capacity of government decision-makers and technical staff, and several awareness-raising activities for communities undertaken. Ultimately, a farmer-based 'experimentation network' in the Mekong River Basin region for the testing of selected planting materials will be established.

In Laos and Cambodia the cropping practices range from single rice cropping to 3 time rice cropping system. Single rice cropping season is due to weather constraints. Where 3 cropping seasons of rice is practiced, there are very few secondary crops. Such a system is vulnerable to climate changes due to the tight cropping schedule that can be disrupted with weather changes. The rice diversity in Laos is 12 local varieties and 17 improved varieties based on the survey where as in Cambodia there are 35 local varieties recorded and only 9 improved varieties. These provide a baseline to see the impact of interventions that will be carried out in the project. Conservation of a large number of varieties poses challenges for the farmers who will inevitably displaced varieties with declining yield. The community seed bank concept that is being implemented in the project beginning with the ultra-dry seeds experiment will address the challenges of managing and conserving crop diversity.

Of concern in the survey was the percentage of respondents, 90% Laos and 71% in Cambodia who did not do any interventions even though many have noticed climate change. There is a general lack of access to knowledge about climate change and its impact on agriculture. There is big role for Farmer Field school to educate farmers about climate change, its impact and risk mitigation. The

training activities will be carried out during the field trials and supported with public awareness posters and information leaflets.

The advances in information technology had provided the project with opportunity to adopt them in project work with partners and farmers. Using the HP Slate7 tablets, data entry forms were created for the device to collect survey data directly in the field. Effectively removing the need for post survey data entry. It provides opportunity in linking community seed banks to the national genebanks for technical back stopping support. A weekly reporting on-line system was developed to allow partners to report back on activities as they occur and to develop a weekly newsletter to update all concern in 2015.

The activities in the next phase will addressed the needs identified in the surveys in both countries. These includes;

1. Field trials for climate ready collections will be carried out with at least 50 farmers in each country with quantitative and qualitative data recorded.
2. Public awareness materials will be developed and distributed to ensure that farmers are introduced to the impacts of climate change, how to mitigate the risk and information about the field trials.
3. Climate Field School to conduct training in the community on climate change, use of genetic diversity and agronomic practices to adapt to climate change, seed selection and community seed bank.
4. A farmers field day and seed fairs will be organised at the end of the field trial to enable farmers to compare their seeds and those from the climate ready collection.

Gender Component: Through working with partners in Laos and Cambodia, local communities and women's groups, women farmers will directly participate in germplasm selection and dissemination.

Objectives:

1. Identify varieties of target crops best adapted to future climatic conditions;
2. Establish a large farmer-based experimentation network in both Cambodia and Laos;
3. Develop an efficient system to gather and describe crops from both ex situ and in situ collections and record traditional farmer knowledge about crop adaptation for climate change adaptation
4. Develop improved seed multiplication and delivery systems
5. Document at least one case study of a farm in each pilot site

Deliverables:

Description	Type	Year	Status	Justification
Baseline study (database and report)	Peer-reviewed journal articles	2014	Complete	This deliverable was produced as a Technical Project Report.
Site descriptions	Other	2014	On going	This will be ready in early 2015.
S4N - SEA - Household Data and Focus Group Discussions	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	

Partners:

1- National Agriculture and Forestry Research Institute (NAFRI):
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Location(s):

Countries: Cambodia, Laos,

Activity 751-2014

Seeds for Needs Central America

Status	On going	Milestone	1.1.1 2014
Start date	2013 Jan	End date	2015 Dec

Description: This activity is directed at implementing and perfecting two components of the Seeds for Needs approach: crowdsourcing variety selection and collecting weather data with microsensors in order to determine variety performance and preferences in relation to climate.

Status: On going. A good foundation has been laid methodologically for the next phase with good new insights in the crowdsourcing methodology and the use of small sensors. The latter proved to be more complicated than thought initially and we decided to invest more in assessing the feasibility of using existing data, such as CHIRPS (FEWS NET/UC Santa Barbara). We have 3 articles in the pipeline on the results. A training was completed on the use of ClimMob, the software to design and analyze crowdsourcing experiments, in Honduras.

Gender Component: We will disaggregate data from male-headed and female-headed households. Women will be actively involved in variety evaluation, especially for culinary aspects of bean varieties.

Objectives:

1. Developing the crowdsourcing variety evaluation methodology as part of Seeds for Needs
2. Developing methods for collecting and interpolating weather data using microsensors for use in detailed climatic characterization to evaluate the performance of crop varieties and other climate adaptation options

Deliverables:

Description	Type	Year	Status	Justification
Crowdsourcing crop improvement with at least 200 farmers with beans in Honduras (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	The second bean cycle in Honduras is from October to January, so only now we have the full results from the trials. Good progress has been made on all aspects not related to this last growing cycle.
Detailed downscaled weather data collection methodology with small robust sensors fully developed (manual)	Peer-reviewed journal articles	2014	On going	We will publish these results as a working paper in 2015. We will make the data available in a more documented format. The data are now available on GitHub. We will update the iButton manual following the insights obtained from this work.
At least 3 partners trained in using the CCI methodology, including weather data collection	Capacity	2014	Complete	

Partners:

1- Escuela Agricola Panamericana Zamorano:

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Location(s):

Countries: Honduras,

Activity 613-2014

Seeds for Needs India - Broadening the genetic base of crops to empower farmers for climate change adaptation through crowdsourcing

Status	On going	Milestone	1.1.1 2014
Start date	2013 Jan	End date	2015 Dec

Description: This main aim of this activity is to improve farmers' access to adapted genetic materials of the main food crops and newly introduced crops (diversification) and to study and strengthen the local seed system network.

Status: On going. Wheat crowdsourcing trials are being undertaken by 15,000 farmers across four states of India and includes: Bihar, Uttar Pradesh, Madhya Pradesh and Chhattisgarh.

Gender Component: This activity is gender sensitive, engaging both male and female farmers in the on-farm trials and in project implementation. Disaggregate analyses of results will also be produced based on gender and diversity.

Objectives:

1. To establish farmers experimental network to test and validate adaptive varieties using participatory and crowdsourcing approaches
2. To diversify the farming system with different varieties and crops.
3. To strengthen the local seed system through the establishment of community seed banks (CSBs)
4. To strengthen the link between researchers, extension workers and local farmers in the context of adaptation to climate risks
5. Capacity building of all stakeholders through workshops and trainings

Deliverables:

Description	Type	Year	Status	Justification
Crowdsourcing crop improvement (CCI) for basebroadening with 15000 farmers (report)	Articles for media or news (radio, TV, newspapers, newsletters ,etc.)	2015	Cancelled	
Establishing local seed system	Peer-reviewed journal articles	2015	Cancelled	
Peer-reviewed publication on crowdsourcing submitted (article)	Peer-reviewed journal articles	2014	Extended	Harvesting during the rice season was late at some sites and commenced simultaneously with the start of the wheat season. As such, partner organizations concentrated on wheat sowing before they could complete the collection of data from the rice trials. The data was delivered at the end of January 2015 and is being cleaned and analyzed. Work on the paper is on-going and shall be completed soon.
Farmer's Field Day Training	Capacity	2014	Complete	
Training on data collection using tablets to partners and field staff	Capacity	2014	Complete	
Wheat (2013-14) farmers' network and preference data for crowdsourcing trials from 5000 farmers Wheat (2013-14) PVS trials' data Rice (2014) farmers' network and preference data for crowdsourcing trials from 7000 farmers Rice (2014) PVS trials' data	Datasets	2014	On going	The rice data from partner organizations arrived in January 2015 and is now being cleaned and added to the database. On completion, it will be uploaded.
Wheat (2014-15) farmers' network and preference data for crowdsourcing trials from 15,000 farmers Wheat (2014-15) PVS trials' data	Datasets	2015	Cancelled	

Description	Type	Year	Status	Justification
Wheat (2014-15) farmers' network and preference data for crowdsourcing trials from 15,000 farmers Wheat (2014-15) PVS trials' data	Datasets	2015	Cancelled	
Weather data from selected sites collected through micro sensors	Datasets	2014	On going	Field staff from partner organizations have been provided with handheld data readers to download the data. However, a few of the data readers have malfunctioned and are being repaired/replaced. Since the iButtons cannot be removed (they are collecting the data for the on-going wheat season), the iButtons cannot be sent back to us for data downloading. Once the data readers are replaced, the weather data shall be downloaded and added to the database.
S4N - India - News Articles from project sites - Example 1	Articles for media or news (radio, TV, newspapers, newsletters ,etc.)	2014	Complete	
Manual on Seed production Technology for Improved and Traditional varieties	Reference material (booklets and training manuals for extension agents, etc.)	2015	Cancelled	
Community Seed Banks and their documentations	Reference material (booklets and training manuals for extension agents, etc.)	2015	Cancelled	

Description	Type	Year	Status	Justification
Manual on Collecting Weather Data in the Field with High Spatial and Temporal Resolution Using iButtons	Reference material (booklets and training manuals for extension agents, etc.)	2014	Extended	The update was meant to include the performance of the iButtons in the field based on the data collected over the last few seasons. Since data from some sites are still to be provided by partner organizations due to the need for replacement of the data readers, this update on the manual has been delayed and shall be completed once the data has been received.
Crowdsourcing trials in rice	Working Paper	2015	Cancelled	
Crowdsourcing trials in wheat	Working Paper	2015	Cancelled	
Varietal selections by farmers in rice and wheat in IGP and Central India	Working Paper	2015	Cancelled	
Seed Production and Conservation training across 8 sites in Bihar and Uttar Pradesh	Capacity	2014	Complete	
Seed Bank, Seed Conservation, Seed Production training across 7 sites in Uttar Pradesh	Capacity	2014	Complete	
ICT and Database Management for Community Seed Bank management across 4 sites in Bihar, Jharkhand, Uttarakhand and Delhi	Capacity	2014	Complete	
Training on 'GIS and Climate Analogue Tools for PGR Management and Enhanced Use' for partners	Capacity	2014	Complete	
Training on On-Farm Seed Storage with the help of Desiccants	Capacity	2014	Complete	
S4N - India - Posters for presentation of project activities	Poster	2014	Complete	

Partners:

1- Indian Agricultural Research Institute (IARI):

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4- Action for Social Advancement (ASA):
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5- Borlaug Institute for South Asia (BISA):
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6- Humana People to People India:
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7- Gene Campaign:
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Location(s):

Countries: India,

Benchmark Site: Vaishali,

Activity 753-2014

The potential of neglected and underutilized crops to contribute to climate resilience of rural households

Status	On going	Milestone	1.1.3 2015 (1)
Start date	2014 Jan	End date	2015 Dec

Description: The activity has three parts: 1) Trials for assessing contribution of resilience across species and varieties of minor millets and Andean grains in close participation of farming communities of India, Nepal and Bolivia. The trials will be designed in such a way we can run a simple crop model using these data as input in order to simulate yields over various years ; 2) Dissemination of results from trials and modeling analysis to farmers and practitioners of communities from target countries (India, Nepal and Bolivia). ; and 3) Development of 2 business plans for the production and marketing of high quality seed of resilient crops through joint ventures with small and medium sized seed companies.

Status: On going. Activities 1 and 2 have work completed and ongoing, Activity 3 has been delayed because it is linked to a new large grant from IFAD that was expected to start in 2014 but has been delayed till 2015.

Gender Component: The gender integration is related to the three deliverables: Deliverable 1 and 2) gender-disaggregated assessments of performance of target crops designed to better understand perceptions by women and men farmers of valuable traits in target crops and how these can be leveraged in coping strategies; and Deliverable 3) equal participation of women and men in the production and marketing of high quality seed of resilient crops will be pursued in the development of the business plans.

Objectives:

1. Validate claims over perceived resilience in traditional crops and simulation of yields over several years of their cultivation.
2. Share with farmers and practitioners results of participatory trials and crop modeling.
3. Producing a viable business model for high quality seed production of resilient crops with the active involvement of small and medium sized companies.

Deliverables:

Description	Type	Year	Status	Justification
Assessing contribution of resilience across species and varieties of minor millets and Andean grains through (participatory) trials in India, Nepal and Bolivia. The trials will be designed in such a way we can run a simple crop model using these data as input in order to simulate yields over various years. (report, database)	Peer-reviewed journal articles	2014	On going	This activity is linked to the IFAD-NUS III-IV project which continues into the first part of 2015. The paper has been prepared through a collaborative effort in December and will be submitted for publication in 2015.
3 workshops for sharing outcomes of comparative trials involving resilient crops involving farmers, extension workers, experts and other stakeholders form target areas. (report)	Capacity	2014	On going	All the focus groups have been completed in Bolivia. Most of the focus groups have been carried out in Nepal and India but the letters of agreement for the activity continue into early 2015 so the data have not yet been received.
Development of 2 business plan for the production and marketing of high quality seed of resilient crops through joint ventures with small and medium sized seed companies.	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Extended	This activity was linked to the new IFAD grant that was expected in 2014 but has been delayed to 2015
Intensive writeshop in Nepal to compile results from activities on documenting, monitoring, characterizing and marketing underutilized crops to strengthen on-farm conservation and climate resilience of farms in Nepal undertaken in the IFAD-NUS project phases III and IV.	Capacity	2014	Complete	

Description	Type	Year	Status	Justification
A survey was carried out in early 2014 of scientists, researchers, and farmer gathering information on stress tolerant traditional crops that could be important in adaptation to climate change through diversification of production systems or replacing more vulnerable crops.	Data	2014	Complete	
Publication in LEISA magazine on work done creating a network of custodian farmers in Bolivia through the IFAD-NUS project	Peer-reviewed journal articles	2014	Complete	
Conference paper on 5-cell method for participatory monitoring of crop diversity	Conference proceedings/papere	2014	Complete	The proceedings have not yet been published but the paper was completed in 2014
Focus group discussions on role of traditional crops in climate change adaptation (Nepal, India, Bolivia)	Data	2014	On going	All the focus groups have been completed in Bolivia and data have been compiled. Most of the focus groups have been carried out in Nepal and India but the letters of agreement for the activity continue into early 2015 so the data have not yet been received.
Action plan emerging from the 3rd International Conference on Neglected and Underutilized species (NUS) – for a food-secure Africa, held in Accra, Ghana.	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Policy brief for realizing the promise of NUS	Policy briefs - Briefing paper	2014	Complete	

Description	Type	Year	Status	Justification
Thesis on climate change survey in Nainital, India (published in 2013 but not reported)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Article on diversity fairs held in Bolivia under the IFAD-NUS project published in an INIAF proceedings. Diversity fairs were promoted to strengthen on-farm conservation and encourage exchange of knowledge and seeds useful for addressing climate change.	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Article on results of the Bolivia climate change survey	Peer-reviewed journal articles	2014	On going	This paper was initiated in 2013. In 2014 the analysis of the survey data was completed and the paper was drafted but some follow up with the communities was required to effectively assess the research questions: what is the role of traditional crops in farmer adaptation strategies and what are opportunities to enhance their contribution to adaptation.
Article on South Asian climate change survey	Peer-reviewed journal articles	2014	On going	This paper was initiated in 2013. In 2014 the analysis of the survey data was completed and the paper was drafted but some follow up with the communities was required to effectively assess the research questions: what is the role of traditional crops in farmer adaptation strategies? And what are opportunities to enhance their contribution to adaptation?

Description	Type	Year	Status	Justification
New IFAD and EU grant on underutilized crops and climate change adaptation	Capacity	2014	On going	The research proposal was developed in 2014 and will be executed in 2015.
NUS community website restructured as an information hub on neglected and underutilized species research, with the section on climate change adaptation highlighted as a prominent research focus.	Social media outputs (including web sites, blogs, wikis, linkedin group, facebook, yammer, etc.)	2014	Complete	
Participation in the Indigenous Terra Madre	Workshop	2014	Complete	
Proceedings from a meeting of custodian farmers in Nepal in July/August 2013, featuring in-depth profiles of the custodian farmers who participated in the meeting and have been involved in other aspects of the IFAD-NUS project.	Books	2014	Complete	

Partners:

1- Local Initiatives for Biodiversity Research and Development (LIBIRD):
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2- Fundación para la Promoción e Investigación de Productos Andinos (PROINPA):
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Location(s):

Countries: Bolivia, India, Nepal,

Activity 754-2014

Resilience through climate risk management in multi-strata perennial crop systems

Status	Cancelled	Milestone	1.1.3 2015 (1)
Start date	2014 Jan	End date	2017 Dec

Description: In Latin America more than 1 million households produce coffee with multi-strata agroforestry, including banana. Coffee is the primary income concentrated in a single period of the year, banana generates much less income, but at least monthly, while trees provide occasional income as well as a micro-environment which reduces both the costs of external inputs and the variability of coffee yields through nitrogen fixation, deep nutrient cycling and temperature and light regulation.
Although farmer management strategies for their multi-strata coffee fields and farms have been refined over decades, numerous new factors are putting the system under pressure to change. Factors such as new markets, certification and quality control call for increased farmer administrative competence and may also affect traditional labor practices like tree pruning with a high cost for insurance or payment of worker damages. These factors call for a slow and gradual response when contrasted with other factors such as climate change and variability, pest and disease outbreaks and price fluctuation for coffee, off-farm inputs and food staples. All of these factors, except climate change, have been present for smallholder coffee households for many decades, but their effects may be accentuated by interaction with climate change. Tools, knowledge and practices on the management of complex systems under conditions of variability and uncertainty can strengthen the ability of smallholder households to address risk and resilience.

Status: Cancelled. This activity had a two year duration beginning in 2013 and ending unexpectedly in 2014. The idea that any or all trees are an appropriate climate change adaptation strategy for multi-strata perennial crops with banana still needs to be addressed by targeted tools. We made useful progress to develop a framework for such work which will continue at a modest level with Humidtropics learning platforms in Nicaragua and Dominican Republic/Haiti. The ecological niche modeling already nearly complete for leguminous shade species will be extended to include timber species and native fruits from dry zones which may migrate to the current day coffee zones. Screening tools through pot trials on trees are being piloted. A framework of multi-strata functional traits which need to be screened against both average climate change and specific types of weather events has been proposed, but needs to be developed. A better understanding of household risk and resilience through agroecological intensification practices also needs ground truthing and a conversion into specific management routines that build on metabases. The activity team proposed follow-up outputs to two different proposals developed for CCAFS. Initially a partnership was formed with a Bioversity proposal but later eliminated when budgets needed to be trimmed to meet guidelines.

Gender Component: Tools and strategies for smallholder households will address the different roles of men and women and their next generation in managing risk and resilience, particularly how men and women are influenced in issues like income, food security and nutrition and ecosystem services. Emphasis is on their roles in decision making, resource control and implementation of improved approaches.

Objectives:

1. develop tools, knowledge and practices for use by smallholder households for the management of multi-strata perennial crop fields under conditions of increasing climate variability - extended droughts, heavy rains, excessive winds and their effects on trees and crop components of multi-strata system
2. develop tools, knowledge and practices for use by smallholder households to achieve greater resilience and to address risk for their farms dominated by multi-strata perennial crop fields - income, nutrition and food security, gender and generational impacts and their interaction with scenarios of climate variability, commodity price, pest and disease outbreaks and other dimensions of global change
3. pilot strategies for increasing public awareness and influence policy on the role of alternative approaches to making multi-strata farms, communities and landscapes more climate change ready

Deliverables:

Description	Type	Year	Status	Justification
Moderate and extreme weather events occurring in zones with multi-strata coffee and cocoa characterized	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	On going	Additional methods are being developed for analyses based on actual weather station data. Data sets are also pending for these two sites which will form part of a Fontagro project on the management of water resources in multi-strata coffee with bananas in Nicaragua and Dominican Republic. The complete analysis will be used by the learning alliance for these coffee territories in action sites for Humidtropics. The methods have also been proposed as part of a CCAFS grant on multi-strata coffee with Bioversity.

Description	Type	Year	Status	Justification
Literature review and electronic consultation on the functional characteristics useful for multi-strata systems under changing and more variable climate and the implications for the functional characteristics of individual species	Workshop	2014	On going	during the end of last year and early 2014 we attempted to find a consultant to complete the literature review as a first step to the electronic consultation. We were unsuccessful in this effort and were unable to complete the review among the collaborating scientists. The electronic consultation was proposed to take place prior to a workshop organized by the Platform for Perennial Crop Agroforestry on the design of agroforestry systems with perennial crops. This research platform is led by CATIE and CIRAD. Based on several background papers on functional traits a presentation was given for discussion on possible dimensions of functional traits for a multi-strata system made up of several tree species. This framework still needs to be developed further, but this will need to be done with through PCP outside of the CRP framework or through Humidtropics. This framework was also promoted in the multi-strata coffee project funded by CCAFS, but was not accepted for funding.

Description	Type	Year	Status	Justification
Modeling of the effect of climate change on the ecological niche of frequently used shade trees in coffee and cocoa systems.	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	On going	One of three niche modeling exercises has been completed and is being written up as a journal article. Ten leguminous shade trees used in multi-strata coffee in Mexico, Central America and Panama were used to develop local capacity in such modeling. Results showed that two species would become more common, while the other species would be less common. if they remain in their current climatic zone, coffee growers will have fewer species to choose from in their shade tree management. Similar procedures will be used to model timber trees in coffee plantations. A study has also just begun to look at the potential movement of native fruit trees from Central America into coffee zones under climate change. these two studies will be carried out in 2015 by students at UNAN Leon. Results of all studies will be presented to different coffee organizations in Nicaragua to explore the potential for trees to contribute to adaptation by coffee growers to climate change.

Description	Type	Year	Status	Justification
Protocol preparation to measure multi-strata structure and functions potentially linked to both greater productivity and system resilience with changing and more variable climate, plot establishment	Platforms - Data Portals for disseminati on	2014	On going	A protocol was prepared in preparation for a multi-year experiment which was set up for contrasting three different multi-strata systems - coffee under traditional extensive shade, coffee with intensive shade management and coffee with intensive shade management and bananas. A weather station and soil moisture data loggers will be used to collect microclimate data which can then be related to production data. Funding from CCAFS ended in 2014, but work with continue by Nicaragua University partner and results will be reviewed through Humidtropics learning alliance and the Bioversity CCAFS grant on multi-strata coffee systems.
Tool for routine management of multi-strata based smallholder farm linked providing a framework for risk management links elements in future years and organization of farm household experimentation groups to test and expand the tools to address additional dimensions and new perspectives on risk and resilience	Models (i.e. Agronomic Trials)	2014	Complete	
Literature review of risk and resilience frameworks for smallholder multistrata farm management	Peer-reviewed journal articles	2014	Cancelled	the literature review conducted for the preparation of terms of reference for the proposed deliverable were used in the presentation, but the consultancy was not contracted due to a lack of resources. The funds received for this activity were lower than expected. Bioversity will continue to work on the household risk and resilience model, but not through this activity with CCAFS.

Description	Type	Year	Status	Justification
study of the response of 6 legume tree species used commonly in multistrata coffee to light levels and temperature changes at three altitudes to understand their growth and functional characteristics in response to different climatic regimes	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Extended	the study was planned in early 2014 when seed collection began. with the nursery in place materials were obtained for light levels and controled growth, but this took several months longer than expected. Although nurseries were set up in August 2014, the light level screenhouses at three altitudes was only completed in January. Data collection will be for six months culminating in studies of photosynthetic response, The study will complement studies of ecological niche modeling with the same species

Partners:

1- Centro Agronómico Tropical de Investigación y Enseñanza (CATIE):
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2- Centre International de Recherche Agricole et du Developppement (CIRAD):
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4- Union de Cooperativas Agropecuarios San Ramon (UCA):
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Location(s):

Countries: Kenya, Tanzania, Uganda, Ghana, Guinea, Ivory Coast, Costa Rica, Dominican Republic, Haiti, Honduras, Nicaragua, Peru,

Activity 620-2014

Climate change impact study of bananas and plantains, coconut and cacao.

Status	Cancelled	Milestone	1.2.1 2015 (3)
Start date	2010 Jan	End date	2015 Dec

Description: Commodity crops like banana, cocoa and coconut offer challenges to climate change projection tools designed primarily for annual crops. Building robust climate change adaptation plans for these crops calls for parallel approaches – adapting and improving climate change modeling tools to the specific growth characteristics of semi-perennial and perennial crops and their pests and diseases, assessing and building appropriate partnerships for down scaling the focus of adaptation planning, compiling current crop management technologies to address variability and extreme events as a basis for addressing similar issues under climate change scenarios and carrying out climate change partners under a format of research for innovation. The commodity genetic resource networks and regional banana networks are proposed as appropriate partners for this work with diverse advanced research institutes. The activities in 2013 build on the review of existing tools and the initial development of new tools in 2011-12. With improved maps of banana which are being completed, modifications to Ecocrop suited to the growth characteristics and a framework for planning based on ecological response hierarchies and stakeholder capacities, we are moving toward more concrete planning tools. These will be piloted in 2013 with banana country partners in Latin America and East and West Africa.

Status: Cancelled. The proposed work on stakeholder tools to contribute to CC adaptation planning by banana, cocoa and coconut stakeholders focused on the finalization of work in Ecuador where results were presented as part of a workshop convened by FAO and the Ministry of Agriculture. A chapter with a global overview of the impact of climate chnage on banana was also completed as part of a book by FAO on the effect of climate change on global commodities. The chapter concludes that climatic zones suitable for banana will increase as temperature increases, although the likely increase in moderate and extreme weather events will generate risk and added costs to banana producers. A proposal to CCAFS for a global platform to link global and local learning for the management of weather variability in banana production was not accepted for funding. Fortunately a bridge fund was granted to allow work to continue in 2015. Proposed collaboration with the Asia regional banana network was dropped due to the higher priority given to a short term crisis from Fusarium wilt and Musa genetic resources. However, advances were made on four fronts: 1) the analysis of weather station historical data to quantify the frequency of extreme events, 2) the use of focus groups of lead growers, scientists and field technicians to clarify the nature of weather variability and management practices used, 3) profiling potential approaches for commodity sector stakeholders to plug into national and local climate adaptation strategies and 4) modification of the banana mapping tools to coconut and cocoa. Three deliverables were either postponed or funded through other sources of funding since the amount of the budget was lower than anticipated where deliverables were

identified.

Gender Component: The framework to capture current farmer and research experience with climate variability and extreme events will address agronomic practices based on gender differentiation. In smallholder households we will determine whose resources are used in banana production, who provides labor, who makes decisions and how does the fluctuation in crop performance affect the different members of the household. We will also monitor the makeup of our collaborating team in terms of gender.

Objectives:

1. Effects of climate change modeled and validated on a.) length of cycle and survival of major cultivar groups of Musa, taking into account monthly rainfall distribution and extreme weather events, b.) cocoa and coconut suitability, taking into account monthly rainfall distribution and other crop-specific factors;
2. Effects of climate change on geographic distribution and severity of major pests and diseases of Musa modeled and validation begun at global, regional and national levels.
3. Role of growing conditions on yields modeled based on alternative Musa crop growth/production models (integrated and for specific growth factors) for major cultivar groups and potential adaptation approaches pre-tested through modeling and existing field data.
4. Stakeholder (global, regional and national) planning of adaptation response strategies in Bioversity commodity crops (based on user-friendly, participatory tools and workshops).

Deliverables:

Description	Type	Year	Status	Justification
Effects of climate change on banana suitability - Article submitted: alternative mapping approaches to crop suitability for bananas compared and validated with AgTrial data on time from planting to flowering (article)	Book chapters	2014	Cancelled	
Study: smallholder management of banana in the face of moderate and extreme weather events across different climate zones – inventory of useful practices	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Cancelled	
Effects of climate change on cocoa suitability - Alternative suitability mapping approaches identified and tested for understanding climate change effects on cocoa diversity centers (report, maps)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Cancelled	
Effects of climate change on coconut suitability - Alternative suitability mapping approaches identified and tested for understanding climate change effects on coconut diversity (report, maps)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Cancelled	

Description	Type	Year	Status	Justification
Effects of climate change on Musa pests and diseases - Strategy for use of existing pest and disease models to project banana pests and diseases and nematode effects (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Cancelled	
Musa productivity modeling - Draft strategy for cultivar testing based on homologue and analogue for East and Central Africa with data collection approach for validation of existing crop growth models (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Cancelled	
User survey – what data and other inputs do national climate change adaptation initiatives need to incorporate banana, cocoa and coconut into their studies?	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Cancelled	
One national banana sector climate change adaptation planning strategy developed and reviewed by regional banana network	Workshop	2014	Cancelled	
Data base consolidation – software and hardware to monitor plantain growth and preliminary modeling using GxE data	Data	2014	Cancelled	

Partners:

1- Banana Research and Development Network for Latin America and the Caribbean (MUSALAC):
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2- Banana Research Network for Eastern and Southern Africa (BARNESA):
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4- Centro Internacional de agricultura Tropical (CIAT):
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5- University of Western Australia:
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6- Agricultural Model Intercomparison and Improvement Project (AgMIP):
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Location(s):

Regions: East Africa (EA), West Africa (WA), Latin America (LAM), South East Asia (SEA),

Activity 615-2014

Policy support for community genebanks: using diversity for climate risk management

Status	On going	Milestone	1.3.2 2015 (2)
Start date	2013 Jan	End date	2015 Dec

Description: Systematization of secondary data collection (grey lileterature on CSBs) in terms of climate change adaptation, and identification of strengths, weaknesses, and opportunities. Identification of pilot experiences that bring new germplasm to CSBs (e.g., from national genebanks) and analysis of experiences and lessons to date.

Status: On going. Secondary data collection was completed and data were analyzed. The quantity and quality of the secondary data collected were not very good. To complement the relatively weak secondary data sources, a collection of commissioned CSB case studies was analyzed on relevant aspects. Among these case studies, a small number represent interesting pilot experiences. The writing up of the research is now being finalized.

Gender Component: The extent to which gender influences decision making and diversity management and the governance of community seed banks is being analyzed. In many community seed banks, women and socio-economically disadvantaged groups participate actively and play important roles in contributing to adaptation to climate change.

Objectives:

1. CSBs play an increasingly important role in climate change adaptation efforts at local and national levels.

Deliverables:

Description	Type	Year	Status	Justification
Analysis of factors determining need for/viability of community genebanks as part of local/national climate risk management strategies in 8 countries (report)	Peer-reviewed journal articles	2014	On going	The search for, collection and analysis of secondary literature took more time and effort than envisioned and did not lead to satisfactory results. The required to search for and commission additional case studies, which took considerable time to complete.
Analysis of existing policies affecting community genebanks operation/effectiveness (report)	Book chapters	2014	Complete	

Partners:

1- Local Initiatives for Biodiversity Research and Development (LIBIRD):
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3- National Agricultural Research Organization (NARO):
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Location(s):

Countries: India, Nepal,

Activity 622-2014

Policy research on climate change, availability of adapted germplasm and benefit sharing as related to the work of the CGRFA, ITPGRFA Governing Body, and CBD COP.

Status	Complete	Milestone	1.3.3 2014.
Start date	2013 Jan	End date	2014 Dec

Description: Develop targetted interventions for international policy-making meetings where there are opportunities to influence development of policies to support increased availability and use of agrobiodiversity to adapt to climate change.

Status: Complete. Completed as planned for 2014. Similarly inspired work will continue from 2015 onwards under flagship 4 Activity 2014-385.

Gender Component: Not defined

Objectives:

1. International agencies revise/develop policies to facilitate/support availability and use of PGRFA for climate change adaptation.

Deliverables:

Description	Type	Year	Status	Justification
Technical inputs to inter-sessional ITPGRFA processes regarding policy support for availability and use of of germplasm for climate risk management. (policy brief)	Working Paper	2014	Complete	
Review of the projects that have been funded so far by the International Benefit-sharing Fund created under the International Treaty on Plant Genetic Resources for Food and Agriculture. Analysis of the objectives of the projects (e.g. climate change adaptation, sustainable use of crops, increasing farmers' system resilience), the partnerships, technology transfer patterns, capacity building involved and information exchange. Also analysing whether or not the projects contributed to local, national, regional or global public goods and whether or not CGIAR centres were involved and, if so, what their roles were.	Discussion paper	2014	Complete	
Summary description of CGIAR CRP (including CCAFS) contributions to non-monetary benefit sharing under the framework of the ITPGRFA	Discussion paper	2014	Complete	
Summary of multi-stakeholder group analysis of options to improve the functioning of the multilateral system of access and benefit-sharing under the ITPGRFA	Presentations	2014	Complete	
A comparative analysis of mechanisms under the ITPGRFA and a number of other international agreements to deliver capacity building, technology transfer and information exchange.	Discussion paper	2014	Complete	

Description	Type	Year	Status	Justification
Side event on 'Mutually supportive implementation of the Nagoya Protocol and the Plant Treaty', 6 October 2014, Convention on Biological Diversity - COP12, Biodiversity for sustainable development. 6–7 October 2014, Pyeongchang, Republic of Korea.	Presentations	2014	Complete	

Partners:

1- CGIAR Consortium Office:
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2- International Treaty on Plant Genetic Resources for Food and Agriculture (governing body) (ITPGRFA):
Shakeel Bhatti <shakeel.bhatti@fao.org>

3- Meridian Institute:
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Eric Welch <ericwelch@asu.edu>

Location(s):

Global

Activity 758-2014

Seeds for Needs Toolbox

Status	On going	Milestone	1.1.3 2014 (1)
Start date	2014 Jan	End date	2015 Dec

Description: Compilation of tools and methods for participatory identification of climate related stresses to cropping systems : preferred crop traits for adaptation; international sources of adapted germplasm; obtaining germplasm; participatory evaluation; continued availability and conservation of useful diversity. Complementary identification and promotion of policies and administrative practices to support the toolbox's research cycle

Status: On going. The new title is: A resource box for resilient seed systems. The resource box has eight modules. The time and effort required to compile useful references, write the module text and peer review drafts, has been considerable and more than anticipated. Advanced drafts of seven of the modules are completed and a first draft of the eighth is in progress.

Gender Component: Participatory tools and methods will be included in the resource box that capture the influence of gender with respect to identifying climate stresses and preferred traits, and evaluation of adapted germplasm. Knowledge gain will inform identification of policy interventions and best practices to support participation and empowerment of women and socio-economically marginalized groups. .

Objectives:

1. To increase the capacity of farmers' organizations and national programs to use crop diversity for climate change adaptation.

Deliverables:

Description	Type	Year	Status	Justification
'Tool box' of methods, tools, best practices for participatory identification of farmers needs for adaptive traits, potentially useful germplasm, obtaining, introducing and evaluating germplasm (website)	Social media outputs (including web sites, blogs, wikis, linkedin group, facebook, yammer, etc.)	2014	On going	The website has been created and at this moment has restricted access. The website will become active once the eight modules have been finalized.
Manual with an overview of methodology developed by Bioversity and new training exercises (germplasm exchange, Seeds for Needs, crowdsourcing) (manual - live web document)	Social media outputs (including web sites, blogs, wikis, linkedin group, facebook, yammer, etc.)	2014	On going	Priority has been given to finalizing the Resource box for resilient seed systems. A set of practical examples has been compiled, but not yet organized in manual form.

Partners:

1- National Agricultural Research Laboratories (NARL):
Mr. Richard Omara Ogwal <ricogwal@yahoo.co.uk>

2- Rwanda Agriculture Board (RAB):
Jean Rwihaniza Gapusi <gapusirj@gmail.com>

3- Local Initiatives for Biodiversity Research and Development (LIBIRD):
Dr. Pashupati chaudhary <pchaudhary@libird.org>

4- Centro Agronómico Tropical de Investigación y Enseñanza (CATIE):
Mr Eduardo Rolando Say Chavez <esay@catie.ac.cr>

5- Centre national de recherche agronomique (CNRA):
Dr Edmond Kouablan Koffi <kofiedmond@yahoo.fr>

6- Secretariat Permanent Commission Nationale de Gestion des Ressources Phytogénétiques (

SP/CONAGREP):
Dr Didier Balma <balma_didier@yahoo.fr>

7- Oficina Nacional de Semillas (ONS):
Ing Walter Paulo Quiros Ortega <wquiros@ofinase.go.cr>

Location(s):
Global

Activity 623-2014

Research on the implementation of the Treaty's multilateral system of access and benefit sharing for the exchange of germplasm useful to climate change adaptation - Costa Rica and Guatemala

Status	Complete	Milestone	1.3.3 2015
Start date	2012 Jan	End date	2015 Dec

Description: Work with broad range of partners in Costa Rica and Guatemala to identify and characterize six reference sites (3 in each country). For each site, assemble data on climate changes in recent years and related cropping stresses. Locate climate analogue sites in other countries. Narrow down suitability of analogous sites with additional research on targetted variables. Work with information/crop specialists to locate germplasm linked to analogue sites or other potentially well adapted germplasm. Seek to obtain adapted germplasm from providers in the analogue countries (or other organizations with collections of such materials) through the multilateral system of access and benefit-sharing, or subject to other laws and policies as may be in place if the materials are not in the MLS. If and when targetted materials are obtained in time in 2013, include them in particpatory evaluation trials. In most cases, trials won't be possible until 2014. Throughout 2013 and 2014, lessons learned from experiences will be documented and used to inform policy development processes related to the implementation of the multilateral system of access and benefit sharing of the International Treaty (and the Convention on Biological Diversity).

Status: Complete. Most work planned for in 2014 is complete. Project activities planned to continue in 2015 under flagship 4, activity 2014-88.

Gender Component: The influence of gender will be one of the variables included in the research on policymaking networks, and on access to genetic resources and related information.

Objectives:

1. Countries implement the International Treaty in ways that support use of crop diversity for climate change adaptation.

2. To test and improve efficacy of combined tools, methods, supportive policies, for national programs and farmers to identify, obtain and use improved germplasm for climate change adaptation.

Deliverables:

Description	Type	Year	Status	Justification
Based on work in previous years, continue to seek/obtain germplasm through the MLS (or default systems) and introduce/evaluate adapted germplasm, informed by climate matching and other germplasm identification methods (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	On going	It took longer than anticipated to train the national teams in the use of the tools to identify potentially adapted materials located within the countries concerned, or internationally. By now, the partners have identified candidate materials – demonstrating the potential value of facilitated access mechanisms – but they have not yet requested or received them.
Document policy and bureaucratic bottlenecks, lessons-learned (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Document policy and bureaucratic bottlenecks, lessons-learned (article)	Peer-reviewed journal articles	2015	Incomplete	
Identify policy options to overcome bottlenecks in the context of ITPGRFA, CBD and Nagoya Protocol implementation, and make technical contributions to national policy making processes (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Germplasm obtained and evaluated (data/report)	Data	2015	Incomplete	

Partners:

1- Oficina Nacional de Semillas (ONS):
Walter Quiros Ortega <wquiros@ofinase.go.cr>

2- Oficina Nacional de Semillas (ONS):
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3- Ministerio de Agricultura, Ganadería y Alimentación (MAGA):
Samuel Ajquejay Ajquejay <sammyajquejay@gmail.com>

4- Universidad del Valle:
Silvana Maselli <smaselligua@gmail.com>

Location(s):

Countries: Costa Rica, Guatemala,

Activity 624-2014

Research on the implementation of the Treaty's multilateral system of access and benefit sharing for the exchange of germplasm useful to climate change adaptation - Uganda and Rwanda

Status	Complete	Milestone	1.3.3 2015
Start date	2012 Jan	End date	2015 Dec

Description: Work with broad range of partners in Uganda and Rwanda to identify and characterize six reference sites (3 in each country). For each site, assemble data on climate changes in recent years and related cropping stresses. Locate climate analogue sites in other countries. Narrow down suitability of analogous sites with additional research on targetted variables. Work with information/crop specialists to locate germplasm linked to analogue sites or other potentially well adapted germplasm. Seek to obtain adapted germplasm from providers in the analogue countries (or other organizations with collections of such materials) through the multilateral system of access and benefit-sharing, or subject to other laws and policies as may be in place if the materials are not in the MLS. If and when targetted materials are obtained in time in 2013, include them in particpatory evaluation trials. In most cases, trials won't be possible until 2014. Throughout 2013 and 2014, lessons learned from experiences will be documented and used to inform policy development processes related to the implementation of the multilateral system of access and benefit sharing of the International Treaty (and the Convention on Biological Diversity). In Uganda these efforts will culminate, in 2014/15 with fully developed national strategies to implement the multilateral system.

Status: Complete. Work is ongoing, as planned. 2015 Deliverables will be reported under Flagship 4, PACCA and Activity 2014-385.

Gender Component: The influence of gender will be one of the variables included in the research on policy-making networks, and on access to genetic resources and related information.

Objectives:

1. Countries implement the International Treaty in ways that support use of crop diversity for climate change adaptation.
2. To test and improve efficacy of combined tools, methods, supportive policies, for national programs and farmers to identify, obtain and use improved germplasm for climate change adaptation.

Deliverables:

Description	Type	Year	Status	Justification
Based on work in previous years, continue to seek/obtain germplasm through the MLS (or default systems) and introduce/evaluate adapted germplasm, informed by climate matching and other germplasm identification methods (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Document policy and bureaucratic bottlenecks, lessons-learned (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Document policy and bureaucratic bottlenecks, lessons-learned (article)	Peer-reviewed journal articles	2015	Incomplete	
Identify policy options to overcome bottlenecks in the context of ITPGRFA, CBD and Nagoya Protocol implementation, and make technical contributions to national policy making processes (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	

Description	Type	Year	Status	Justification
Germplasm obtained and evaluated (data/report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Proposed interministerial policy to allocate mandates for mutually supportive implementation of the Nagoya Protocol and the ITPGRFA. Project partners have developed a draft MoU between the National Science and Technology Council (national competent authority for the Nagoya Protocol and the ITPGRFA), the National Environment Management Authority (proposed executing agency for the Nagoya Protocol) , and the National Agriculture Research Organization (proposed executing agency for the ITPGRFA) to establish who has responsibilities for implementing access and benefit-sharing mechanisms related to the Nagoya Protocol and the ITPGRFA.	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	On going	This is an unplanned-for deliverable in 2014. If accepted in 2015, it will be a cross-departmental policy adopted by three different ministries. It was not planned for finalization in 2014.

Partners:

1- Rwanda Agriculture Board (RAB):
Antoine Ruzindana Nyirigira <a_nyirigira@yahoo.fr>

2- Advocates Coalition for Development and Environment (ACODE):
Ronald Naluwairo <r.naluwairo@acode-u.org>

3- National Agricultural Research Laboratories (NARL):
John Mulumba Wasswa <curator@infocom.co.ug>

Location(s):

Countries: Uganda,

Activity 625-2014

Research on the implementation of the Treaty's multilateral system of access and benefit sharing for the exchange of germplasm useful to climate change adaptation - Burkina Faso and Cote d'Ivoire

Status	Complete	Milestone	1.3.3 2015
Start date	2012 Jan	End date	2015 Dec

Description: Work with broad range of partners in Cote d'Ivoire and Burkina Faso to identify and characterize six reference sites (3 in each country). For each site, assemble data on climate changes in recent years and related cropping stresses. Locate climate analogue sites in other countries. Narrow down suitability of analogous sites with additional research on targetted variables. Work with information/crop specialists to locate germplasm linked to analogue sites or other potentially well adapted germplasm. Seek to obtain adapted germplasm from providers in the analogue countries (or other organizations with collections of such materials) through the multilateral system of access and benefit-sharing, or subject to other laws and policies as may be in place if the materials are not in the MLS. If and when targetted materials are obtained in time in 2013, include them in particpatory evaluation trials. In most cases, trials won't be possible until 2014. Throughout 2013 and 2014, lessons learned from experiences will be documented and used to inform policy development processes related to the implementation of the multilateral system of access and benefit sharing of the International Treaty (and the Convention on Biological Diversity).

Status: Complete. Most work planned for in 2014 is complete. Project activities planned to continue in 2015 under flagship 4, activity 2014-88.

Gender Component: The influence of gender will be one of the variables included in the research on policy-making networks, and on access to genetic resources and related information.

Objectives:

1. Countries implement the International Treaty in ways that support use of crop diversity for climate change adaptation.
2. To test and improve efficacy of combined tools, methods, supportive policies, for national programs and farmers to identify, obtain and use improved germplasm for climate change adaptation.

Deliverables:

Description	Type	Year	Status	Justification
Based on work in previous years, continue to seek/obtain germplasm through the MLS (or default systems) and introduce/evaluate adapted germplasm, informed by climate matching and other germplasm identification methods (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	On going	It took longer than anticipated to train the national teams in the use of the tools to identify potentially adapted materials located within the countries concerned, or internationally. By now, the partners have identified candidate materials – demonstrating the potential value of facilitated access mechanisms – but they have not yet requested or received them.
Document policy and bureaucratic bottlenecks, lessons-learned (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Document policy and bureaucratic bottlenecks, lessons-learned (article)	Peer-reviewed journal articles	2015	Incomplete	
Identify policy options to overcome bottlenecks in the context of ITPGRFA, CBD and Nagoya Protocol implementation, and make technical contributions to national policy making processes (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	It took longer than anticipated to train the national teams in the use of the tools to identify potentially adapted materials located within the countries concerned, or internationally. By now, the partners have identified candidate materials – demonstrating the potential value of facilitate access mechanisms – but they have not yet requested or received them.

Description	Type	Year	Status	Justification
Germplasm obtained and evaluated (data/report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	On going	It took longer than anticipated to train the national teams in the use of the tools to identify potentially adapted materials located within the countries concerned, or internationally. By now, the partners have identified candidate materials – demonstrating the potential value of facilitated access mechanisms – but they have not yet requested or received them.

Partners:

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3- Centre national de recherche agronomique (CNRA):
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5- National Commission of Sustainable Development:
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Location(s):

Countries: Burkina Faso, Ivory Coast,

Activity 626-2014

Research on the implementation of the Treaty's multilateral system of access and benefit sharing for the exchange of germplasm useful to climate change adaptation - Nepal and Bhutan

Status	Complete	Milestone	1.3.3 2015
Start date	2012 Jan	End date	2015 Dec

Description: Work with broad range of partners in Nepal and Bhutan to identify and characterize six reference sites (3 in each country). For each site, assemble data on climate changes in recent years and related cropping stresses. Locate climate analogue sites in other countries. Narrow down suitability of analogous sites with additional research on targetted variables. Work with information/crop specialists to locate germplasm linked to analogue sites or other potentially well adapted germplasm. Seek to obtain adapted germplasm from providers in the analogue countries (or other organizations with collections of such materials) through the multilateral system of access and benefit-sharing, or subject to other laws and policies as may be in place if the materials are not in the MLS. If and when targetted materials are obtained in time in 2013, include them in particpatory evaluation trials. In most cases, trials won't be possible until 2014. Throughout 2013 and 2014, lessons learned from experiences will be documented and used to inform policy development processes related to the implementation of the multilateral system of access and benefit sharing of the International Treaty (and the Convention on Biological Diversity).

Status: Complete. Most work planned for in 2014 is complete. Project activities planned to continue in 2015 under flagship 4, activity 2014-88.

Gender Component: The influence of gender will be one of the variables included in the research on policymaking networks, and on access to genetic resources and related information.

Objectives:

1. Countries implement the International Treaty in ways that support use of crop diversity for climate change adaptation.
2. To test and improve efficacy of combined tools, methods, supportive policies, for national programs and farmers to identify, obtain and use improved germplasm for climate change adaptation.

Deliverables:

Description	Type	Year	Status	Justification
Based on work in previous years, continue to seek/obtain germplasm through the MLS (or default systems) and introduce/evaluate adapted germplasm, informed by climate matching and other germplasm identification methods (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	On going	It took longer than anticipated to train the national teams in the use of the tools to identify potentially adapted materials located within the countries concerned, or internationally. By now, the partners have identified candidate materials – demonstrating the potential value of facilitated access mechanisms – but they have not yet requested or received them.
Document policy and bureaucratic bottlenecks, lessons-learned (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Document policy and bureaucratic bottlenecks, lessons-learned (article)	Peer-reviewed journal articles	2015	Incomplete	
Identify policy options to overcome bottlenecks in the context of ITPGRFA, CBD and Nagoya Protocol implementation, and make technical contributions to national policy making processes (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	

Description	Type	Year	Status	Justification
Germplasm obtained and evaluated (data/report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	On going	It took longer than anticipated to train the national teams in the use of the tools to identify potentially adapted materials located within the countries concerned, or internationally. By now, the partners have identified candidate materials – demonstrating the potential value of facilitated access mechanisms – but they have not yet requested or received them.
Two national-level policies adopted to create legal space and institutional mandates to implement the multilateral system of access and benefit-sharing: National Agricultural Biodiversity Policy and the National Biodiversity Strategy and Action Plan.	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	

Partners:

1- National Biodiversity Centre, Ministry of Agriculture:
Tashi Yangzone <yangzome3@gmail.com>

2- Nepal Agricultural Research Council (NARC):
Madan Bhatta <madan_bhatta86@yahoo.com>

3- Nepal Agricultural Research Council (NARC):
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4- Local Initiatives for Biodiversity Research and Development (LIBIRD):
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Location(s):

Countries: Bhutan, Nepal,

Activity 763-2014

Policies to support crop diversification for climate change adaptation and risk management

Status	Extended	Milestone	2.1.1 2015
Start date	2014 Jan	End date	2015 Dec

Description: Investigation concerning (1) inclusion of crop diversification in NAPs/NAPAs; (2) national government subsidies effecting crop and species portfolio choices by farmers and companies, and their relationship to climate change adaptation planning. In addition, this activity will also include the carry-over activities from the 2013 activity called, "Analysis of changing patterns of PGRFA use to to adapt to climate change, and related policy frameworks" (# 616), and includes deliverable #4.

Status: Extended. The work as planned for in 2014 has been completed. It will continue in 2015 with bridging funds, under flagship 4 Activity 2014-88

Gender Component: Not defined

Objectives:

1. Increased inclusion of crop diversification in national climate change adaptation strategies.
2. National subsidy schemes reflect importance of crop diversification for climate change adaptation.

Deliverables:

Description	Type	Year	Status	Justification
Global survey of NAPs for crop diversification (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Literature survey of public policies creating incentives for farmers to grow particular species or varieties and their relationship to the use of crop diversity (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
At least 2 country case studies	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	

Description	Type	Year	Status	Justification
Finalize analysis based on results from the 2011 survey of CGIAR Centers and the 2013 survey of PGRFA users in 19 countries (data, report(s))	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	On going	Data from 250 respondents from 19 countries assembled and cleaned; summary report of responses completed. Final analysis and write up to be completed in 2015.

Partners:

1- Center for Environmental and Agricultural Policy Research, Extension and Development (CEAPRED):

Deevendra Gauchan <devendragauchan@yahoo.co.uk>

2- Chinese Academy of Tropical Agricultural Sciences (CATAS):

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3- Association of Biotechnology Led Enterprises (ABLE):

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4- Arizona State University (ASU):

Eric Welch <[insert]>

Location(s):

Global

Activity 764-2014

Mainstreaming agricultural biodiversity conservation and utilization in agricultural sector to ensure ecosystem services and reduce vulnerability

Status	On going	Milestone	2.1.1 2015
Start date	2013 Sep	End date	2015 Dec

Description: The project plan to address the various challenges and barriers through strategic interventions at the national, regional and local levels that strengthen on farm maintenance, improve farmer involvement and participation, link conservation and use and contribute to the development of an improved policy framework and capacity. The work will be undertaken in four agro-ecoregions and includes: (i) Western Himalayas including the cold arid tract, (ii) North-eastern region and the Eastern Himalayas, (iii) Western arid/semi-arid region, and (iv) Central tribal region.

Status: On going. Using a PPG grant a Full Size Proposal has been prepared and submitted to UNEP and GEF for approval/clearance. The project will promote crop diversity of 14 crops across 22 sites in India which are spread across four agro-ecological zones of India.

Gender Component: Rural and tribal communities and more broadly the farming community in India will beneficiaries of this project. With the increasing feminization of agriculture and the rise in women headed farm households, women's knowledge of agrobiodiversity and access to this diversity will enable them to effectively use plant genetic resources to stablise and enhance the food availability for the family.

Objectives:

1. Adaptive management of crop diversity for resilient agriculture and improved livelihoods
2. Strategies and policies for sustainable conservation and use of crop diversity including access and benefit sharing
3. Improved agricultural support systems, institutional frameworks and partnerships that support crop diversity on farm

Deliverables:

Description	Type	Year	Status	Justification
Baseline crop diversity assessment (report)	Databases	2014	Complete	
Project design for full funding of GEF proposal (proposal)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2015	Cancelled	

Partners:

1- National Bureau of Plant Genetic Resources (NBPGR):
Dr. K. C. Bansal, <director@nbpgr.ernet.in>

2- Indian Council of Agricultural Research (ICAR):
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3- Protection of Plant Varieties and Farmers' Rights Authority (PPV&FRA):
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4- Action for Social Advancement (ASA):
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5- Ministry of Environment, Forest and Climate Change (MoEFCC):
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6- Gramin Vikas Vigyan Samiti (GRAVIS):
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7- Himalayan Research Group (HRG):
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8- Humana People to People India:
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9- Krishi Vigyan Kendra, Satna (KVK Satna):
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10- Krishi Vigyan Kendra, Narsinghpur (KVK Narsinghpur):
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12- Deendayal Research Institute (DRI):
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13- Mount Valley Development Association (MVDA):
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14- Lok Chetna Manch (LCM):
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Location(s):

Countries: India,

Activity 627-2014

Varietal diversification as a risk management strategy in East Africa

Status	Complete	Milestone	2.1.1 2015
Start date	2012 Jan	End date	2015 Dec

Description: Having diverse crops and varieties potentially forms a natural insurance against climate change risk. Practicing designed diversification strategies can help farmers to add varieties and crops to their mixture to make their varietal portfolio less vulnerable to climate risk hence reduce crop failures and increase yields. This project seeks to produce insights on the potential of varietal diversification strategies in CCAFS benchmark sites, these sites have been chosen since they have diverse climatic and environmental conditions. The project will assess levels of diversity of Sorghum, Cowpea and Pigeon pea crops, assess the current vulnerability of their varieties and varietal portfolios, and identify varietal diversification needs and opportunities in benchmark sites in East Africa. Based on this information, varietal diversification strategies will be designed and tested in the field, introducing existing landrace and improved materials to farmers. The project is framed upon the assumption that increased diversity will reduce the vulnerability of farmers.

Status: Complete. The activity has been completed.
Practicing designed diversification strategies can help farmers to add varieties and crops to their mixture to make their varietal portfolio less vulnerable to climate risk hence reduce crop failures and increase yields. The aim of the project was to provide insights on the potential of varietal diversification strategies in CCAFS benchmark sites i.e. Kenya (Nyando and Wote) and Tanzania (Hombolo) to help farmers to adapt to climate change. These sites were chosen since they have diverse climatic and environmental conditions. The project was based on the assumption that increased diversity will reduce the vulnerability of farmers. To achieve its objectives, the project conducted household surveys and Focus Group Discussions in Makueni, Nyando and Hombolo to assess the levels of diversity of sorghum, cowpea and pigeon pea crops; assess current vulnerability of farmers' varieties and varietal portfolios, and identify varietal diversification needs and opportunities in benchmark sites in East Africa. The diversification strategies for farmer varieties of target crops were designed and tested by conducting on-station trials in Kenya (Katumani) and Tanzania (Hombolo, Arusha and Morogoro) and on-farm trials in Kenya (Makueni and Kisumu) and Tanzania (Hombolo) to allow for comparisons of crop performance between sites i.e. what works where and why and with other intervention strategies. The 114 varieties tested in the field were obtained from the National Gene Bank of Kenya (NGBK) and the National Plant Genetic Resources Centre of Tanzania (NPGRC). Applying the approach made it possible to compare the impact and determine advantages and disadvantages of varietal diversification relative to alternative technologies and interventions. This introduced existing landrace and improved materials to farmers. Moreover, 1300 farmers were supplied with at least four different varieties of sorghum through crowd sourcing. Farmer field days were held in Nyando, Makueni and Hombolo. They were attended by numerous

farmers who expressed an interest in acquiring a number of the sorghum varieties. In addition, the project has build capacity by training partners in the collaborating institutions on GIS and climate change modeling as well as training of 5 Master students.

Gender Component: We use data from household surveys based on interviews from male and female farmers of different age groups, creates understanding on how gender disparities affect the ways in which male and female farmers access planting materials. Integrating gender into our research allows us to address the gendered constraints and improve male and female farmers' ability to sustain food production in the context of changing climatic conditions through the increased use of plant genetic resources

Objectives:

1. To review the effectiveness of biotic diversification by smallholder farmers as a strategy to manage climate risk.

Deliverables:

Description	Type	Year	Status	Justification
Model of sorghum, pigeon pea and cowpea for adaptation to climate change in different environments (report)	Peer-reviewed journal articles	2014	Complete	
Socio-economic data completed in 2 countries (report)	Data	2014	Complete	
Farmers criteria for choosing crops and varieties understood and documented	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	Data are still under analysis. We need to make a summary from all

Description	Type	Year	Status	Justification
The working paper presents a new toolkit for the implementation of a participatory vulnerability assessment (PVA) in rural localities, by introducing the methodology, as well as the findings, from a pilot study in Sokoine (Zepisa, Hombolo Ward) in Tanzania. It is based on a participatory methodological approach and follows a multidimensional conceptualisation of social vulnerability to climate change."The methodology is designed to equip project implementers who have limited resources to assess the occurrence and consequences of climate impacts on local livelihood strategies and food systems. It will assist them in understanding local views on how climate change may affect them, what kind of coping strategies are already in place and how their adaptive capacity can be enhanced through measures that are tailored to the profiles of different local groups. "	Working Paper	2014	Complete	

Partners:

1- African Biodiversity Conservation and Innovations Centre (ABCIC):
Dan Kiambi <d.kiambi@abcic.org>

Location(s):

Benchmark Site: Nyando (Katuk Odeyo), Makueni (Wote),

Regions: East Africa (EA),

Activity 766-2014

Crop and livelihood diversification for household and community resilience

Status	On going	Milestone	2.1.3 2015
Start date	2014 Jan	End date	2015 Dec

Description: Diversification is a promising management adaptation measure under increased climate uncertainty. Crop and tree species diversification is a potentially interesting measure because it has multiple benefits for both individual farmers and food systems. Yet, smallholders may have several reasons to not diversify their systems..To improve diversification recommendations, they should better take into account farmers´ interests and incentives. Additionally, they should include input from different stakeholders that influence farmers´ decisions. This activity proposes to develop a participatory method that helps rural communities in making diversification strategies for climate change adaptation with relevant stakeholders. This should be supported with science-based information on different aspects that are important for smallholders in determining diversification strategies.

Status: On going. Decision support tools:
We carried out participatory vulnerability evaluations to establish a dialogue with coffee and cereal farmer families in coffee landscapes about their needs, possible adaptation options, and the role of diversification in climate smart agriculture (CSA). We focused on ten communities in two municipalities representing the humid and dry coffee zone in Nicaragua.
The evaluations were carried out in collaboration with the second-level coffee cooperative PROODECOP and the Unión Nacional de Agricultores y Ganaderos de Nicaragua (UNAG). Four agronomy students from the Matagalpa dépendance of the Universidad Nacional Autonoma de Nicaragua (UNAN –Matagalpa) did their theses as part of the evaluations in San Ramon.
The resulting evaluation reports provide concrete CSA recommendations for the technicians of UNAG and PROODECOOP as well as for local policy makes and NGO. They will be the basis for a local discussion forum in Matagalpa, February 2015, and fenological calendars of coffee and cereal production, which will be delivered in poster format to each participating community.

Strategy for the development of a methodology for ex ante evaluation of interventions:
Bioversity, the World Agroforestry Centre (ICRAF) and International Development Studies (IDS) organized a workshop to train personal from PROODECOP and other local organizations to carry out vulnerability evaluations themselves. We expect that this activity will encourage these organizations to establish further farmer dialogues on climate smart agriculture.

Paper on conceptual framework of crop diversification as climate change risk management strategy:
A review on crop diversification for climate change risk management in agriculture systems is planned to be submitted in June 2015 to the Journal of Sustainable Development.

Planning workshop CCAFS 1.2 Central American coffee landscape project:
A planning workshop was organized in November 2014 in Huehuetenango Guatemala to develop a project work plan and validate the theory of change of this project by representatives of two coffee cooperatives, PROODECOP and ASOBAGRI, and the Guatemalan export organization AgExport.

Site-specific decision-support tool for crop diversification options:
In collaboration with ICRAF, databases are developed to carry out ensemble modelling under current and future climate conditions to identify suitable fruit and timber tree species for diversification of Central American coffee landscapes. This activity is ongoing.

The effect of crop diversification on national agricultural income returns:
We developed a dynamic motion chart that presents for 111 countries the relationship between crop portfolios between 1991 and 2011 (21 years) and income and production stability following FAOSTAT.

Gender Component: The research on diversification to sustain agriculture systemsunder changing climate conditions will take into account constraints and opportunities for different members of farmer families.

Objectives:

1. Development of a participatory approach and a dynamic information system that helps rural communities in making diversification strategies for climate change adaptation with relevant stakeholders
2. Understanding climate risk strategies of small-scale farmers with a focus on crop and household diversification
3. Understanding to which extent farmer families are interested to make their systems more sustainable to climate risks and which constraints limit them from doing so

Deliverables:

Description	Type	Year	Status	Justification
Peer-reviewed paper submitted on conceptual framework around crop and tree species diversification as risk management strategy for smallholders to climate change (article)	Peer-reviewed journal articles	2014	On going	The manuscript is not ready for submission. More time was required to define the specific objectives for a review on crop diversification for climate change risk management. An additional work was started in Nicaragua to recolect field data on crop diversification.
Site-specific decision-support tool for crop diversification options developed (prototype software)	Platforms - Data Portals for disseminati on	2014	On going	A new activity, the organization of the CCAFS 1.2 coffee landscape planning workshop was prioritized over this activity.
Decision-support tool tested in workshops with local actors in two different agroecological sites (report)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Strategy for the development of a methodology for ex ante evaluation of interventions regarding rural household resilience in the face of weather and price shocks (workshop report, jointly with other centres and IRI)	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
The effect of crop diversification on national agricultural income returns	Data	2014	Complete	

Description	Type	Year	Status	Justification
Planning workshop CCAFS 1.2 Central American coffee landscape project	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	

Partners:

1- World Agroforestry Centre (ICRAF):
Jenny Ordonez <j.ordonez@cgiar.org>

2- Centre International de Recherche Agricole et du Developpppement (CIRAD):
Abigail Fallot <fallot@cirad.fr>

Location(s):

Countries: Nicaragua,

Activity 629-2014

Local climate change vulnerability assessment and adaptation planning

Status	Complete	Milestone	4.2.1 2014 (3)
Start date	2013 Jan	End date	2014 Dec

Description: Many climate adaptation decisions are taken at a local level. Therefore, it is important to understand climate vulnerability in the target sites to target CCAFS research and to inform local decision-making. In this activity we review different existing vulnerability toolkits, adapting and testing a toolkit for use in CCAFS.

Status: Complete. Three working papers and an article have been produced but still need to be published. This activity has been completed.

Gender Component: This activity is about qualitative analysis of climate vulnerability at the community level. The tools contain specific methodological guidelines on how to take the gender dimension into account. This includes working with separate groups for men and women.

Objectives:

1. Refined generic methodology for local climate vulnerability assessment

Deliverables:

Description	Type	Year	Status	Justification
Methodology refined and applied in at least 2 more sites (report)	Peer-reviewed journal articles	2014	Complete	
Draft manual developed (manual)	Peer-reviewed journal articles	2014	Complete	
Paper submitted to international journal for peer review (article)	Peer-reviewed journal articles	2014	Complete	

Partners:

1- Institute of Development Studies (IDS):
Terry Cannon <t.cannon@ids.ac.uk>

Location(s):

Countries: India, Nicaragua,

Activity 1023-2014

Continue financial support to crowdsourcing project with Bioversity

Status	On going	Milestone	1.1.1 2014
Start date	Not defined	End date	Not defined

Description:

Status: On going. We have engaged with DIGESA, the NARS in Honduras, to inform members of the variety release committee and other researchers about the methodology. We have presented the methodology in a large event organized by DIGESA. Trial results will be available in February 2015, when the bean harvest will have taken place. Based on this, a variety will be submitted for release.

Gender Component: We collect gender-disaggregated data on variety preference.

Objectives:

Objectives not defined

Deliverables:

Description	Type	Year	Status	Justification
Meeting with national variety release committee of Honduras to provide information about the crowdsourcing crop improvement methodology.	Workshop	2014	On going	We met with one representative of the committee. The full meeting will held when the data are available, in the first half of 2015.
Document supporting the suitability of a local bean variety for release based on crowdsourced variety evaluation.	Peer-reviewed journal articles	2015	Incomplete	

Partners:

1- Escuela Agricola Panamericana Zamorano:
JC Rosas <jcrosas@zamorano.edu>

Location(s):

Not defined

2. Succinct summary of activities and deliverables by Output level.

Output: 1.1.1

Summary: In 2014, Bioversity´s contribution to CCAFS on "Seeds for Needs" made progress in further refining tools that underpin a crowdsourcing approach, designed to reach large number of farmers with varietal diversity and information for climate adaptation. We further tested the approach now reaching several thousands of farmers on three continents. We gained a number of methodological insights and made improvements that bring the crowdsourcing methodology after 1.5 years to a level in which it can be used to upscale systematically to include >10,000 farmers in trials and integrate weather data into variety evaluation under farmer conditions.

Output: 1.1.3

Summary: Bioversity has continued to give support to implement data standardization in AgTrials, a large database with CGIAR trial data maintained by CCAFS/CIAT. At the same time, we have developed new training modules on the management of genetic and species diversity, building on experiences under other activities (crowdsourcing, community seed banks, crop adaptation modelling), which will be launched in 2015. Bioversity continued the execution of a large IFAD grant on the use of traditional crops for climate adaptation. Through a survey, insights were gained on the traits that farmers are after when they plant these crops, focusing specifically on climate-related traits. Bioversity published the Accra Statement, resulting from the 3rd International Conference on Neglected and underutilized species (NUS) which underlines the importance of traditional crops for climate resilience. This work forms the backdrop to a major outcome reported this year by Bioversity: India´s Food Security Bill will diversify the sourcing of grains, including millets and other crops.

Output: 1.2.1

Summary: Bioversity activities in contribution to output 1.2.1 in 2014 focused on banana, cocoa and coconut as well as associated leguminous shade trees where both banana and cocoa are commonly found in mixed multi-strata systems. A simple banana model based on leaf emission was culminated and written up in a chapter for an FAO publication on the effects of climate change on global commodities. The ground work was also completed to test similar approaches with coconut and cocoa which have different growth patterns than banana. The effects of climate change on suitability of leguminous shade trees was addressed with ecological niche modelling, a tool less applicable to a crop such as banana. Preliminary results showed that farmers in current coffee growing areas will have fewer shade tree options with climate change which may challenge the idea that climate change adaptation may be addressed with agroforestry management. The basis for expert consultations was set up for a better understanding of the impact of moderate and extreme weather events on crop performance. A framework will be developed to match management practices with types of weather events by which banana sectors from across the globe can share and borrow experiences from similar zones on other continents. Finally, stakeholder dialogues at the national level are targeted to bring this set of tools together in sector adaptation planning. The major question being addressed is how a

commodity sector can provide a clear case to incorporate their interests into national adaptation planning. Although additional funding was sought through the open call for proposals to continue this work beyond 2014, we were only successful in attracting a one-year bridge fund grant. Efforts are underway to integrate this work into Humidtropics, RTB and another Bioversity led grant on multi-strata systems.

Output: 1.3.2

Summary: In 2014, we completed a global review of the literature on community seed banks and finalized the write up of more than 40 detailed case studies from around the world. Findings indicate that in recent years promising policy changes have been taking place in a number of countries in support of community seed banks and their roles in adapting to climate change. Nepal's government pioneered a Community Seed Bank Guideline (2009). Bioversity has supported government and non-government agencies to guide the planning, implementation and regular monitoring of community seed bank activities. In 2014, Bhutan's National Biodiversity Centre (NBC) followed Nepal's example by preparing a guide for community seed banks with technical inputs from Bioversity. In Central America, the 'Strategic Action Plan for Strengthening the Role of Mesoamerican Plant Genetic Resources for Food and Agriculture in Adapting Agricultural Systems to Climate Change,' approved in 2014 by the ministers of agriculture of six countries, makes community seed banks central. This positive trend will likely continue and expand, given the potential of community seed banks as well as increasing awareness of this potential among key decision-makers and their interest in integrating community seed banks into the broader framework of policies, strategies and programs.

Output: 1.3.3

Summary: In 2014, Bioversity continued to work with national government and non-government partners in Burkina Faso, Bhutan, Costa Rica, Cote d'Ivoire, Guatemala, Nepal, Rwanda, and Uganda to strengthen national capacities to implement the International Treaty on Plant Genetic Resources for Food and Agriculture. More than 100 government officials, public sector researchers, university professors and technical staff of non-government organizations were trained in the use of geo-spatial tools and data to design new strategies to identify, access and evaluate potentially adapted germplasm for future climate scenarios. Also in Uganda, an interministerial policy across three ministries has been proposed to allocated mandates for mutually supportive implementation of the Nagoya Protocol and the ITPGRFA. Project partners have drafted a draft MoU among all the relevant competent authorities and proposed executing agencies. In Nepal, policies have been adopted to create a legal space for implementation of the multilateral system of access and benefit-sharing: the National Agricultural Biodiversity Policy and the National Biodiversity Strategy and Action Plan (NBSAP). (See outcome story for more details).

Output: 2.1.1

Summary: A review was done of how crop diversification, comprising of a number of risk management strategies that is almost never missing from policy documents, was reflected in national policies, including a worldwide analysis of NAPs (published as a CCAFS working paper) and policies of selected countries in Africa and Asia. These results will feed into policy processes, specifically the

development of guidelines by the Commission on Plant Genetic Resources for Food Agriculture (FAO). Also, we concluded an activity that investigated the potential for genetic diversity to help to manage risk, focusing on 1300 farmers in the CCAFS Climate Smart Villages in East Africa. The results from this activity will become available in 2015.

Output: 2.1.3

Summary: In 2014, work in Nicaragua was begun that will continue in 2015 under Flagship 1.2. The main challenge this work addresses is to design rational diversification strategies within climate-smart agriculture, taking Central American coffee landscapes as the main case. This involves methodological development coupled with careful local testing of methodologies. Participatory vulnerability evaluations were carried out in ten different communities in collaboration with farmer organizations and a local university, who were trained in using the IDS-Bioversity participatory vulnerability assessment toolkit, which has been applied in other contexts in 2014 as well, contributing to a global learning process. On the basis of these vulnerability assessments, local diversification strategies will be designed. We have made progress on developing a conceptually-sound CSA diversification planning tool that has been validated in practice to help local communities select appropriate crops and practices. The tool is now being validated and will be published in 2015. It will be used widely in Nicaragua and Guatemala within CCAFS work. Overall, 2014 outputs lay a solid basis for the development of solid diversification strategies in coffee landscapes in activities that will be executed in 2015.

Output: 4.2.1

Summary: In 2014, we have finished the IDS-Bioversity toolkit, culminating in the readying of three working papers (some of them already online, others will follow in the next few weeks) and a manuscript for a peer-reviewed paper in collaboration with highly regarded vulnerability experts at IDS. We have used the toolkit to train teams in Asia, Africa, and Latin America in using the methodology and have systematically processed the lessons learned to improve the toolkit. We plan to use this toolkit along with other tools to make consistent local assessments of vulnerability, taking into account root causes of vulnerability (and not just symptoms or biophysical aspects) and to fully account for gender and social differentiation.

3. Communications.

Media Campaigns:

Feb 2, 2014 Climate Change Cuisine: It's What's for Dinner
http://www.climatecentral.org/news/climate-change-cuisine-its-whats-for-dinner-17020

Feb 19, 2014 Promotion of partner mention in the guardian on Ethiopia seedbank
http://www.theguardian.com/global-development/2014/feb/19/ethiopia-seed-bank-preserving-diversity-under-threat-g8-new-alliance

Mar 6, 2014 Los agricultores custodios y los bancos comunitarios de semilla
http://www.agriculturesnetwork.org/magazines/latin-america/biodiversidad/bancos-comunitarios-de-semilla

May 30, 2014 Superalimento andino foi preterido na loucura pela quinoa
http://exame.abril.com.br/economia/noticias/superalimento-andino-foi-preterido-na-loucura-pela-quinoa

Jun 8, 2014 What's the Next Quinoa? Farmers, Foodies Revive Heritage Grains
http://news.nationalgeographic.com/news/2014/07/140708-ancient-grains-quinoa-fonio-food-africa/

Sep 11,2014 New Research Project: Food Security and Climate-Resilient Agriculture
http://gsnetworks.org/blog/new-research-project-climate-resilient-agriculture-and-food-security/

Oct 9, 2014 Family Farmers Don't Need Climate-Smart Agriculture
http://www.ipsnews.net/2014/10/family-farmers-dont-need-climate-smart-agriculture/

Oct 10, 2014 Un quarto dell'alimentazione mondiale si basa su 12 specie agricole
http://gds.it/2014/10/10/lesperto-un-quarto-dellalimentazione-mondiale-si-basa-su-12-specie-agricole_244464/

Oct 15, 2014 Seedversity, ecco come nascono i semi che sfamano il mondo
http://www.wired.it/attualita/ambiente/2014/10/15/seedversity/

Oct 15, 2014 Seedversity, viaggio nella biodiversita (web documentary)
http://www.wired.it/partner/seedversity/#Etiopia

Blogs:

Aug 6, 2014 Closing the weather data gap with iButtons
http://www.bioversityinternational.org/news/detail/closing-the-weather-data-gap-with-ibuttons/

Aug 6, 2014 Giving farmers choices: Seeds for Needs
http://www.bioversityinternational.org/news/detail/giving-farmers-choices-seeds-for-needs/

Aug 12, 2014 Testing sorghum and cowpea varieties to increase farmers' production margins in East Africa
http://ccafs.cgiar.org/blog/testing-sorghum-and-cowpea-varieties-increase-farmers%E2%80%99-production-margins-east-africa#.VNiQWLDF9WQ

Aug 18, 2014 Supporting international cooperation in access and benefit sharing of germplasm for climate change adaptation
http://www.bioversityinternational.org/news/detail/supporting-international-cooperation-in-access-and-benefit-sharing-of-germplasm-for-climate-change-a/

Aug 22, 2014 Custodian farmers: The go-to people for agricultural biodiversity
http://www.bioversityinternational.org/news/detail/custodian-farmers-the-go-to-people-for-agricultural-biodiversity/

Sep 2, 2014 Harmonizing crop trait data: Crop Ontology
http://www.bioversityinternational.org/news/detail/harmonizing-crop-trait-data-crop-ontology/

Sep 8, 2014 Agricultural biodiversity: a cornerstone for family farm adaptation to climate change
http://www.bioversityinternational.org/news/detail/agricultural-biodiversity-a-cornerstone-for-family-farm-adaptation-to-climate-change/

Sep 25, 2014 The International Plant Treaty at the centre of climate change discussions
http://www.bioversityinternational.org/news/detail/the-international-plant-treaty-at-the-centre-of-climate-change-discussions/

Oct 9, 2014 How much local is local? Working with Ethiopian farmers to adapt to climate change
http://dialogues.cgiar.org/blog/working-with-ethiopian-farmers-to-adapt-to-climate-change/

Oct 15, 2014 Seeds for Needs – Papua New Guinea
http://www.bioversityinternational.org/news/detail/seeds-for-needs-papua-new-guinea-1/

Oct 15, 2014 Why smart farmers are diversifying
http://dialogues.cgiar.org/blog/why-smart-farmers-are-diversifying/

Oct 16, 2014 Celebrating World Food Day with family farmers in Ethiopia
http://www.bioversityinternational.org/news/detail/celebrating-world-food-day-with-family-farmers-in-ethiopia/

Oct 20, 2014 Crop diversification strategies for Cambodia, Laos and Vietnam
http://www.bioversityinternational.org/news/detail/crop-diversification-strategies-for-cambodia-laos-and-vietnam/

Nov 4, 2014 Bioversity International's scientific facts and blogs reap awards in CGIAR Development Dialogues competitions
http://www.bioversityinternational.org/news/detail/bioversity-internationals-scientific-facts-and-blogs-reap-awards-in-cgiar-development-dialogues-com/

Nov 7, 2014 Crop diversification strategies for Cambodia, Laos and Vietnam (Crosspost)
http://ccafs.cgiar.org/blog/crop-diversification-strategies-cambodia-laos-and-vietnam#.VNiQVrDF9WQ

Nov 13, 2014 Making genebanks 'climate-ready' to meet challenges of the future
http://ccafs.cgiar.org/blog/making-genebanks-climate-ready-meet-challenges-future#.VNiQTrDF9WQ

Nov 17, 2014 How much local is local? Working with Ethiopian farmers to adapt to climate change (Cross-post from DD)
http://ccafs.cgiar.org/blog/how-much-local-local-working-ethiopian-farmers-adapt-climate-change#.VNiQU7DF9WQ

Dec 9, 2014 Small countries, big hopes
http://ccafs.cgiar.org/blog/small-countries-big-hopes#.VNiQS7DF9WQ

Dec 10, 2014 USAID partners with Bioversity International on Crowdsourced Crop Improvement
http://www.bioversityinternational.org/news/detail/usaid-partners-with-bioversity-international-on-crowdsourced-crop-improvement/

Dec 12, 2014 Positioning genetic resources for food and agriculture in the climate change agenda
http://ccafs.cgiar.org/blog/positioning-genetic-resources-food-and-agriculture-climate-change-agenda#.VNiQSbDF9WQ

Dec 22, 2014 Supporting international efforts to pool and conserve crop genetic resources in times of radical legal change
http://www.bioversityinternational.org/news/detail/supporting-international-efforts-to-pool-and-conserve-crop-genetic-resources-in-times-of-radical-leg/

Websites:
Mar 15, 2014 Seeds for Needs web page update
http://www.bioversityinternational.org/research-portfolio/adaptation-to-climate-change/seeds-for-needs/

May 15, 2014 Adaptation to Climate change web page update
http://www.bioversityinternational.org/research-portfolio/adaptation-to-climate-change/

Continuous NUS Community website and social media (twitter, Flickr etc)
http://www.nuscommunity.org/

Social Media Campaigns:

Feb 2, 2014 Climate Change Cuisine: It's What's for Dinner
http://www.climatecentral.org/news/climate-change-cuisine-its-whats-for-dinner-17020

Feb 19, 2014 Promotion of partner mention in the guardian on Ethiopia seedbank
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Mar 6, 2014 Los agricultores custodios y los bancos comunitarios de semilla
http://www.agriculturesnetwork.org/magazines/latin-america/biodiversidad/bancos-comunitarios-de-semilla

May 30, 2014 Superalimento andino foi preterido na loucura pela quinoa
http://exame.abril.com.br/economia/noticias/superalimento-andino-foi-preterido-na-loucura-pela-quinoa

Jun 8, 2014 What's the Next Quinoa? Farmers, Foodies Revive Heritage Grains
http://news.nationalgeographic.com/news/2014/07/140708-ancient-grains-quinoa-fonio-food-africa/

Sep 11,2014 New Research Project: Food Security and Climate-Resilient Agriculture
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Oct 9, 2014 Family Farmers Don't Need Climate-Smart Agriculture
http://www.ipsnews.net/2014/10/family-farmers-dont-need-climate-smart-agriculture/

Oct 10, 2014 Un quarto dell'alimentazione mondiale si basa su 12 specie agricole
http://gds.it/2014/10/10/lesperto-un-quarto-dellalimentazione-mondiale-si-basa-su-12-specie-agricole_244464/

Oct 15, 2014 Seedversity, ecco come nascono i semi che sfamano il mondo
http://www.wired.it/attualita/ambiente/2014/10/15/seedversity/

Oct 15, 2014 Seedversity, viaggio nella biodiversita (web documentary)
http://www.wired.it/partner/seedversity/#Etiopia

Newsletters:

N/A

Events:

Mar 20, 2014 Taller: Diseño de simulacros para la atención a eventos climáticos con impacto en el sector agroalimentario
http://ccafs.cgiar.org/es/taller-dise%C3%B1o-de-simulacros-para-la-atenci%C3%B3n-eventos-clim%C3%A1ticos-con-impacto-en-el-sector#.VNiQZbDF9WQ

Apr 30, 2014 Action plan promotes neglected and underutilized species as strategic assets for food security
http://www.bioversityinternational.org/news/detail/action-plan-promotes-neglected-and-underutilized-species-as-strategic-assets-for-food-security/

Sep 16, 2014 Submit proposals to be part of EXPO Sustainable Best Practices exhibition

Videos and other Multimedia:

N/A

Other Communications and Outreach:

Jan - 2014
Seeds for Needs: adaptation to climate change
http://www.bioversityinternational.org/e-library/publications/detail/seeds-for-needs-adaptation-to-climate-change/

Jan - 2014 Seeds for Needs: atlas of crop suitability
http://www.bioversityinternational.org/e-library/publications/detail/seeds-for-needs-atlas-of-crop-suitability/

Jan - 2014 Seeds for Needs: participatory variety selection
http://www.bioversityinternational.org/e-library/publications/detail/seeds-for-needs-participatory-variety-selection/

Jan - 2014 Seeds for Needs: perceptions on climate change
http://www.bioversityinternational.org/e-library/publications/detail/seeds-for-needs-perceptions-on-climate-change/

Jan 15, 2014 Seeds for Needs in East Africa
http://www.bioversityinternational.org/e-library/publications/detail/seeds-for-needs-in-east-africa/

Apr 15, 2014 A crowdsourcing approach to detect farmers' preferences
http://www.bioversityinternational.org/e-library/publications/detail/a-crowdsourcing-approach-to-detect-farmers-preferences/

Jun 10, 2014 Matching Seeds to Needs — female farmers adapt to a changing climate in Ethiopia
http://www.bioversityinternational.org/e-library/publications/detail/matching-seeds-to-needs-female-farmers-adapt-to-a-changing-climate-in-ethiopia/

Aug 6, 2014 Bioversity International annual report 2013 - several CCAFS stories
http://www.bioversityinternational.org/AR13/

Aug 15, 2014 Update Seeds for Needs flyer for donors

Sep 20, 2014 Factsheets on work in Ethiopia for Board of Trustees

Sep 25, 2014 Impact Pathway Infographic for CCAFS meeting

Oct 15, 2014 Seeds for Needs – Papua New Guinea - booklet

4. Case studies.

Case Study #1

Title: Building capacity to understand climate change issues and their impact on agricultural biodiversity

Author: Margarita Baena, Bioversity International

Type: Capacity enhancement;

Project Description:

Universidad Nacional de Colombia (UNAL, Palmira Campus) and CCAFS, through CIAT and Bioversity International, are jointly training university students to work with communities in assessing their vulnerability to climate change and in developing adaptation measures. Young professionals in agriculture and environmental sciences at UNAL are learning to deal with climate change in all its complexity, by exploring its causes, consequences and impact, as well as by working with communities in finding options to mitigate and adapt to climate changes. Instruction is combined with practical work in simulations and with thesis research.

Introduction / objectives:

Climate change is already affecting people's lives. Investing in preparation to understand it and deal with it effectively is crucial for society. As universities are expected to prepare leaders and decision makers, mainstreaming climate change topics in the curricula and research of universities is, therefore, necessary. Working collaboratively with universities is an opportunity for CGIAR centers working with CCAFS to share knowledge and build local capacity.

Project Results:

Academic instruction: A course was delivered for the first time in 2014 entitled, Climate change and agricultural biodiversity, studying what is climate change, how it affects society (particularly agricultural biodiversity and livelihoods), which models can be used to predict changes and vulnerability, and how adaptation strategies involving affected communities can be developed. The course was offered as an elective to graduate and undergraduate students enrolled at the agricultural and environmental science programs at UNAL's Palmira campus. Course content was introduced by a group of CCAFS professionals from CIAT and Bioversity, under the general orientation and supervision of Prof. Carlos Iván Cardozo, UNAL's Director of Graduate Studies.

Seventy students enrolled in the course in 2014. Students were highly motivated and in their opinion, classes became a forum to discuss issues and this encouraged them to increase their knowledge and understanding, and to develop their thesis or graduation projects on climate change topics. Other students were motivated by experimenting with simulation models and real life cases.. The satisfaction with the course translated into recommendations and the decision by UNAL's academic directors to continue offering the course on a regular basis.

Thesis research: Academic instruction on climate change has been combined with thesis research. Two MSc students from UNAL have done their thesis work on projects associated with CCAFS work

on climate change: one on seed systems in Latin America and one on assessing vulnerability in three agricultural communities of Colombia and using crowdsourcing to select bean varieties tolerant to drought. Thesis supervision is shared between CCAFS researchers and the university faculty. In 2015, Prof. Carlos Iván Cardozo will invite UNAL's professors and students involved in climate change projects to form a community of practice to share knowledge, discuss issues and formulate new research projects, in collaboration with CCAFS specialists.

Partners:

Universidad Nacional de Colombia, Bioversity International, CIAT

Links / sources for further information:

Course description (in Spanish): http://sia.palmira.unal.edu.co/buscador/service/asignaturaInfo.pub?plan=&cod_asignatura=5008601

Case Study #2

Title: Building a Custodian Farmer Network in Nepal: Exchange of Seed and Experiential Knowledge to Enhance Adaptability and Resilience of Agriculture

Author: Gennifer Meldrum, Stefano Padulosi, Sajal Sthapit

Type: Policy engagement;

Project Description:

Adapting farm systems to climate change in Nepal is critical as around 80% of the country's population is dependent on agriculture. Farms in Nepal are effectively all smallholdings and involve complex integration of numerous crop species and varieties with trees and livestock to mitigate risk and meet household needs. The UN Food and Agriculture Organization recommended that agricultural biodiversity, which underpins the resilience and adaptability of farming systems, be incorporated in Nepal´s climate policy including action to promote farmer-to-farmer networks to facilitate exchange of knowledge and adapted crop material (Regmi and Paudyal 2009). This recommendation was considered in the formation of Nepal's National Adaptation Programme of Action (Ministry of Environment 2010), which identifies livelihood diversification and introduction of hardy crops as priority actions that are to be supported by sustainable community-based management of agricultural biodiversity. Climate adaptation in Nepal thus effectively intersects with the aims of the National Agrobiodiversity Conservation Policy (2007) to sustainably use and conserve crop genetic resources for greater food security.

One challenge to making agricultural biodiversity management relevant as a climate adaptation

strategy for smallholders is a relative disconnect between national institutions and local farming realities. This has been noted by partners in a project on neglected and underutilized species (NUS) funded by the International Fund for Agricultural Development (IFAD) and the project has developed experiences around 'custodian farmers' that may help bridge this gap. Agricultural biodiversity is maintained and created through farmer seed selection and exchange processes in which some individuals play a more prominent role, acting as nodal points in farmer networks or maintaining higher levels of diversity compared to others in their communities. The project has been investigating methods to leverage and strengthen the contribution of these 'custodian farmers' to the maintenance, adaptation and dissemination of crop genetic diversity for greater resilience.

Introduction / objectives:

A major aspect of the work has involved identifying custodian farmers and linking them in a national network, which enables the flow of crop materials and experiential knowledge on how the materials fit in rapidly changing agro-ecosystems. A workshop entitled 'Enhancing the contribution of custodian farmers to the national plant genetic resource system in Nepal' was held in Pokhara from 30 July to 1 August 2013 that brought together custodian farmers with policymakers and researchers to define methods, tools and policy options to strengthen the maintenance, adaptation and dissemination of agricultural biodiversity in Nepal for greater resilience.

Project Results:

A seed exchange, discussion groups, and presentations allowed for translation and digestion of content in various ways to encourage understanding between the different groups. Group discussions identified viable approaches to strengthen the contribution of custodian farmers to maintaining, adapting and disseminating crop diversity. By including government officials directly in the discussions, the resulting recommendations had immediate traction and indeed many have already been followed through since the meeting was held last summer. Many of the action points concerned how to develop links between on-farm and ex situ conservation. For example, it was proposed that custodian farmers could contribute their seeds to the national genebank and they could also access materials from the collection, which may have useful traits for coping with climate change. Following the meeting, the national genebank independently organized collections from the custodian farmers and arranged for several of the farmers to visit the facility for a training session on seed conservation. The seeds in the genebank are available to farmers on request and the facility is working to increase awareness of this policy. Continuing to develop the custodian farmer network was also discussed as an important action area. The network is currently coordinated by LI-BIRD and NABIC-Nepal but it was suggested that the national system could have a greater role in coordination to reach a larger number of farmers and strengthen its integration with other agrobiodiversity management initiatives. A total of 141 seed samples changed hands during the seed exchange at the meeting. Since the custodian farmers came from distant parts of Nepal and are all active in sharing seeds and knowledge with their communities, this type of networking can have a far reaching effect for communities' access to adapted crop materials.

Partners:

Local Initiatives for Biodiversity Research and Development (LI-BIRD), Network for Agricultural Biodiversity Conservation in Nepal (NABIC-Nepal), International Fund for Agricultural Development (IFAD), Bioversity International, CCAFS.

Links / sources for further information:

Ministry of Environment. 2010. Government of Nepal National Adaptation Programme of Action to Climate Change. Kathmandu, Nepal.

Regmi, B and Paudyal, A. 2009. Climate Change and Agrobiodiversity in Nepal: Opportunities to include agrobiodiversity maintenance to support Nepal's National Adaptation Programme of Action (NAPA) (Bordoni, P,Ed.). LI-BIRD, PAR, FAO and Bioversity International.

Sthapit, S., Meldrum, G., Padulosi, S. and Bergamini, N. (Eds.) 2015. Towards linking in situ and ex situ conservation: enhancing the contribution of custodian farmers to the National plant genetic resources system in Nepal. Proceedings from the National Workshop 31 July to 2 August 2013, Pokhara, Nepal. Bioversity International, Rome, Italy and LI-BIRD, Pokhara, Nepal.

Case Study #3

Title: Participatory vulnerability analysis – testing a new toolkit in Colombia

Author: Marcela Beltran, Jacob van Etten

Type: Social differentiation and gender;

Project Description:

Most efforts to help countries adapt to climate change have focused on top-down approaches, from the global down to the local level, based on climate change scenarios derived from global models (Wildbanks and Kates 1999). Climate impacts, however, are area-specific, so to generate successful climate change-adaptation strategies, local perspectives must be considered in any adaptation intervention. These down-top approaches should be participatory, building on the knowledge, needs and capacities of locals i.e. community-based. Moreover, they should promote equal participation of women, men and disadvantaged or marginalized persons and groups, which are the most vulnerable to climate change-driven impacts (Reid et al. 2009).

Bioversity international and the Institute for Development Studies (UK) designed a toolkit to support the implementation of a participatory vulnerability analysis to climate change, to gather the key data needed to develop adaptation plans targeting men, woman and the most vulnerable groups at a local level (Ulrichs et al. .2015). The toolkit is composed of several participatory methodologies that collect information about social and ecological characteristics, daily impacts of climate change, indicators of wellbeing and food security, livelihood strategies, and changes in farm practices. This study aims to test whether this toolkit fully captures all of the information relevant to establish a climate change adaptation plan with a gender perception. Thus, we can compare the results obtained using the toolkit

with the CCAFS household level survey designed to gather baseline information to characterize rural families. Both methods have been tested in a rural community located in the Chicamocha canyon, in the Colombian Andes.

Introduction / objectives:

Climate change adaptation strategies will only be successful if supported by the stakeholders and local communities who will implement them. Thus, participatory planning tools have been developed to allow communities to be involved in decision-making processes, share their valuable knowledge and solutions to climate change and understand gender views. However, little is known about whether they capture all the information necessary to establish functional climate change adaptation plans. This study tested whether the toolkit designed captures the relevant information with a gender perspective. It compares the information obtained by the toolkit with the information gained by structured household surveys.

Project Results:

The toolkit allowed us to compile valuable gender-disaggregated information from men and women, to generate locally relevant adaptation strategies to climate change in a rural community located in the Chicamocha canyon (Colombia). Men and women in the community agreed that water scarcity was the main issue that affected the livelihood strategies of locals. However, while for women the effect of water scarcity is reflected in food production for family consumption, for men, it affects family income through low yield of cash crops. Therefore, for women a potential adaptation strategy to mitigate the effects of climate change might be the rescue of home gardens, optimizing water requirements. For men, strategies might be focused on testing different species or crop varieties of commercial interest and drought resistant.

In comparison with the survey, participatory assessment methodologies generated more actionable information. For example, the surveys identified water scarcity as a climatic hazard, however, this hazard is related to the recent history of deforestation in the area, which only became evident through the participatory activities. This shows that surveys only provide a limited contribution to understanding vulnerability. Participatory assessment methods promote collective spaces for reflection about causes and consequences of certain practices. In this case, one adaptation strategy that participants identified to combat drought in the area, was the restoration of streams to recover water sources. This pilot project yielded a number of practical lessons about how to implement the vulnerability analysis toolkit. The toolkit's flexible design can accommodate different scenarios, and will be used directly in a number of large projects by Bioversity and partners.

Partners:

Institute for Development Studies (UK) – information on this partner's and their role in supporting the project

Bioversity works with Fundación Conserva (www.fundacion conserva.org), a NGO that works in wildlife conservation with rural communities from the Chicamocha canyon in Colombia. Brief details on their role in the project.

Links / sources for further information:

Reid, H., M. Alam, R. Berger, T. Cannon, S. Huq, and A. Milligan. 2009. Community–based adaptation to climate change: An overview. In: Participatory Learning and Action 60. International Institute for Environment and Development (IIED). Pp:9-34

Ulrichs, M., Newsham, A., Naess, L.O., Cannon, T., and Marshall, M. 2014. (In press). Climate Change and Food Security Vulnerability Assessment. Institute of Development Studies/Bioversity International.

Ulrichs, M., Newsham, A., Cannon, T., van Etten J., Morimoto Y., Yumbya, J., Kongola, E., Said, S., van de Gevel J., Newsham, A., Marshall, M., Kabululu, S., Kiambi, D., Nyamongo, D., Fadda, C. 2015. Assessing climate change vulnerability and its effects on food security: Testing a new toolkit in Tanzania. CCAFS Working Paper No. 91

Wilbanks, T. J. and R. W. Kates. 1999. Global change in local places: How scale matters. Climatic Change 43: 601–628.

A CCAFS working paper specifically about the work in Colombia is forthcoming.

Case Study #4

Title: Building human and institutional capacity for enhancing the conservation and use of neglected and underutilized species of crops in West Africa, and Eastern and Southern Africa

Author: Per Rudebjer

Type: Innovative non-research partnerships;

Project Description:

Crop diversification is an important element in climate-smart agriculture. To diversify production, neglected and underutilized species (NUS) offer many options for climate resilience and better nutrition. However, to effectively use NUS for climate-smart agriculture, countries need to address several constraints such as poor scientific knowledge on many NUS crops, weak value chains, and policies biased towards major staple and commodity crops. CCAFS research contributes to removing these constraints by training agricultural researchers and informing policy makers.

The four-year (2010-2013) project 'Building human and institutional capacity for enhancing the conservation and use of neglected and underutilized species of crops in West Africa, and Eastern and Southern Africa' was funded by the EU through the ACP Science and Technology programme, with co-funding from project partners and the CRPs A4NH and CCAFS.

Designed to strengthen individual and national NUS research capacity in ten countries in Sub-Saharan Africa, the project was jointly implemented by two European and five African organizations, based in Benin, Kenya, Malawi and Uganda (see partner section below), and coordinated by the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), a regional network based in Uganda.

At the core of the project were ten highly participatory training courses targeting young scientists from five countries in West Africa: Benin, Ghana, Mali, Nigeria and Senegal, and five from Eastern/Southern Africa: Ethiopia, Kenya, Malawi, Mozambique and Uganda. These were preceded by sub-regional priority setting to target the project towards a smaller number of priority crops, and to building a research community around those. Knowledge sharing between scientists and sharing of research evidence with policy makers were other key project elements. The project served as a catalyst for research on NUS, contributing to increasing the number of fundable research projects, knowledge sharing and policy influence.

Introduction / objectives:

The objectives of the project were to:

• Increase awareness, and establish the needs for human and institutional capacity for research on and marketing of NUS in West Africa, and Eastern and Southern Africa

• Strengthen capacities in young African scientists to develop and manage inter-disciplinary, multi-stakeholder research projects on NUS

• Disseminate NUS research results and enhance intra-regional sharing of knowledge

• Inform policy makers and institutional leaders on the role and benefits of deploying NUS in R&D strategies and programmes, including the adaptation to climate change

Project Results:

Two sub-regional priority lists of NUS species were developed for Eastern and Southern Africa, and West Africa, respectively, based on country studies in Benin, Ghana, Kenya and Malawi, and expert inputs from five countries per sub-region. This process identified capacity development and policy support needs to guide the projects' focus.

230 scientists from ten countries were trained on NUS research project proposal writing, research design and data management, and scientific communication, as well as the cross-cutting research themes NUS value chain upgrading, and food systems: from agronomy to human health. The lectures, participatory exercises and one-on-one mentoring helped participants improve their proposals or manuscripts, which increased their success rate. Participants typically submitted their revised project proposals to the International Foundation for Science's (IFS) grants programme or other donors.
The project could only train about 15% of the 2000+ young scientist who applied, indicating a significant un-met demand for such capacity development. This larger group of scientists now form a budding 'NUS Community', which is targeted for communications actions via www.nuscommunity.org and social media.
The project co-funded the 3rd International Conference on NUS in September 2013 in Ghana where many former trainees presented posters or oral presentations. The 'Accra statement' summarized the conference recommendations and suggested actions, such as Action 1.1 "Include neglected and underutilized species in national and international strategies, frameworks and programmes to alleviate poverty, ensure food security and adapt to climate change". A policy brief aimed at delivering the conferences' key message to policy makers was published in English, French, Portuguese and Spanish.
These results inspired the development of a new EU-ACP project, funded from 2014-2016, focusing on developing value chains for Bambara groundnut and amaranth (both the grain and leafy types), important to dryland areas affected by climate change and variability.

Partners:

- African Network for Agriculture, Agroforestry and Natural Resources Education (ANAFE), Kenya
- Bioversity International, Rome
- Council for Scientific and Industrial Research, Plant Genetic Resources Research Institute (PGRRI), Ghana
- Institut de Recherché et de Développment sur la Biodiversité des Plantes Cultivées, Aromatiques et Médicinales (IRDCAM), Benin
- International Foundation for Science (IFS), Sweden
- Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), Uganda (Grant manager)
- University of Malawi (UNIMA), Malawi
- University of Nairobi (UoN), Kenya

Links / sources for further information:

Project data is available at: http://www.acp-st.eu/content/building-human-and-institutional-capacity-

enhancing-conservation-and-use-neglected-and-under
A. Dansi, R. Vodouh`e, P. Azokpota, H. Yedomonhan, P. Assogba, A. Adjatin,Y. L. Loko I. Dossou-Aminon and K. Akpagana, 2012. Diversity of the Neglected and Underutilized Crop Species of Importance in Benin. The Scientific World Journal Volume 2012. <http://www.ncbi.nlm.nih.gov/pubmed/22593712 >
Presentations from the 3rd International Conference on Neglected and Underutilized Species: For a Food-Secure Africa are available at: http://www.nuscommunity.org/conference/
Accra statement for a food-secure Africa
Realizing the promise of neglected and underutilized species. Policy brief

5. Outcomes.

Outcome #1:

Guatemala adopts participatory simulation as an approach for climate disaster preparedness

What is the outcome of the research (i.e. use of research results by non-research partners)?

The Ministry of Agriculture, Livestock and Food in Guatemala identified the inventory of climate damages as one of the crucial bottlenecks in their response to climate-induced food security crises. Together with a number of institutions a potential solution was identified: participatory simulations equivalent to "fire drills" but now applied to slow-onset problems such a drought. A new approach was developed, validated and adopted implementing these simulations.

What outputs produced in the three preceding years resulted in this outcome?

- Full report on the simulation study
- Short report on climate simulation for limited distribution in Guatemalan and Central American policy makers https://drive.google.com/?pli=1&authuser=0#folders/0B0VTAnaUDXLBSW1JRGxtWTl6SDQ
- Final simulation manual under construction to facilitate implementation next year

What partners helped in producing the outcome?

Action contre le Faim Guatemala contributed with previous experience in simulations in other contexts and link to relevant stakeholders, specifically CONRED, the National Disaster Response Commisssion.
The Tropical Agricultural Research and Higher Education Center

Who used the output?

Minisitry of Agriculture, Livestock and Food (MAGA) of Guatemala

How was the output used?

The Ministry of Agriculture adopted the approach for 2016.

What is the evidence for this outcome? Specifically, what kind of study was conducted to show the connection between the research and the outcome? Who conducted it?

Letter signed by the vice-minister, indicating MAGA decision to adopt the approach.
https://drive.google.com/?pli=1&authuser=0#folders/0B0VTAnaUDXLBSW1JRGxtWTl6SDQ
Ministry official declares the exercise was "appropriate" to national press:
http://www.elperiodico.com.gt/es/20150203/pais/7990/C%C3%B3mo-un-simulacro-de-sequ%C3%ADa-previene-una-crisis-de-hambre.htm

Outcome #2:

Food Security Bill Supports Climate-Smart Agriculture in India through Sourcing of Climate-Resilient, Nutritious Cereals

What is the outcome of the research (i.e. use of research results by non-research partners)?

India started to implement the National Food Security Act, targeting more than 800 million people. The new law stimulates the inclusion of several millet species and other food grains (called “coarse grains” in India), which are more resistant to climate-induced stresses than wheat and rice, into publicly funded food distribution schemes. The law is the result of research and policy engagement by Bioversity International and its partners, in particular the M.S. Swaminathan Research Foundation, showing the value of small millets.

What outputs produced in the three preceding years resulted in this outcome?

- Padulosi, S., et al. 2009. Food Security and Climate Change: Role of Plant Genetic Resources of Minor Millets.. Indian J. Plant Genet. Resour. 22(1): 1-16 (2009).

-Padulosi, S., Heywood, V., Hunter, D., & Jarvis, A. (2011). Underutilized species and climate change: current status and outlook. Crop Adaptation to Climate Change. Blackwell Publishing Ltd, UK, 507-521.

- Kahane, R., Hodgkin, T., Jaenicke, H., Hoogendoorn, C., Hermann, M., Hughes, J. D. A., Padulosi, S. & Looney, N. (2013). Agrobiodiversity for food security, health and income. Agronomy for Sustainable Development, 33(4), 671-693.

- Frison, A.E. J. Cherfas and T. Hodgkin.2011. Agricultural Biodiversity Is Essential for a Sustainable Improvement in Food and Nutrition Security. Sustainability 2011 (3): 238-253.

- Food and Agriculture Organization of the United Nations (FAO), Bioversity International. 2012. Sustainable Diets and Biodiversity: Directions and solutions for policy, research and action. Rome, Italy: FAO, Bioversity International.

What partners helped in producing the outcome?

M.S. Swaminathan Research Foundation (MSSRF) has contributed with field activities in India and high-level policy engagement through the person of Dr M.S. Swaminathan.

Who used the output?

- National government of India, specifically the National Advisory Council that drafted the Food Security Bill.

- In the near future, state governments who are implementing the Food Security Bill can apply lessons on millet sourcing from the practical experiences of the project (which would be a future outcome).

How was the output used?

The National Advisory Council (NAC) used insights from the project to draft the Food Bill. The Explanatory Note of the draft Food Bill produced by the NAC specifically mentions climate resilience in relation to small millets, as well as nutrition and social inclusiveness to justify this policy decision.

What is the evidence for this outcome? Specifically, what kind of study was conducted to show the connection between the research and the outcome? Who conducted it?

We provide full evidence in a separate document:
https://drive.google.com/?pli=1&authuser=0#folders/0B0VTAnaUDXLBSW1JRGxtWTl6SDQ

The main evidence is provided by:
- Explanatory Note of the draft Food Bill, which mentions small millets in relation to climate resilience http://econpapers.repec.org/RePEc:ess:wpaper:id:3702
- Email from Dr M.S. Swaminathan acknowledging the contribution of the Bioversity-MSSRF project

Outcome #3:

Eight countries on three continents design strategies to discover and use climate-adapted germplasm

What is the outcome of the research (i.e. use of research results by non-research partners)?

In Bhutan, Burkina Faso, Costa Rica, Côte d'Ivoire, Guatemala, Nepal, Rwanda and Uganda, trained government officials, public sector researchers and university professors are designing new strategies to identify and access germplasm that is better adapted to climate changes. Applying geo-spatial tools and data to their national contexts, they assess the changing needs for national and foreign-sourced plant genetic resources for food and agriculture. They are integrating these new strategies into organizational agendas to be implemented with own resources.

What outputs produced in the three preceding years resulted in this outcome?

-In eight workshops organized through 2013 and 2014, 32 women and 77 men from Bhutan, Burkina Faso, Costa Rica, Côte d'Ivoire, Guatemala, Nepal, Rwanda and Uganda trained in the use of climate and crop modelling tools and data sources including the climate analogue tool introduced through CCAFS (see supplementary materials for details).
-Training materials in English, Spanish and French consisting of PowerPoint presentations, reference materials, technical manuals, examples of distribution maps and practical exercises, now being integrated into the Resilient seed systems resource box, an on-line tool (http://www.seedsresourcebox.org).
-Eight training workshop and training workshop evaluation reports were produced.

What partners helped in producing the outcome?

- CIAT, Cali, Colombia: provided initial training on the climate analogue tool
- National Biodiversity Centre, Thimpu, Bhutan
- Ministère de la Recherche scientifique et de l'Innovation, Ouagadougou, Burkina Faso
-Université de Ouagadougou, Burkina Faso Institut de l'Environnement et de Recherches Agricoles, Ouagadougou, Burkina Faso
- Commission Nationale de Gestion des Ressources Phytogénétiques, Ouagadougou, Burkina Faso
- CATIE, Turrialba, Costa Rica
- National Plant Genetic Resources Commission, San Jose, Costa Rica
- Centre National de Recherche Agricole, Abidjan, Côte d'Ivoire
- Université Félix Houphouët-Boigny, Abidjan, Côte d'Ivoire
- CATIE, Guatemala city, Guatemala
- Ministry of Agriculture and Livestock, Guatemala city, Guatemala
- Local Initiatives for Biodiversity, Research and Development, Pokhara, Nepal
- Ministry of Agriculture and Cooperatives, Kathmandu, Nepal
- National Agriculture Genetic Resource Centre, Khumaltar, Lalitpur, Nepal
- Rwanda Agriculture Board, Huye, Rwanda
- Entebbe Botanic Gardens, Entebbe, Uganda
- National Agricultural Research Organisation, Entebbe, Uganda

Who used the output?

In Burkina Faso, researchers are acquiring millet accessions better adapted to the changing climate; they have collected weather data of the last 30 years to underpin their analysis about future trends; planned experiments; and mobilized farmers.

How was the output used?

The researchers in Burkina Faso are now identifying promising new accessions from inside and outside Burkina Faso for current and future climate changes. See supplementary materials for examples from the other project countries.

What is the evidence for this outcome? Specifically, what kind of study was conducted to show the connection between the research and the outcome? Who conducted it?

We provide full evidence in a separate document:
https://drive.google.com/?pli=1&authuser=0#folders/0B0VTAnaUDXLBSW1JRGxtWTl6SDQ

Blog Post CCAFS website.
http://ccafs.cgiar.org/blog/climate-change-models-may-help-spur-lawmakers-implement-seed-treaty#.VMi-3k10zIU

Seven blog posts on GRPI2 blog
https://grpi2.wordpress.com/tag/geospatial-modelling/

Four chapters in the annual GRPI technical reports (2014)

7. Outcome indicators.

Outcome Indicator:

One to five flagship technical and/or institutional approaches identified and developed with farmers, key development and funding agencies (national and international), civil society organizations and private sector in three regions, which would directly enhance the adaptive capacity of the farming systems to the climate change conditions

Achievements:

We are in conversations with World Bank, country governments and others to devise large-scale implementation of the Seeds for Needs approach.

Evidence:

Evidence not defined

Outcome Indicator:

Three food crisis response, post-crisis recovery, and food trade and delivery strategies tested and evaluated with partner crisis response organizations at benchmark locations in three regions

Achievements:

See outcome 1 in Guatemala.

Evidence:

Evidence not defined

Outcome Indicator:

New knowledge on how alternative policy and program options impact agriculture and food security under climate change incorporated into strategy development by at least 3 national agencies, and 3 key international and regional agencies

Achievements:

See 2015 outcomes.

Evidence:

Evidence not defined

8. Leveraged funds.

There is no Leverage funds

9. Publications.

Publication #1:

Improved global cropland data as an essential ingredient for food security.

Citation:

See L, Fritz S, You L, Ramankutty N, Herrero M, Justice C, Becker-Reshef I, Thornton P, Erb K, Gong P, Tang H, Van Der Velde M, Ericksen P, McCallum I, Kraxner F and Obersteiner M. 2014. Improved global cropland data as an essential ingredient for food security. Global Food Security

Identifier	CCAFS Themes	Type	Access
http://dx.doi.org/10.1016/j.gfs.2014.10.004	Theme 4.2,	Peer-reviewed journal articles	Gold

Publication #2:

Climate-smart landscapes: opportunities and challenges for integrating adaptation and mitigation in tropical agriculture.

Citation:

Harvey, C. A., Chacón, M., Donatti, C. I., Garen, E., Hannah, L., Andrade, A., Bede, L., Brown, D., Calle, A., Chará, J., Clement, C., Gray, E., Hoang, M. H., Minang, P., Rodríguez, A. M., Seeberg-Elverfeldt, C., Semroc, B., Shames, S., Smukler, S., Somarriba, E., Torquebiau, E., van Etten, J. and Wollenberg, E. (2014), Climate-Smart Landscapes: Opportunities and Challenges for Integrating Adaptation and Mitigation in Tropical Agriculture. Conservation Letters, 7: 77–90. doi: 10.1111/conl.12066

Identifier	CCAFS Themes	Type	Access
http://dx.doi.org/10.1111/conl.12066	Not defined	Peer-reviewed journal articles	