CCAFS Workplan 2011 for Theme Leaders and Regional Program Leaders

Outcomes: to be achieved by Year 10. Outputs: to be achieved by Year 5. * = milestones carried forward from current Center activities; some will be phased out while others will be brought into line with the overall CRP7 strategy as implementation proceeds

The activities for the former CGIAR Challenge Program CCAFS components were discussed and approved by the CCAFS Steering Committee in New Delhi, 2010 (italics). Since then there have been minor changes to activities and some activities that were not completed in 2010 have been rolled over into 2011. In addition, Centre activities (i.e. those not from the Challenge Program) have been indicated. The proposed partners for the 2011 activities have been indicated. In a number of cases the details of the partnership arrangements have yet to be finalised.

Theme 1. Adaptation to Progressive Climate Change				
MILESTONES (OUTPUT TARGETS)	PERFORMANCE INDICATOR	PARTNERS	Workplan Activities (2011)	Workplan potential partners (2011)
Objective 1.1 Analyze and design processes to support adaptation of farming systems in the face of future uncertainties of climate in space and time				
Outcome 1.1: Agricultural and food security strategies that are adapted towards predicted conditions of climate change promoted and communicated by the key development and funding agencies (national and international), civil society organizations and private sector in at least 20 countries				
Output 1.1.1 Development of farming systems and production technologies adapted to climate change conditions in time and space through design of tools for improving crops, livestock, and agronomic and natural resource management practices				
Milestone 1.1.1.1 Platform established for multi-location trials of technologies and genotypes for GxE interaction analysis and the calibration and evaluation of crop models. (2011)	Number of unique geographic locations, where individual and multi site trials are carried out; assessment of related information and metadata collected; and exchange of derived information	CIAT and other CGIAR centers, CIRAD, JIRCAS, NARES (e.g. EIAR, KARI, NARO, IARI, CRIDA, BARC, BARI NARC, CILSS, etc) and other ARI institutions involved in agricultural trials	Phase 2: Compilation of multi-site trial data (databases and online repository) to be used in year 2 and 3 as the basis for improving models, and analyzing efficacy of potential adaptation options (part funded with regional funds) (continuation of 2010 activities)	CIAT, CIP, ICRISAT, CIMMYT, IWMI, ILRI, NARS
			Activity to be conducted by CIMMIY Validation trials of best-bet CA systems in East Africa and IGP- Data on the yield and other benefits (e.g. labour, fuel/animal use) of CA options compared to conventional tilled agriculture- Doubts on including it.	Ethiopian Institute of Agricultural Research (EIAR); Kenyan Agricultural Research Institute (KARI); Sustainable Intensification on Maize-Legume Systems in Eastern and Southern Africa (SIMLESA) project.
			Activity to be conducted by CIMMIY: Collation of data of CA trials in East Africa. Output: Data available for use with crop models on the effects of CA on system productivity.	

			Activity to be conducted by CIMMIY: Trials to evaluate the effects of crop rotations under CA conditions in East Africa and IGP. Output: Data on the effects of crop rotations on system productivity and production risks.	
			Activity to be conducted by (approved proposal): Testing potential agricultural adaptation strategies for rainfed agriculture in the semi-arid and dry sub-humid tropics using a combination of model-based ex ante analyses and iterative field-based research on station and in farmers' fields. ESA. Output expected in 2011 : Analogue locations for four important crop growing areas in Kenya and Zimbabwe which comprise (i) cool/dry, (ii) cool/wet, (iii) warm/dry and (iv) warm/wet growing conditions identified and fully characterized	NARES: Kenya, Zimbabwe, GermanyKenyan Meteorological Dept (KMD). Kenya; Kenyan Agricultural Research Institute (KARI), Kenya; Zimbabwe Meteorological Department (ZMD). Zimbabwe; Midlands State University, (MSU) ZimbabweARI: Hamburg University, Faculty of Life Sciences, Germany
			Activity to be conducted by ICARDA: Compilation and analyses of existing databases to collate multi-site trial data on cereals and food legume crops to characterize target environments and establish evaluation and testing sites. Output: Target environments defined and pilot testing sites established.	NARS in the developing and developed world.
			Activity to be conducted by ICARDA through CO-FUNDING (50% restricted): Compilation of existing databases on crop performance related to climate from multiple sources (i.e. multi-site trial data of a range of	BIGM; IWLMP

			crop varieties: Wheat, barley, lentil, chickpea, fababean and grasspea)	
			Activity to be conducted by CIP: Compilation of existing databases on potato & sweet potato performance related to climate from multiple sources	Latinpapa –Latinamerican network of potato breeding programs. CAAS- Chinese Academy of Agricultural Sciences. CPRI –Central Potato Research Institute, India. Key NARIS in AfricaMP3 – RTB – Root, tubers and banana.IRRI, CIRAD, JIRCAS, Egypt
			Activity to be conducted by AfricaRice: Collation of existing multi-site trial data for calibration and validation of crop simulation models. Output: First version of comprehensive multi-site dataset on rice-based systems from multiple sources available	
			Establishment of FACE/FATE experiment in the humid sub tropics (CCAFS grant for the equipment and 2 years of operations funding)	National programs across Africa (invited call to a few), Indian's expertise for support, Open call in EA and WA to start in June (for 1 year)
Milestone 1.1.1.2 Robust methods developed for calculating spatial and temporal analogues of climate. Partner co-authored peer-reviewable method(s) developed and tested codes using pattern-scaled HadCM3 climate output. (2011)	Methods developed and made publicly available through developed communication platforms	University of Reading, with guidance from University of Leeds + local partners (IGP) involved in the implementation phase and web interface development + CIAT	Phase 2: Interface development and Implementation of the Analogue methodology developed in 2010 for examining both spatial and temporal analogues based on multiple climate projections (Theme 1 science funds). T	Consultancy contract for interface development implementation of phase 2 (managed by CIAT), plus University of Reading methodology input,
			Analogue training workshop preparation	Consultancy contract for script development

Milestone 1.1.1.3* One to five flagship technologies identified, developed and demonstrated in each of the 3 initial target regions which would directly enhance the adaptive capacity of the farming systems to the climate change conditions. Launch through high level engagement with key stakeholders at a key international meeting (2015)	Technologies developed and made publicly available. Positive feedback and increased demand of new technologies by the clientele. Field validation and assessment during field visits by different stakeholders made as a part of 2015 visits		Activity to be conducted by ICARDA through CO-FUNDING (50% CRP7, 50% restricted): Development and testing of zero tillage and conservation agriculture technologies in cereal and legume-based cropping systems	CGIAR centers in collaboration with other themes in the MP, NARES, ARIs, CIRAD, NGOs, national governments, Farmers' organisations ICARDA with NARS
Milestone 1.1.1.6*Tools and guidelines developed to support the selection (and / or maintenance) of the most appropriate water storage options and/ or their combinations for river basin development planning under conditions of increasing climate variability; Reviews of tools and guidelines, including links to individual guidelines and access to tools (2013)	Tools and guidelines developed, reviewed and made publicly available	IWMI,WRI-Ghana,PIK,ZEF, MRC	*Activity to be conducted by* IWMI: A combination of GCM downscaling to the basin level, hydrological modeling, literature review, engagement of local communities and other local stakeholders to identify, enhance and test future adaptation scenarios and agricultural risk management strategies	IWMI,WRI-Ghana,PIK,ZEF, MRC
		WRI-Ghana,PIK,ZEF, MRC	*Activity to be conducted by* IWMI: A combination of surveys, modelling, inventory of storage types, economic analyses, and conceptualisation.	
		WRI-Ghana, NBI, WWF-India, IHE-Delft, IITM-India, PIK- Potsdam	Activity to be conducted by through CO-FUNDING by IWMI: Trend analysis, literature review, basin modeling and engagement of local communities stakeholders	WRI-Ghana, NBI, WWF-India, IHE- Delft, IITM-India, PIK- Potsdam
Milestone 1.1.1.7*(2012)	Maps demonstrating the potential for			

Assessment of the potential for exploitation of ground water for crop production in at least three basins	groundwater exploitation, which take adequate account of uncertainty	A number of local universities and NARES in 12 countries in sub-Saharan Africa	*Activity to be conducted* through CO-FUNDING by IWMI:Inventory, evaluation of previous studies on hydro-geology of the region, socio-economic surveys , geo-physical surveys, hydrogeological modeling, RS/GIS analysis, field measurements and surveys. Outout: Improved understanding of groundwater recharge and management under existing and projected climate variability and land management – with recommendation for improved groundwater management as adaptation measure to climate change	NARES: WRI-Ghana, UDS - Ghana; Ministry of Water Resources - Ethiopia; Geological Survey of Ethiopia Universities: KNUST - Ghana; Addis Ababa Univeristy - Ethiopia; Moi University - Kenya; University of Ibadan - Nigeria; Utah State University - USA International Centres: CIRAD - Burkina Faso
Output 1.1.2 Building of regional and national capacities to produce and communicate appropriate adaptation and mitigation strategies for progressive climate change at the national level (e.g. through NAPAs)				
Milestone 1.1.2.1*New knowledge developed on (1) the potential application domains for agricultural practices, technologies and policies (including maps), and (2) best means of transferring these technologies and ensuring their adoption; findings synthesized and presented in report and journal articles (2012)	Synthesis report and journal articles completed and disseminated			
			Activity to be conducted by CIMMYT (2011): Identifying coping and adaptation strategies of farmers and the poor to manage future climate outcomes	IFPRI (Global Futures Project), SIMLESA Project (Africa) CSISA project (IGP-Asia), IITA, ICARDA, ICAR, EIAR, KARI, UMB-USA, UMB-Norway
			Activity to be conducted by CIMMYT : Analysis of future technology options for maize and wheat and ex-ante analysis of their likely future impacts in terms of the economic, social and cultural benefits expected	
			Activity to be conducted by ICARDA: Using production environment descriptors as predictors for adaptive traits of small ruminants	FAO, NARS

			Activity to be conducted by IRRI: Identifying climate change impacts and adaptation pathways in major rice growing areas with specific vulnerabilities	NARES in India, Bangladesh, Indonesia, Vietnam, and the Philippines and ARI in Japan, Germany, USA, Australia
Milestone 1.1.2.3 Training workshop(s) organized and and videos produced on the use of the Analogue methodology ((for examining both spatial and temporal analogues based on multiple climate projections; see 1.1.1.2). Engagement of key IGP stakeholders such as national universities, NARC, ICAR (DWR), BARC, NGOs; Farmer exchanges convened among analogue sites (2011, 2012)	Two trainings (2011, 2012) delivered engaging 25 participants; min 2 videos produced; exchanges convened engaging farmers in 2 regions	National universities, ICAR, BARC, NARC, NGOs	Application pilot of the Analogue tool in at least two regions (regional funds) Case studies. Characterization of sites in IGP and validation EA: characterization between the different systems * Capacity development on the method (IGP regional funds)	WA: Collaboration with ICRAF IGP: CIAT, BARC, Pramod sub-contract to Indian partner coming to Cali by April. Sept: training NARC, ICAR, NGOs
			Costing Adaptation (Case study and testing of the SROI approach - Kenia)	
Output 1.1.3 New knowledge-synthesizing institutional arrangements, policies and mechanisms for improving the adaptive capacity of agricultural sector actors and those involved in managing the food system				
Milestone 1.1.3.1*Document produced that synthesizes institutional arrangements, policies and mechanisms for improving the adaptive capacity of agricultural sector actors (addresses what is working where, how and why, with disaggregation by gender and other social strata) (2011)	Document completed and disseminated	African & South Asian University networks; development NGOs (e.g. CARE, Oxfam, ICCCAD), government, regional bodies	Analyses of rural institutions in enabling adaptation to develop a more profound understanding of how local rural institutional actors respond to the upheavals in livelihood systems that are being triggered by climate change.	Danish Institute for International Studies

		IFPRI (Global Futures Project), SIMLESA Project (Africa) CSISA project (IGP-Asia), IITA, ICARDA, ICAR, EIAR, KARI, UMB-USA, UMB-Norway	Activity to be conducted by CIMMYT –: Scoping study for characterization of climate-adaptation options in maize and wheat production systems in target regions. Output 2011: Synthesis of institutional arrangements, policies and mechanisms for improving the adaptive capacity of agricultural sector actors; what is working where, how and why (Research paper).	IFPRI (Global Futures Project), SIMLESA Project (Africa) CSISA project (IGP-Asia), IITA, ICARDA, ICAR, EIAR, KARI, UMB-USA, UMB-Norway
		Harvard, CCAFS, KARI; MONRE; CERED; COMART	*Activity to be conducted by ICRAF:* Understanding of institutional arrangements, policies and mechanisms that enhance the adaptive capacity of resource-poor households to adopt new farming practices, strategies and behaviours that reduce their vulnerability to CC: synthesis paper.	Harvard, CCAFS, KARI; MONRE; CERED; COMART
			Policy review of adaptation in target countries	Regional partners to be determined
		NARS, ARI, Development organizations,Policy makers, Other CG Centers	*Activity to be conducted by ICARDA:* Identify and promote strategies and methods of drought mitigation and preparedness for progressive climate change conditions. Output: Guidelines and methods	NARS, ARI, Development organizations,Policy makers, Other CG Centers
		INRA-led consortium of 27 partners	*Activity to be conducted by ILRI:* Data assembly (including systems and the analytical framework), analysis and synthesis. Output: Documentation of future vulnerability of livestock systems globally to target interventions	INRA-led consortium of 27 partners

Milestone 1.1.3.2 Web-based platform established (Adaptation and Mitigation Knowledge Network) to share and exchange knowledge, linking farmers' realities and experiences on the ground with multiple and combined research outputs (2011)	Platform developed and made publicly available (cf http://www.sac.ac.uk/climatechange/farmingforabetterclimate/) Number of unique geographic locations, where individual and multi site trials are carried out; assessment of related information and metadata collected; and exchange of derived information	WWF; UNEP; VAAS	*Activity to be conducted by* ICRAF: Characterization of climate adaptation options in target regions. Output: Guidebook for smallholders with candidate adaptation practices	WWF; UNEP; VAAS
		WWF; UNEP	Activities to be conducted by ICRAF: Characterization of climate adaptation options in target regions. Output: Interactive, web-based digital vegetation maps as decision-support tool for present and future climates based on ecological suitability and potential application of useful tree species developed	WWF; UNEP
		IFAD; IRISH-AID	Activities to be conducted by ICRAF: Tools for the adaptation of land use to climate change in Sub-Saharan Africa developed.	IFAD; IRISH-AID
Milestone 1.1.3.3 *Adaptation option portfolio (tool box) for aquaculture systems, options identified and disseminated in Vietnam, tool box disseminated in Bangladesh. Building capacity by creating information and working in partnerships. (2011)	Toolbox available and disseminated	WorldFish, MCD Vietnam, Cantho University ESSP partners IHDP/ZEF University of Bonn or/and SEA START RC	Activity to be conducted by Word Fish: Identification and appraisal of adaptation options in Vietnam aquatic agricultural systems, including economic analysis and trade off analysis (2011 output). The methods developed here will be used in Bangladesh and Mali (2012)	WorldFish, MCD Vietnam, Cantho University, ESSP partners IHDP/ZEF University of Bonn or/and SEA START RC
		ESSP/ CCAFS, UEA	Activity to be conducted by Word Fish : Review of adaptation experiences and options in coastal and aquatic food production systems. Output (2012): Draft Book chapters for Earthscan (publication in 2012). Improve understanding and knowledge of existing and potential adaptation strategies in coastal and aquatic food production systems	ESSP/ CCAFS, UEA

Output 1.1.4 Testing of participatory methods that are sensitive to gender, livelihoods categories and other social differentiators, to apply globally				
Milestone 1.1.4.1 Socially disaggregated participatory methods tested for grounding climate change model results to community-level decision making processes that address food security issues (2014)	Methods tested and disseminated	CIAT, Oxfam, CRS, Learning Alliance, Sustainable Food Lab, SAI	Building pathways for impact in the IGP – seconded staff member to facilitate connections to major development activities for testing and upscaling technologies and practices	World Bank
			Study of social and cultural barriers to adapting through farmer exchanges based on analogous climates; understanding social and cultural perceptions of future climates (through regional funds)	Open competitive call to start by Oct 2011
			Pilot testing of adaptation options for East Africa through system level modelling using biophysical inputs from trial sites database combined with socio-economic models (through EA regional funds)	To be determined
		Oxfam; CRS; Learning Alliance; Sustainable Food Lab	Activity to be conducted by CIAT: Development of gender-sensitivity participatory methods for grounding climate change model results to community level decision making processes that address food security issues	Oxfam; CRS; Learning Alliance; Sustainable Food Lab
Milestone 1.1.4.2 Video testimonials produced on gender-specific farmer adaptation and mitigation strategies (including indigenous knowledge, coping mechanisms and current challenges) in 1-3 sites in each of the 3 initial target regions (2011, 2012)	Video testimonials produced and disseminated through the website		Continued development of video testimonials for each region on gender-specific adaptation and mitigation strategies, adaptive capacity, coping mechanisms and indigenous knowledge	ICT/KM and local NGO partners
			Developing and testing climate adaptation tools in smallholder agriculture through community based action research	Competitive call targeting national and local level actors; selection criteria to be developed

Objective 1.2 Develop breeding strategies for addressing abiotic and biotic stresses induced by future climatic conditions, variability and extremes, including novel climates				
Outcome 1.2: Strategies for addressing abiotic and biotic stresses induced by future climate change, variability and extremes, including novel climates mainstreamed among the majority of the international research agencies who engage with CCAFS, and by national agencies in at least 12 countries				
Output 1.2.1 Understanding and evaluating the response of different varieties/crops to climate change in time and space, and generating comprehensive strategies for crop improvement through a combination of modelling, expert consultation and stakeholder dialogue				
Milestone 1.2.1.1 Research and policy organizations actively engaged in setting research priorities; one regional breeding strategy workshop involving regional decision-making and priority setting bodies delivered in each of 3 initial target regions (2011)	Workshops held engaging 10-15 participants representing major regional and international breeding organizations and decision-making and priority setting bodies. List of research and policy organisations that have commented on, and contributed to, the research design	Crop-breeding institutes (CG Centers, ARIs, NARES), GCP, regional decision-making and priority setting bodies (ASARECA, FARA, WECARD), donors, national governments	Engagement with regional crop improvement institutions to identify potential improvement scenarios and begin to incorporate into models (regional workshops funded with regional funds)	Local partners in three regions; IGP: ICAR, ICRISAT, CIAT and IITA in EA
Milestone 1.2.1.3 Range of crop modeling approaches (to inform breeding) developed and evaluated for biotic and abiotic constraints for the period 2020 to 2050; findings presented in summary report and at key stakeholders' meetings ; *including modelling approaches to evaluate the impacts of climate change and the effects of adaptation technologies such as supplemental irrigation and water harvesting on water availability for crops and their productivity under decadal futures from 2020 to 2050 (2013)	Report completed and disseminated	Crop-based components of MP3, GCP, molecular and breeding platforms, ICARDA and other CG Centers, NARES, ARI breeding institutes, private sector breeding companies, Leeds University	Continued development of crop modelling approaches for major crops to evaluate impacts and run scenario analysis (e.g. crop improvement scenarios). To include initial work on combining niche-based modelling with crop modelling. Development of niche-based modelling for other major crops of the regions of importance to regional food security (in coordination with Themes 4 and 1)	University of Leeds and CIAT
		NARS, ARI, Meteo. Organizations, Other CG Centers	Activity to be conducted by ICARDA through CO-FUNDING(50% restricted, 50%CPR7): Develop modelling approaches to evaluate the impacts of climate change and the effects of adaptation technologies such as supplemental irrigation and water harvesting on water availability for crops and their productivity under decadal futures from 2020 to 2050. Output: a validated crop model .	NARS, ARI, Meteo. Organizations, Other CG Centers

			Cofinancing CGIAR-AfDB adaptation research work on 4 commodity crops, rice, cassava, wheat and maize in regional member countries	IITA, ICARDA, AfricaRice and local partners TBD
			Improved understanding of temperature thresholds used in crop models	University of Leeds
			Collation of regional yield data for crop model calibration and validation for three regions (through regional funds and in collaboration with Theme 4)	National partners to be identified by Regional Facilitators
			Continued development of climate projections, with other themes, including the identification of GCM data for use in CCAFS and the consolidation of downscaled climate surfaces (esp. Theme 4)	Equip, AgMIP, UoL, CIAT, ILRI, IFPRI, CIP
			(Incorporation of pest and disease models into other crop and cropping systems models	TBD pending results of white paper December 2010
			Activity to be conducted by CIMMYT)–: Understanding the distribution, prevalence and epidemiology of maize and wheat insect-pests and diseases and develop tools to forecast changes in range and severity of climate-induced biotic stresses.	
		SENAMHI – National meteorology & Hydrology services Peru & Bolivia EMBRAPA. Brasilian CAAS MP3-RTB	*Activity to be conducted by* CIP: User-friendly geospatial potato & Sweet potato models. Output: Software containing CIP-developed routines for daily climate generators (temperature & rainfall), and for correcting daily rainfall estimated by TRMM downloadable from the MP7 web-site (an advanced beta version)	SENAMHI – National meteorology & Hydrology services Peru & Bolivia EMBRAPA. Brasilian CAAS MP3-RTB

		NARIS in Target countries MP3-RTB	*Activity to be conducted by* CIP: Preliminary suitability maps for selected potato and sweet potato varieties and cultivars	NARIS in Target countries MP3-RTB
Milestone 1.2.1.4 Detailed crop-by-crop strategies and plans of action for crop improvement developed, incorporating portfolio of national, regional and global priorities; findings presented in summary report (2015)	Report completed and disseminated	CG Centers, ARI modelling groups (e.g. Leeds University), NARES scientists		
		CIMMYT, ARIs (USDA-ARS, Swiss Federal Institute of Technology, Texas A & M University, Univ. of Bologna, Italy), NARES in SSA, Asia [Chinese Academy of Agricultural Sciences (CAAS), Yunnan Academy of Agricultural Sciences (YAAS), Indian Council of Agricultural Research (ICAR), Indonesian Agency for Agrl. Research & Development (IAARD)] and LAC (INIFAP-Mexico)	Activity to be conducted by CIMMIY: Analysis of the effects of climate change on growth and yield of maize and wheat. Outputs: 1) Knowledge of the effects of high CO_2 and heat stress on maize and wheat crop phenology, plant functions and yields	CIMMYT, ARIs (USDA-ARS, Swiss Federal Institute of Technology, Texas A & M University, Univ. of Bologna, Italy), NARES in SSA, Asia [Chinese Academy of Agricultural Sciences (CAAS), Yunnan Academy of Agricultural Sciences (YAAS), Indian Council of Agricultural Research (ICAR), Indonesian Agency for Agrl. Research & Development (IAARD)] and LAC (INIFAP-Mexico)
			Analysis of genetic variability in maize and wheat germplasm and identification of heat stress tolerant donors through multi-location managed stress trials	
			Characterization of heat stress tolerance mechanism(s) in maize and wheat and identification of morpho-physiological traits suitable as selection criteria in breeding for heat stress tolerance	
		ILRI, CIAT, University Florida, NARs, University of Deir-Zooir, GSCAR	Activity to be conducted by ICARDA: Selecting salt-tolerant forages and rangeland species. Output by 2015!	ILRI, CIAT, University Florida, NARs, University of Deir-Zooir, GSCAR
Output 1.2.2 Breeding strategies disseminated to key national agencies and research partners				
Output 1.2.3 Differential impact on different social groups of strategies for addressing abiotic and biotic stresses induced by future climate change, variability and extremes are identified, evaluated and disseminated				
Milestone 1.2.3.1 Policy recommendations provided to national agencies, policy makers and key actors in the agricultural sector on how to target strategies to enable equitable access to breeding materials and strategies by different social groups (e.g. pastoralists, fishers, urban	Report completed and disseminated at 3 major international meetings; Report and policy briefs downloaded 200 times from web portal	IFPRI, NARS`	*Activity to be conducted by* ICARDA (through CO-FUNDING: 50% CRP7, 25% CRP11 and 25% CRP2): Assessment of the impact of climate change on cropping patterns, rural income and food security in in	IFPRI, NARS`

farmers) and by women and men (2015)			dry areas with priority given to most vulnerable countries	
		Pan African Bean Research Alliance (PABRA) Kenya, Rwanda, Burundi and Malawi	*Activity to be conducted by* CIAT: PVS/PPB; Testing field selection and data collection. Differentiating among female and male bean variety preferences in a range of dynamic scenarios (low/high stress; market-driven/subsistence)	Pan African Bean Research Alliance (PABRA) Kenya, Rwanda, Burundi and Malawi
		CIP; Bioversity International; NARs; regional breeding bodies; GIPB	*Activity to be conducted by* CIAT: Development of detailed priorities and strategies for breeding of at least 4 crops	CIP; Bioversity International; NARs; regional breeding bodies; GIPB
Objective 1.3 Identify and enhance deployment and conservation of species and genetic diversity for increased resilience and productivity under conditions resulting from climate change				
Outcome 1.3: Portfolio of information sources, guidelines and germplasm available for using genetic and species diversity to enhance adaptation and resilience to changing climate are adopted and up-scaled by national agencies in at least 20 countries and by international organization for the benefits of resource poor farmers				
Output 1.3.1 New knowledge, guidelines and access to germplasm are provided for using genetic and species diversity to enhance adaptation, productivity and resilience to changing climate				
Milestone 1.3.1.1*Accessions identified with potential adaptive traits for climate change adaptation for at least 5 priority crops using innovative methods. Methodology to select genebank material adapted to local current climate conditions and future climate shifts developed and tested and crop suitability atlases for priority crops (as defined by fraction of total production accounted for) produced; findings presented in reports and journal articles (2011, 2014)	Reports completed and disseminated. Journal articles published. Lists produced (e.g., adapted local varieties conserved in genebanks; newly and already collected domesticated and wild germplasm adapted to climate change). Methodology developed and made publicly available	International Center for Tropical Agriculture (CIAT), Colombia; Institute of Biodiversity and Conservation, Ethiopia; National Agricultural Research Institute, Papua new Guinea (PNG); Institut d'Economie Rurale, Mali; Indian Council Agricultural Research, India; Millennium Seed Bank, UK; Botanic Garden Conservation International (BGCI), UK; members of the Musa Taxonomy Advisory Group; University of	*Activity to be conducted by* ICRISAT: Phenotyping mini-core/reference germplasm collections for adaptive traits and virtual crop modelling of traits. Output: Core/reference collections of one mandate species phenotyped under/at analogue environment/locations as an exemplar	International Center for Tropical Agriculture (CIAT), Colombia; Institute of Biodiversity and Conservation, Ethiopia; National Agricultural Research Institute, Papua new Guinea (PNG); Institut d'Economie Rurale, Mali; Indian Council Agricultural Research, India; Millennium Seed Bank, UK; Botanic Garden Conservation International (BGCI), UK; members of the Musa Taxonomy Advisory Group; University of Philippines Los Banos (UPLB), Philippines; KULeuven, Belgium; CIALCA partners; Semongok Agriculture Research Centre (ARC),

		Philippines Los Banos (UPLB), Philippines; KULeuven, Belgium; CIALCA partners; Semongok Agriculture Research Centre (ARC), Sarawak Malaysia; PROINPA, Bolivia		Sarawak Malaysia; PROINPA, Bolivia
		NARS in drought and heat prone areas, ARI	*Activity to be conducted by* ICARDA: Gene mining in cereals and food legumes gene pools for resistance to drought and heat	NARS in drought and heat prone areas, ARI
		NARS, ARI, Other CG centers	*Activity to be conducted by* ICARDA through CO_FUNDING (50% CRP7, 50% restricted): Develop molecular tools and methodologies to rapidly identify candidate germplasm with traits useful for climate change adaptation	NARS, ARI, Other CG centers
		APRI-Egypt, ILRI, FAO/IAEA joint division, University of Goettingen	*Activity to be conducted by* ICARDA : Analyzing functional genomic markers related to the tolerance of indigenous sheep to heat stress under arid conditions	APRI-Egypt, ILRI, FAO/IAEA joint division, University of Goettingen
		IFPRI; BIGM/GRU	*Activity to be conducted by* ICARDA: Develop crop suitability atlas of identified local varieties conserved in genebanks based on genebank information and environmental conditions using Geographic Information system (GIS)	IFPRI; BIGM/GRU
		Breeders, crop physiologists collaborators inside and outside	Breeders, crop physiologists collaborators inside and outside ICARDA	Breeders, crop physiologists collaborators inside and outside ICARDA

		ICARDA	*Activity to be conducted by* CIP through CO-FUNDING: Testing of drought and heat tolerant potato and sweetpotato germplasm	
Milestone 1.3.1.2*Approaches, methods and tools for participatory assessment of where and when biodiversity rich practices facilitate adaptation to climate change reviewed ; findings summarized in report (2011)	Consultation workshops; report completed and disseminated. number of communities and individuals surveyed, number of methods and tools tested	International Union for Conservation of Nature (IUCN), Switzerland; PROINPA, Bolivia; LI-BIRD, Nepal; MS Swaminathan Research Foundation, India; German experts (incl. Prof. K. Hammer); FAO, the International Treaty on Plant Genetic resources for Food and Agriculture (ITPGRFA), Italy; University of Perugia, Italy; University of Basilicata, Italy; Regione Abbruzzo and Regione Basilicata, Italy)	Continuation of farmer based experimentation network in IGP depending on progress, and possible out scaling to other regions (theme 1 core funds)	Bioversity International, ICAR, CIAT, PAU, other local partners in other regions.
Milestone 1.3.1.3.*Evaluation of germplasm of cereals and food legumes for resistance to insect pests and diseases under variable temperature regime; strategy for targeted collection for sampling landraces and wild relatives in dry and hot areas (ICARDA) (2012)	Evaluation and strategy published	IPM researchers and breeders at ICARDA	*Activity to be conducted by* ICARDA: Evaluation of germplasm of cereals and food legumes for resistance to insect pests and diseases under variable temperature regimes	IPM researchers and breeders at ICARDA
		Ethiopian Institute of Agricultural Research (EIAR); Kenyan Agricultural Research Institute (KARI); Department of Agricultural Research and Technology of Malawi (DART); Agricultural Research In Tanzania (ART); Dept. of Research and Special Services DR&SS, Zimbabwe	*Activity to be conducted by* CIAT: Evaluation of drought-selected bean genotypes in contrasting environments in Africa,	Ethiopian Institute of Agricultural Research (EIAR); Kenyan Agricultural Research Institute (KARI); Department of Agricultural Research and Technology of Malawi (DART); Agricultural Research In Tanzania (ART); Dept. of Research and Special Services DR&SS, Zimbabwe
		CORPOICA-Colombia; INTA-Nicaragua; IDIAP-Panama	*Activity to be conducted by* CIAT: Evaluation of *Brachiaria* forage grass hybrids for their	CORPOICA-Colombia; INTA-Nicaragua; IDIAP-Panama

			tolerance to water logging.	
		Embrapa	*Activity to be conducted by* CIAT: Evaluation of herbaceous forage legumes for their tolerance to water logging	Embrapa
Milestone 1.3.1.7 Climate change impact on key global commodities (major Musa groups, cocoa, coconut) and selected pest and diseases modelled and reviewed by commodity network country partners and possible response strategies identified (2015)	Base model available and adapted to specific commodities; findings verified by stakeholders	MUSALAC, BARNESA, BAPNET (including participating countries by region: LAC -Costa Rica, Brazil, Colombia, Panama; ESA - Uganda, Rwanda, Kenya; WCA Ghana, Nigeria, Cote d'Ivoire, Cameroon; APO - India, China, Taiwan, Australia, Indonesia); CIRAD; International Center for Tropical Agriculture (IITA), Nigeria; CIAT, Colombia; University of Western Australia; Queensland Department of Primary Industries, Australia; CacaoNet, COGENT (including participating countries by region: LAC - Costa Rica, Brazil, Trinidad, Mexico; SSA - Cote d'Ivoire, Ghana, Nigeria, Cameroon, Tanzania; APO - India, Sri Lanka, Indonesia, Philippines, Malaysia), Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), France; IITA, Nigeria; CIAT, Colombia; Centro Agronómico	??????????????	MUSALAC, BARNESA, BAPNET (including participating countries by region: LAC -Costa Rica, Brazil, Colombia, Panama; ESA - Uganda, Rwanda, Kenya; WCA Ghana, Nigeria, Cote d'Ivoire, Cameroon; APO - India, China, Taiwan, Australia, Indonesia); CIRAD; International Center for Tropical Agriculture (IITA), Nigeria; CIAT, Colombia; University of Western Australia; Queensland Department of Primary Industries, Australia; CacaoNet, COGENT (including participating countries by region: LAC - Costa Rica, Brazil, Trinidad, Mexico; SSA - Cote d'Ivoire, Ghana, Nigeria, Cameroon, Tanzania; APO - India, Sri Lanka, Indonesia, Philippines, Malaysia), Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), France; IITA, Nigeria; CIAT, Colombia; Centro Agronómico Tropical de Investigación y Enseñanza (CATIE), Costa Rica; South Pacific Commission (SPC), Fiji; United States Department of Agriculture (USDA), USA; University of Queensland, Australia; Reading University, UK;

		Tropical de Investigación y Enseñanza (CATIE), Costa Rica; South Pacific Commission (SPC), Fiji; United States Department of Agriculture (USDA), USA; University of Queensland, Australia; Reading University, UK;		
		(CATIE), Costa Rica; South Pacific Commission (SPC), Fiji; United States Department of Agriculture (USDA), USA; University of Queensland, Australia; Reading University, UK;		(CATIE), Costa Rica; South Pacific Commission (SPC), Fiji; United States Department of Agriculture (USDA), USA; University of Queensland, Australia; Reading University, UK; World Cocoa Foundation; APCC
		World Cocoa Foundation; APCC NARS	Activity to be carried out by ICARDA: Monitoring of population changes and adaptation of insect pests and diseases of cereals and food legumes	NARS
		AU, ECOWAS, Bioversity, FAO	*Activity to be carried out by IITA:* Capacity building and analysis on pest management of key biotic stresses in cassava and banana. Output: Capacity building and analysis on pest management of key biotic stresses in cassava and banana	AU, ECOWAS, Bioversity, FAO
Output 1.3.2 New information, knowledge, guidelines and germplasm are made available to farmers, breeders, local communities and scientists and promoted through knowledge sharing, peer reviewed articles, information systems and media				

Milestone 1.3.2.2. Farmers' traditional knowledge on use of diversity and climate change adaptation documented and made available in at least 3 countries; findings presented in databases, reports and peer- reviewed article (2013)	Databases produced and made publicly available; reports completed and disseminated; journal articles published	Institute of Biodiversity and Conservation, Ethiopia; National Agricultural Research Institute, PNG; Institut d'Economie Rurale, Mali; Indian Council agricultural Research, India	Survey of local and traditional knowledge of adaptation strategies at the farm level through surveys in target regions	Consultant (IGP) and local partners (EA/WA)
			Establishment of a monitoring system of varietal selection under varying climates, initially in West Africa	Potentially CIRAD, possibly DIVERSITAS and other partners to be identified during Cancun Science Meeting.
		NCRRI in Nigeria, SARRNET in Southern Africa	*Activity to be carried out by IITA:* Develop new germplasm catalogues on released cassava germplasm. Output: Catalogue on IITA developed and released cassava germoplasm available	NCRRI in Nigeria, SARRNET in Southern Africa
	Michael Dingkhun activities (TBC)			
Output 1.3.3 Policies to enable access to and use of genetic resources for climate change adaptation research, and diffusion of adapted germplasm				
Milestone 1.3.3.1* Baseline survey and analysis of centers' and partners' acquisitions, and distributions of adapted germplasm carried out; Comparative survey and analysis conducted; findings summarized in reports (2011, 2014)	Reports completed and disseminated. Survey documents developed, Data collected, Draft reports circulated or approval/comment, Publication of reports	CGIAR Centers; Institute of Biodiversity and Conservation, Ethiopia; National Agricultural Research Institute, PNG; Institut d'Economie Rurale, Mali; Indian Council Agricultural Research, India	??????????????	CGIAR Centers; Institute of Biodiversity and Conservation, Ethiopia; National Agricultural Research Institute, PNG; Institut d'Economie Rurale, Mali; Indian Council Agricultural Research, India
		Public and local private seed sector	Activity to be carried out by ICARDA: Develop strategies for fast track testing and release of varieties and rapid multiplication and dissemination of adapted varieties to climate change. Output: Constraints of seed systems identified and appropriate policies formulated .	Public and local private seed sector
		NARS	ICARDA: Organize targeted collection for sampling landraces and wild relatives in dry and hot areas	NARS

Milestone 1.3.3.3 Case studies documented of potential role of informal seed systems for diffusion of adapted germplasm; Analysis of institutions and policies that impact on the flow of adapted materials through those seed systems; National strategies developed to implement the International Treaty's Multilateral system on Access and Benefit-Sharing in 4 countries; Policy options produced at national, provincial and community levels to improve existing policies, local management and seed systems to facilitate diffusion and uptake of adapted germplasm (2013, 2015)	Case studies, analysis, national strategies and policy options developed and disseminated	EMBRAPA, Brazil; Kenyan Agricultural Research Institute (KARI), Kenya; University of Malaya, Malaysia; Instituto Nacional de Investigaciones Agricola (INIA), Peru; MS Swaminathan Research Foundation, India; Local Initiative for Biodiversity, Research and Development (LI-BIRD), Nepal; PROINPA, Bolivia; Institute of Biodiversity and Conservation, Ethiopia; National Agricultural Research Institute, PNG; Institut d'Economie Rurale, Mali; Indian Council Agricultural Research, India	??????????	EMBRAPA, Brazil; Kenyan Agricultural Research Institute (KARI), Kenya; University of Malaya, Malaysia; Instituto Nacional de Investigaciones Agricola (INIA), Peru; MS Swaminathan Research Foundation, India; Local Initiative for Biodiversity, Research and Development (LI-BIRD), Nepal; PROINPA, Bolivia; Institute of Biodiversity and Conservation, Ethiopia; National Agricultural Research Institute, PNG; Institut d'Economie Rurale, Mali; Indian Council Agricultural Research, India
		NARS and public and/or local private seed sector	Activity to be carried out by ICARDA: Analysis of technical, regulatory and policy constraints for seed sector for uptake of adapted varieties to climate change	NARS and public and/or local private seed sector
Milestone 1.3.3.4*Technical contributions to international processes support the development of international policies enabling access to and use of genetic resources in climate change research and adaptation strategies; Background papers and policy briefs developed for intergovernmental meetings including the CGRFA, ITPGRFA, CBD; journal article published on options to reform international policies to reflect increased interdependence of countries on GRFA as a result of climate change; Book published on assessing international policy options to support collective pooling and facilitated use of GRFA published (2011, 2013, 2015)	Papers, policy briefs, Journal article and book published	CGIAR Centers; representatives of regional groups attending intergovernmental fora, secretariats of relevant international agreements	?????????	CGIAR Centers; representatives of regional groups attending intergovernmental fora, secretariats of relevant international agreements

Output 1.3.4 Identification and evaluation of the differential roles of women and men, and other social groups, in strategies for conservation and use of species and genetic diversity; and the impact of those strategies on those different groups, are integrated into knowledge sharing and other activities to achieve outcomes

Theme 2. Adaptation through Managing Climate Risk

MILESTONES (OUTPUT TARGETS)	PERFORMANCE INDICATOR	PARTNERS	Workplan activities (2011)	Workplan potential partners (2011)
Objective 2.1 Identify and test innovations that enable rural communities to better manage climate-related risk and build more resilient livelihoods				
Outcome 2.1: Systematic technical and policy support by development agencies for farm- to community-level agricultural risk management strategies and actions that buffer against climate shocks and enhance livelihood resilience in at least 20 countries				
Output 2.1.1 Synthesized knowledge and evidence on innovative risk management strategies that foster resilient rural livelihoods and sustain a food secure environment				
Milestone 2.1.1.1 Report of priority knowledge and methodology gaps produced for index-based risk transfer products; and Program value-addition and partnership strategy (2011)	Report and journal article completed and disseminated	Key CG (ILRI, IFPRI, CIAT) and other organizations (e.g., WF, WB-CRMG, USAID BASIS CRSP) working on insurance for agriculture, regional (e.g. ECOWAS, IGAD in WA, AIC, ICAR in IGP) and national policy decision makers (CNEDD-Mali, CONEDD-BF, CSE-Senegal, ANE-Mali in WA)	Report on priority knowledge and methodology gaps for index-based risk transfer products; as well as Program value-addition and partnership strategy	Senior Economist(s) Working on Index Based Insurance (TBD)
Milestone 2.1.1.2 Synthesis report produced on options and approaches for reducing risk and enhancing livelihood resilience through cultivar, farm and livelihood diversification; modeling tool developed. *Documentation of how agro-pastoralists are coping with climate risk in West and Southern Africa, and piloting options as to how they may cope with increased climate risk in the future (ILRI) *Review of adaptation experiences and options in coastal and aquatic food production systems (WorldFish) * Characterization of climate-related risk, and survey of current formal and	One report and functional modeling tool completed and disseminated; Earthscan book chapters (WorldFish)	Bioversity International & partners (TBD); ICRAF & partners (VI; CARE; RF; CAS; BMZ; ZALF; COMART); CIMMYT & partners (NARS in Ethiopia, Kenya, India, Bangladesh, Nepal; SIMLESA project, IRRI; Cereal Systems Initiative for South Asia); * PIK, University of Kassel, IER (Mali), IIAM (Mozambique), IFPRI; USDA ARS Lubbock, NARS of Cyprus, Egypt,	Critical review of knowledge on livelihood diversification strategies for climate-resilience.	Bioversity, WorldFish., other CG Centers

informal responses to risk with potential for transfer and up scaling; Upgrade to the ICARDA Agroclimate Tool (ICARDA) (2012)		Ethiopia, Syria		
Milestone 2.1.1.3 Synthesis of ongoing work on agronomic and NRM technologies for enhancing resilience of agriculture to climate variability (2012)			Climate Change Adaptation and Mitigation in Agriculture Science Workshop, Playa del Carmen, Mexico, 1-2 December 2010	Logistics and facilitation by CIAT. Co-funded with Theme 3.
Output 2.1.2 Analytical framework and tools to target and evaluate risk management innovations for resilient rural livelihoods and improved food security				
Milestone 2.1.2.1 Framework report produced and prototype farm household modeling tools developed for evaluating impacts of climate risk and risk management interventions on livelihood resilience (2011)	Framework report and prototype tools completed and disseminated	Resilience Alliance, ILRI, CIP, WorldFish	Develop a framework and methodology for modeling risk and resilience at the farm/household level	In collaboration with Theme 4.2 and multiple CG centers
Output 2.1.3 Development; and demonstration of the feasibility, acceptability and impacts; of innovative risk management strategies and actions for rural communities				
Milestone 2.1.3.1 Participatory pilot demonstrations initiated to develop and evaluate current and improved risk management strategies and actions with rural communities at benchmark locations in 2 countries each in EA, WA and IGP (2011)	Pilot demonstration sites and partners in 6 countries	Pilot demonstration project teams (NMS, NARS, other research partners, development NGOs, farmer associations) to be developed for each benchmark location	IGP, EA, WA: Establish a network of participatory pilot demonstration projects with rural communities to develop and evaluate risk management interventions	IGP: BARC, NARC, ICAR, Columbia water centre, IRI, State agricultural universities WA, EA: Others TBD with Regional Facilitators (inc. competitive calls in East Africa)
Milestone 2.1.3.2 Current strategies and actions for managing climate-related risk documented for rural communities at benchmark locations in EA, WA and IGP (2011)	Documentation completed and disseminated	Pilot demonstration project teams at benchmark locations; ILRI & partners (PIK, U. Kassel, IER (Mali), IIAM (Mozambique), IFPRI); CIMMYT & partners (IFPRI Global Futures Project, SIMLESA Project, CSISA	as part of 2.3.3.1	See 2.1.3.1

		project, IITA, ICARDA, ICAR, EIAR, KARI, UMB-USA, UMB-Norway), IRD-France		
			Developing and testing climate risk management tools in smallholder agriculture through community based action research	Competitive call targeting national and local level actors such as women groups, farmers and CBOs; selection criteria to be developed
Output 2.1.4 Tailor and disseminate research results for evidence-based policy and technical support for farm- to community-level risk management strategies				
Output 2.1.5 Identify and evaluate differential impact of agricultural risk management strategies on different social groups, particularly women and men, and communicate findings through technical and policy support activities				
Milestone 2.1.5.1 Guidelines developed for ensuring equitable participation of women and other socially disadvantaged groups in participatory action research on climate-related risk management. (2011)	Guidelines completed and disseminated	Gender expertise TBD through competitive call	Consultation on identification of gender and social equity issues, and development of research and implementation strategy for climate risk management participatory pilot demonstrations at benchmark locations	FAO, in collaboration with Theme 4.
Milestone 2.1.5.2 Summary report of gender and social differentiation of current risk management strategies and access to associated information and services at benchmark locations in 2 countries each in EA, WA and IGP (2013)	Report completed and disseminated	Gender consultant TBD; Pilot demonstration project teams for each benchmark location	Climate risk discourse through rural radio dialogue amongst farmers, scientists policy makers and private sector service providers	Competitive call to local level partners in EA
			Analyses of rural institutions in enabling adaptation to develop a more profound understanding of how local rural institutional actors respond to the upheavals in livelihood systems that are being triggered by climate change.	Danish Institute for International Studies
Objective 2.2 Identify and test tools and strategies to use advance information to better manage climate risk through food delivery, trade and crisis response				
Outcome 2.2: Better climate-informed management by key international, regional and national agencies of food crisis response, post-crisis recovery, and food trade and delivery in at least 12 countries				
Output 2.2.1 Enhanced knowledge of impacts of climate fluctuations on food security, and how to use advance information to best manage climate-related risk through food delivery, trade, crisis response and post-crisis recovery				
Milestone 2.2.1.1 Report and journal article on impacts of climate variability on components (e.g., production, prices, rural incomes, consumption, trade, humanitarian assistance) of food security; and review of policies to mediate impacts in EA, WA and IGP (2011)	Report completed and journal paper published and disseminated	TBD through competitive call	Analyze impacts of climate variability on components (production, prices, rural incomes, consumption, trade, humanitarian assistance) of food security, and policies to mediate impacts	Competitive call
Output 2.2.2 Synthesized knowledge and evidence of the impacts of alternative risk management interventions within the food system on food security and rural livelihoods, to inform policy and practice				

Milestone 2.2.2.1 Report and policy brief on the costs associated with timing and targeting of alternative food crisis interventions (2011)	Report and policy brief completed and disseminated	WFP, IRI	Assess influence of timing and targeting on costs of food security interventions, to inform investment in improved information and response systems	WFP, IRI
Output 2.2.3 Platform and tools for sharing knowledge and fostering improved coordination among food crisis response, the market-based food delivery system, and agricultural research and development				
Milestone 2.2.3.1 Report and policy brief of an international food system stakeholder consultation to develop a collaborative strategy for improving intervention, coordination, capacity to respond to improved climate-related information (2011)	Report completed and disseminated	Relevant international food security early warning and response organizations, Tufts U.	International food security stakeholder consultation to develop a collaborative strategy for improving intervention, coordination, capacity to respond to improved climate-related information	Relevant international food security organizations, Tufts U., Cornell U.
	Report completed and disseminated	Relevant international food security early warning and response organizations, Tufts U.	Scoping study of current state, trends, emerging opportunities to incorporate advance information into management of climate-related food crises and price fluctuations, in preparation for consultation workshop and subsequent work on improving response with key humanitarian response and trade organizations.	Tufts U.
	Report Completed		Partial salary (Aug-Dec 2010) and travel (Aug-Sep 2010) toward: Case study of regional food security planning in E. Africa and use of climate information for national-level food security decision making in select countries.	WFP, IRI, Red Cross, FewsNet
Milestone 2.2.3.2 Study and stakeholder consultation on regional agricultural and food security contingency planning processes, current and potential use of climate-related information, and strategy for improving planning and coordination in EA, WA and IGP (2011)	3 workshops each engaging at least 10 participants; Study report completed and disseminated.	Relevant regional and national food security, food trade, climate information, early warning and agricultural planning organizations	IGP, WA, EA: Study and stakeholder consultation on regional agricultural and food security contingency planning processes, current and potential use of climate-related information, and strategy for improving planning and coordination (will be linked with 2.2.1 above in terms of partners and approach)	IGP, WA, EA: Relevant regional and national food security and trade organizations TBD with Regional Facilitators
Output 2.2.4 Identify and evaluate differential impact of tools and strategies for climate risk management on different social groups, particularly women and men, and inject findings into support to agencies				
Objective 2.3 Support risk management through enhanced prediction of climate impacts on agriculture, and enhanced climate information and services				
Outcome 2.3 Enhanced uptake and use of improved climate information products and services, and of information about agricultural production and biological threats, by resource-poor farmers, particularly vulnerable groups and women, in at least 12 countries				
Output 2.3.1 Improved climate information tools and products to support management of agricultural and food security risk				

Milestone 2.3.1.1 Historic gridded daily rainfall dataset, combining observations and satellite images, developed and evaluated for 1 country each in EA and WA (2011)	Dataset for 2 countries completed and disseminated; evaluation report completed and disseminated	U. Reading (TAMSAT), IRI, AGRHYMET, Ethiopia Nat'l Met. Authority	Develop and evaluate methodology for combining station observations and remote sensing into gridded daily historic meteorological data sets for agricultural modeling applications	competitive call(45), U. Reading (25), IRI (40); coordinated with EA and WA regional partner activities
	Report Completed		Travel for Dinku (Aug-Sep 2010) and Lyon (Nov-Dec 2010) toward: Initiate development of historic meteorological data set in East and West Africa, for use in agricultural and biological threat forecasting and other climate information service interventions	IRI, Ethiopian NMA, AGHRYMET
Milestone 2.3.1.2 Prototype seasonal forecast information products tailored and evaluated for local agricultural decision-making in 2 countries each in EA, WA (2011)	Tailored products developed for benchmark locations in 2 countries and made publicly available	Senegal Met. Authority, AGRHYMET, ACMAD, IRI, CEREGE, ICRISAT & partners (Zimbabwe Met. Dep., AGRITEX, NGOs)	Methodology and capacity development to tailor seasonal forecasts to crop forecasting and local agricultural decision-making	IRI, Senegal Met. Dep., relevant national and regional climate institutions
Output 2.3.2 Synthesized knowledge and evidence on institutional arrangements and processes for enhancing climate services for agriculture and food security				
Milestone 2.3.2.1 Report and journal article produced on synthesis and program strategy for needs, constraints and opportunities for enhancing climate services, and institutional and ICT-based information delivery mechanisms for agricultural risk management (2011)	Report completed and journal paper published	ACMAD, IGP consultants, IRI	Climate services and delivery mechanisms synthesis and program strategy formulation	ACMAD, IGP consultants, IRI
Output 2.3.3 Improved knowledge, tools, data sets and platforms for monitoring and predicting agricultural production and biological threats, and informing management, in response to climate fluctuations				
Milestone 2.3.3.1 Proof-of-concept on remote sensing data assimilation for crop and rangeland production forecasting reported (2011)	Report completed and disseminated	NASA-JPL, IRI, ICRISAT, IER (Mali)	Develop and evaluate methodology and tools for forecasting climate impacts on crop production	NASA-JPL
Milestone 2.3.3.2 Predictability of crop production and prices from climate information in the IGP reported (2011)	Report completed and disseminated	BARC, NARC, ICAR	IGP: Exploratory study of the predictability of regional crop production and prices from climate information	Co-funded with T2 under Milestone 2.2.1.1.
Milestone 2.3.3.3 Synthesis report on climate-sensitive pest and disease modeling and early warning systems for agricultural and food security risk management (2011)	Report completed and disseminated	Kansas State U.	Synthesis report on climate-sensitive pest and disease modeling and early warning systems for agricultural and food security risk management	Kansas State U. Co-funded by Theme 2.

Milestone 2.3.3.4 Crop and rangeland production forecasting platform, documentation and training materials developed (2013)	Electronic platform publicly available; summary document and training materials completed and disseminated	FAO, JRC, ILRI, IRI, other partners TBD	Crop and rangeland production forecasting methodology development	FAO (35), AGRHYMET & partners (40), NASA-JPL (50), IRI (30)
Output 2.3.4 Enhanced capacity of national and regional climate information providers, NARES and communication intermediaries to design and deliver climate information products and services for agriculture and food security management				
Output 2.3.5 Identify and evaluate differential impact of climate information services on different social groups, particularly women and men, and inject findings into support to farmers				

Theme 3. Pro-Poor Climate Change Mitigation

MILESTONES (OUTPUT TARGETS)	PERFORMANCE INDICATOR	PARTNERS	Workplan activities (2011)	workplan potential partners (2011)
Objective 3.1 Inform decision makers about the impacts of alternative agricultural development pathways				
Outcome 3.1: Enhanced knowledge about agricultural development pathways that lead to better decisions for climate mitigation, poverty alleviation, food security and environmental health, used by national agencies in at least 20 countries				
Output 3.1.1 Analysis of agricultural development pathways and the trade-offs among mitigation, poverty alleviation, food security and environmental health				
Milestone 3.1.1.1 Report on potential emissions reductions from technical options compatible with maintaining food supply (2011)	Report completed and disseminated	Winrock, Applied Geosolutions, BIDS, BCAS	Potential emissions reductions (a) from technical options compatible with maintaining food supply and (b) under alternative intensification scenarios. Two country case studies/region, in collaboration with national agencies; include capacity development (inc IGP regional workshop)	To be selected on a tender basis. WA: IITA IGP: Tender for consultant for status paper; IGP: regional assessments - BARC, NARC, ICAR, NGOs
Milestone 3.1.1.2*Report on potential emissions reductions from technical options compatible with maintaining food supply under alternative intensification scenarios. (2011)	Report completed and disseminated	IFPRI, NARS in Ghana, Senegal, Mali, Uganda, Kenya, India, Nepal, Bangladesh	WA: Cocoa intensification in West Africa and implications for landscape-level mitigation. IGP: Status paper on potential for carbon sequestration in IGP in agriculture; Regional assessment of low carbon options in agriculture	IFPRI, NARS in Ghana, Senegal, Mali, Uganda, Kenya, India, Nepal, Bangladesh
Milestone 3.1.1.5. Assessment report on regional and national agricultural development policies, mitigation policies and mitigation projects and their implications for mitigation, poverty alleviation and food security (2011)	Assessment report completed and disseminated	ECOWAS, UEMOA, CILSS, CORAF, ASARECA, South Asia (TBC)	(a) Global review of low C development strategies to understand linkages to agriculture; (b) Review of mitigation policies and projects in focal regions, with national agencies and with gender lens. (c)Mitigation research planning meetings (1/region)	ASARECA, CORAF and national agencies
Output 3.1.2 Enhanced tools, data and analytic capacity in regional and national policy and research organizations to analyze the implications of different development scenarios and mitigation strategies				

Milestone 3.1.2.1 *Framework for comparison of environmental footprint of agricultural systems (ILRI) (2011)	Framework completed and disseminated	Led by ILRI	Coordination	Led by ILRI
Output 3.1.3 Analysis of the gender and social differentiation implications of alternative agricultural pathways and findings built into communications and capacity building activities				
Objective 3.2 Identify institutional arrangements and incentives that enable smallholder farmers and common-pool resource users to reduce GHGs and improve livelihoods				
Outcome 3.2: Improved knowledge about incentives and institutional arrangements for mitigation practices by resource-poor smallholders (including farmers' organizations), project developers and policy makers in at least 10 countries				
Output 3.2.1 Evidence, analysis and trials to support institutional designs, policy and finance that will deliver benefits to poor farmers and women, and reduce GHG emissions				
Milestone 3.2.1.1 Reviews of promising incentives, institutions, market-based mechanisms and policies at project and national scales, in three initial target regions, including (i) carbon as co-benefit to more productive agricultural practices, (ii) carbon markets, (iii) corporate social responsibility technical assistance, (iv) carbon labelling, summarized in four articles, policy briefs and posted on webpage (2011)	4 policy briefs and scientific articles completed and disseminated. Webpage developed.	FAO, World Bank, BRAC, Pradan, Nature Conservation Research Centre, IIED, IFPRI, ICRA, EcoAgriculture Partners, Ecotrust, Sustainable Food Lab, Unilever, Vi Agroforestry, World Bank, and NARS	Synthesis Book: smallholder mitigation (edited volume, Earthscan),	FAO, IIED, Ecoagriculture
			(b) Project–level action research on economic and technical feasibility of C-market for smallholders (E and W. Africa) (no projects identified yet in IGP)	EcoAgriculture, Ecotrust, World Vision, Vi Agroforestry, CARE, Sustainable Food Lab, World Bank, Cacao Carbon Project, NARS
			(c) National level analysis of options in agriculture either through case studies or expert workshop	Makerere University, BIDS, IIMA, CARE, EPA
			(d) Landscape analysis of Incentives for mitigation at the farm-forest interface (special journal issue, global workshop, synthesis journal article, conference presentation at Earth Systems Governance conference Mar 2011)	Michigan State University
			(e) Analysis of finance channels and resources in smallholder agriculture	Global Carbon
Milestone 3.2.1.2 Experts workshop to identify the design and monitoring requirements of finance and institutional arrangements to better benefit poor farmers and women (2011)	Workshop held; 12-15 participants representing major international and regional organizations dealing with gender issues; Expert consultation completed and summarized; report disseminated	CarbonBenefits, FAO, Vi Agroforestry, CARE, Ecotrust, EcoAgriculture, World Bank, IIED, CLUA, NARS	Workshop: incentives for smallholder mitigation (produce review papers and build community of practice) July	FAO
Milestone 3.2.1.3 *In-depth analysis of the economic incentives and benefits to farmers for integrated practices (conservation agriculture, sustainable land management, and agroforestry) in three initial target regions, linked to Milestone 3.3.1.1 and 3.3.2.2(CIMMYT, IFPRI) (2012)	Journal article completed and disseminated	IFPRI (Global Futures Project), SIMLESA Project (Africa) CSISA project (IGP-Asia), IITA, ICARDA, ICAR, EIAR, KARI, UMB-USA, UMB-Norway	Assessment of current incentives at benchmark sites via impact survey (T4 activity)	To be selected on a tender basis;
Output 3.2.2 Improved capacity to increase the uptake and improve the design of incentives mechanisms and institutional arrangements to deliver benefits to poor farmers and women				

Milestone 3.2.2.3 Training for project implementers on designing finance and institutional arrangements and safeguards specifically to benefit poor farmers and women (2013)	Workshops provide training to 50 individuals per CCAFS region (3)	CarbonBenefits, FAO, Vi Agroforestry, CARE, Ecotrust, EcoAgriculture, World Bank, IIED, CLUA, NARS	Field assessment of role of women and poor in mitigation projects and measures to improve	WOCAN (including national members)
Objective 3.3 Test and identify desirable on-farm practices and their landscape-level implications				
Outcome 3.3: Key agencies dealing with climate mitigation in at least 10 countries promoting technically and economically feasible agricultural mitigation practices that have co-benefits for resource-poor farmers, particularly vulnerable groups and women				
Output 3.3.1 Analysis of mitigation biophysical and socioeconomic feasibility for different agricultural practices and regions, and impacts on emissions, livelihoods and food security				
Output 3.3.2 Methods developed and validated for GHG monitoring and accounting at farm and landscape level to contribute to compliance and voluntary market standards				
Milestone 3.3.2.1 Expert and stakeholder consultations on methods appropriate for smallholder farmers through one global workshop and workshops in each of the 3 initial target regions (2011)	Workshops engage 25 participants each. Consultations completed and summarized.	U. of Aberdeen, Sustainable Food Lab, X-AGG, Duke University, CORAF, ASARECA, RWC, Global Research Alliance	(a) Workshop and commissioned synthesis of emissions methods/models and identification of cost effective methods appropriate for smallholders, as basis for regional working groups to develop methods and build a community of practice	Duke University, T-AGG, ILRI, ICRAF, CIP, IRRI, FAO
			(b) Scoping study and workshop to assess whole farm and AFOLU /landscape GHG accounting options	FAO-MICCA
			(c) Training in national inventory methods in 2 countries (Nepal)	Global Research Alliance, ILRI, NARS in Nepal
			(d) IGP: Comparative evaluation of field level models for simulating GHG emissions from agriculture in IGP region (report on model suitability);	??????
			(e) IGP, WA, EA: GHG emission baselines for the three study regions and benchmark sites (baseline report) (capacity building component)	Winrock and Applied Geosolutions + local partners; IGP: To be selected on a tender basis
			Developing and testing GHG mitigation tools in smallholder agriculture through community action research	Competitive calls
Milestone 3.3.2.2 *Data and methods for carbon measurement and monitoring for integrated agricultural systems (complex landscapes, integrated agriculture, forestry and aquaculture, rangeland and livestock) (ICRAF, WorldFish, ICARDA, ILRI); includes equipment validation for soil carbon field assessments (CIP) (2013)	Data, methodologies, tools and guidelines shared through websites, policy briefs and scientific article	WWF; UNEP; MSU; CSU, Embrapa, Centre of Excellence on Environmental strategy for GREEN business (VGREEN-KU) Kasetsart University, Thailand; ARIs, NARS and universities in the CWANA region, Global Research Alliance, , Princeton University, German Marshall Fund	All GHG landscape analysis (inc wetlands/flooded areas)	ICRAF, CIFOR, IWMI

Milestone 3.3.2.3 Field research initiated at benchmark sites to assess trade-offs for different sectors of agricultural mitigation (livestock, soil carbon, agroforestry) based on biophysical and livelihood outcomes (2012)	Field trials in operation in 10 CCAFS benchmark sites across 3 initial target regions	Partners at CCAFS benchmark sites	Scoping and contacting prospective partner universities per region Develop a 'pool' of Ph.D. students linked to the network Identify fundraising possibilities for the network50	Copenhagen University, ASARECA, CORAF
Milestone 3.3.2.4 Network of PhD students launched for studying GHGs in developing country agriculture to test methods and develop further innovations, linked to Milestone 3.3.2.2 and 3.3.2.3 (2011)	20 PhD students engaged in network per CCAFS region	Copenhagen University, ASARECA, CORAF		
Output 3.3.3 Synthesis of understanding about the direct and indirect economic and environmental costs and benefits from agricultural mitigation				
Output 3.3.4 Analysis of impacts of on-farm and landscape level practices on women and poor farmers				

Theme 4. Integration for Decision Making

MILESTONES (OUTPUT TARGETS)	PERFORMANCE INDICATOR	PARTNERS	Workplan activities (2011)	workplan potential partners (2011)
Objective 4.1 Explore and jointly apply approaches and methods that enhance knowledge to action linkages with a wide range of partners at local, regional and global levels				
Outcome 4.1: Appropriate adaptation and mitigation strategies mainstreamed into national policies in at least 20 countries, in the development plans of at least five economic areas (e.g. ECOWAS, EAC, South Asia) covering each of the target regions, and in the key global processes related to food security and climate change				
Output 4.1.1 For each region, coherent and plausible futures scenarios to 2030 and looking out to 2050 that examine potential development outcomes under a changing climate and assumptions of differing pathways of economic development; developed for the first time in a participative manner with a diverse team of regional stakeholders				
Milestone 4.1.1.1 Capacity built among three regional teams of diverse stakeholders trained in scenarios approaches and engaging with policymakers in their countries/regions and in global CC processes and with the ESSP community; Methodological briefs, papers (2011)	Regional scenarios partners actively participating in regional food security debates and global CC processes (e.g. UNFCCC negotiations and COP). Number of partners using/citing scenarios; No. of regional partners trained in scenarios participating in regional FS debates and global CC processes	Regional Ag Research Orgs (incl. NARS): ASARECA (EA); CORAF, AMCEN (WA); RWC (IGP); Regional policy orgs: NEPAD, CAADP; Int'l NGOs: CARE Int'l; Oxfam; Regional NGOs: Ecotrust (EA); SahelEco, AMEDD (WA); CEAPRED & FPRO (IGP); Private Sector: Katoomba Grp (EA); Technico Pty Limited (IGP); Farmers Orgs: EAFF (EA); ROPPA (WA), IFAP (Int'l); Regional Meteo Orgs: ACMAD, AGRHYMET, ICPAC	Supporting scenarios process and regional capacity in scenarios for linking to global processes and national policy; synthesis of results and evaluation of value of linking local-regional-global scales through scenarios approach	200k to Oxford for scenarios officer salary and travel
			Implementation with partners of various engagement and communication strategies (policy champions, briefs, website, media outreach) for moving scenarios into policy	PANOS, ILRI, ASARECA, IFPRI, IWMI, ICRISAT, ICRAF
			Developing and testing knowledge platforms for communication climate action through community based action research	Competitive call targeting national and local level actors such as women groups, farmers and CBOs; selection criteria to be developed

Milestone 4.1.1.2 Three sets of prototype regional scenarios produced (main regional uncertainties identified, initial regional storylines developed, reports and initial scoping for model analysis). Article on effectiveness of scenarios as a 'boundary object' (2011)	Scenarios reports for EA, WA and IGP available on CCAFS and partners websites; Local media reports from each region	Regional Ag Research Orgs (incl. NARS): ASARECA (EA); CORAF (WA); RWC (IGP); Regional policy orgs: NEPAD, CAADP; Int'l NGOs: CARE Int'l; Oxfam; Regional NGOs: Ecotrust (EA); SahelEco, AMEDD (WA); CEAPRED & FPRO (IGP); Private Sector: Katoomba Grp (EA); Technico Pty Limited (IGP); Farmers Orgs: EAFF (EA); ROPPA (WA), IFAP (Int'l); Regional Meteo Orgs: ACMAD, AGRHYMET, ICPAC	Quantification of regional scenarios in EA, WA, IGP, and initial work on linkage of regional scenarios to the global level and downscaling to the local/household levels	IFPRI, IIASA, AgMIP, others (including regional partners) to be selected
Output 4.1.2 Global and regional maps, tables and associated syntheses, showing current vulnerable agricultural and fishing populations in relation to food security to 2030 and 2050				
Milestone 4.1.2.1 Vulnerability assessment and maps from the three CCAFS regions published and widely disseminated in a paper, policy briefs, conference presentations, workshops, web materials, media stories, inputs to the ag work program/ UNFCCC negotiations, global and regional CC conferences (e.g. COP), contributing to strengthening regional climate and agricultural knowledge platforms/networks and improved CCAFS-related science-user information flows (2012-2013)	Rural ag and fishery community concerns included in UNFCCC negotiations. New regional CCAFS-related working groups and gov't units created in at least 3 regions. CCAFS outputs cited by partners at national, and regional levels. Number of downloads and requests from regional partners for CCAFS products. Number of partners/events in the 3 regions applying processes, tools, approaches bringing together CC-Ag-FS communities in dialogue; number of new projects/programs following these approaches	FANRPAN; START; Africa Acapt; WeAdapt; JotoAfrica; ICAR; BARC; NARC; CAN; CDKN; Harvard Sust. Science program; ICRAF	Evaluation of the vulnerability hotspots mapping; further quantification of these to the 2030s and 2050s at different scales, and linkage to the regional scenarios	U of KwaZulu Natal, Food Economy Group, FAO, Cornell U, GECAFS
			IGP: Capacity building in vulnerability assessment for IGP agricultural sub-regions (including a training workshop)	NARS-India, Bangladesh, Nepal
			EA: Vulnerability and climate risk assessment of the agricultural sector in four countries and mapping policies, institutions and actors related to climate change adaptation, food security, food systems and agricultural development (including a policy dissemination workshop)	National partners TBD. 1 regional consultant to lead the policy mapping study, coordinating 4 national facilitators at EPA (Ethiopia), Ministry of Agriculture, Food and cooperatives (Tanzania), Makerere Univ. (Uganda) and Nairobi University (Kenya)
			Implementation of various engagement, visualization and communication approaches (policy advisory group, maps, films, briefs, website, media outreach) for enhancing use of vulnerability and scenario analyses and maps and other CCAFS outputs in decision making by regional implementing partners and policymakers	USAID, EAC, AU, ASARECA, CORAF
Output 4.1.3 Evidence on, testing and communication of, successful strategies, approaches, policies, and investments contributing to improved science-informed CC-ag development-food security policies and decision making				

NEW Regional capacity strengthened in participatory, gender- and vulnerability-sensitive research on CCAFS issues; research reports from each region (2011)	Training materials and reports available on website; 30 local partners trained		Trainings in participatory, gender & vulnerable groups held	INSAH, CEAPRED, BCAS, AFPRO, NARO, SARI
Output 4.1.4 Analyses providing evidence of the benefits of, strategies for, and enhanced regional capacity in, gender and pro-poor climate change research approaches that will increase the likelihood that CCAFS-related research will benefit women and other vulnerable as well as socially differentiated groups				
Milestone 4.1.4.1 Drawing on Theme 3, CARE-CCAFS report on potential impacts on women and vulnerable groups of new carbon payment schemes; FAO/CCAFS report on gender & climate change issues across CCAFS regions, informing new CCAFS gender strategy (2011)	Number of downloads of CCAFS gender-related reports, briefs, blogs; CCAFS gender work cited in partners' reports/strategies and gender highlighted in national/regional climate, ag and food security strategies	CARE Int'l; FAO; CGIAR Gender & Diversity Program	Develop gender strategy for CCAFS (with CIAT); Develop gender training materials and design and implement regional gender-CC case studies jointly with FAO to inform FAO's gender mainstreaming strategy	FAO, CIAT
NEW Two research grants to women scientists in each of 3 CCAFS regions, based at Universities or NARS, granted	6 new CCAFS-gender studies initiated in 3 regions		Establish a new competitive small grants program for gender-responsive CCAFS research, and funding going to regional female scientists doing research on CCAFS priorities	Universities, NARS in 3 CCAFS regions
Output 4.1.5 Mainstreaming adaptation strategies into national policies, agricultural development plans, and key regional and global processes related to agriculture and rural development, food security and climate change				
Milestone 4.1.5.1 Twenty scenario and vulnerability-focused food security dialogues and new national and regional agricultural policies incorporating climate change (2013)	Number of new national and regional policies and agricultural sector strategies that incorporate CC concerns	ASARECA, CORAF, Ministries of Ag, CC-units, poverty units	Undertake regional engagement activities Develop communications strategy and implement 2011 activities	ASARECA, CORAF, Ministries of Ag, CC-units, poverty units
Output 4.1.6 Building of capacities to engage in global policy making processes and adopt risk management strategies				
Milestone 4.1.6.1 Three trainings sessions are held for a wide variety of stakeholders on UNFCCC negotiation process and policy frameworks such as NAPAs and NAMAs (2012)	Numerous stakeholders are trained in at least 20 countries	UNFCCC, UNDP, AMCEN	Develop engagement and training strategy	UNFCCC, UNDP, AMCEN
Objective 4.2 Assemble data and tools for analysis and planning				
Outcome 4.2 Improved frameworks, databases and methods for planning responses to climate change used by national agencies in at least 20 countries and by at least 10 key international and regional agencies				
Output 4.2.1 Integrated assessment framework, toolkits and databases to assess climate change impacts on agricultural systems and their supporting natural resources				
Milestone 4.2.1.1 Regional site characterization and baseline data collection completed and analysed in three target regions at three levels: household, village, and institution; Synthesis report presents results of baseline survey of farming households re: soil, land, water, livestock, fisheries	13 site reports from baseline surveys made available on CCAFS and partner websites; baseline data shared widely and available on CCAFS website; synthesis CCAFS report and journal article submitted	Univ. of Reading Statistical Group, ASARECA, CORAF, INSAH, ICRAF, ICRISAT, ILRI, IWMI, CEAPRED (Nepal), FPRO (India), BCAS (Bangladesh), CARE Int'l, NARS from Mali,	IGP, WA, EA: Finalise baseline data collection, collation and analyses, including global synthesis IGP, WA, EA: Finalise baseline data collection, collation and analyses, including global synthesis (inc village and organisational baseline) GIS-support for CCAFS mapping activities (4k carry-	Consultants, University of Reading Statistical Services Centre, regional partners

and agroforestry management strategies for adapting to a changing climate, and climate-related information access, needs and uses, implemented across 12 countries in over 200 villages and 5,000 households. Synthesis report of institutional-level baseline work. (2011-2012)		Senegal, Burkina, Niger and Ghana; Univ of Dar & Salian Center (Tanz), Makarere Univ & NARO (Uganda); KARI (Kenya); Managing Risk for Improved Livelihoods (MARIL, Ethiopia)	over) Baseline development and acquisition of satellite imagery	
Milestone 4.2.1.2. Priorities derived for downscaling needs based on an overview of current downscaling initiatives; New products based on innovative methods commissioned and tested, and methods compared and evaluated; Research reports produced on novel downscaling methods and their evaluation; at least one peer-reviewed paper published on comparison of different methods for agricultural impact modelling; * Proof of concept for climate downscaling methodology developed based on wavelets, multifractals and neural networks (CIP) (2012-2013)	Two new products tested and evaluated. Two research reports completed and disseminated. Peer-review paper published. Proof-of-concept completed and disseminated	CIAT, CIP, ILRI, University of Oxford, University of Cape Town, WCRP, IRI. University of California at Santa Barbara	Methodology development for downscaling climate model outputs, daily data reconstruction, daily data generation, for impact evaluation and trade-off analyses: (30k carry-over for Marksim 2) activities for this milestone will be conducted by CIP – see their activity plan under theme 4.2	CIP, U Cape Town, CIAT, ILRI, IRI, Waen Associates
Milestone 4.2.1.3 Suite of downscaled climate data for the 2030s to 2090s, first from the AR4 climate models and then from CMIP5, for homogenized applications in the Program. *Online data repository of downscaled 1km present and future climate projections (CIAT) *Climate projection maps to evaluate future crop suitability (Bioversity) (AR4, 2011; CMIP5, 2012)	Datasets available for download via CCAFS website with appropriate documentation	CIAT, ILRI, University of Oxford, University of Leeds, Waen Associates. *Stanford University, Generation Challenge Programme (GCP)	Acquisition of AR5 scenario climate data and downscaling CMIP5 data; activities for this milestone will be conducted by CIAT – see their activity plan under theme 4.2, 1st row	CIAT, ILRI, University of Oxford, University of Leeds, Waen Associates CIAT, Tyndell Center; Stanford University
Milestone 4.2.1.4 Regional climate characterization and evaluation of global and regional climate model performance for the three initial target regions (2011)	Regional reports that evaluate different climate models, for the three initial target regions, from the perspective of agricultural impacts modelling	University of Oxford	Regional climate characterisation and GCM / RCM performance evaluated for all target regions(18k carryover)	Oxford University

Milestone 4.2.1.5 Regional climate characterization and evaluation of global and regional climate model performance for additional target regions. *Remote sensing databases and maps of vegetation conditions and recent historical changes in Africa developed (ICRAF) (2013)	Regional reports that evaluate different climate models, for additional target regions, from the perspective of agricultural impacts modelling	University of Oxford and others to be decided. *AFSIS	Starting up contracts for additional 2 regions activities for this milestone will be conducted by ICRAF – see their activity plan under theme 4.2., 2nd row	ICRAF, Afsis
Milestone 4.2.1.6 Databases for soils, historical weather, agricultural systems, and natural resources in the target regions evaluated, gap-filled, collated and made available on the web, following the development and implementation of an appropriate data management policy. *Working version of crop production surfaces developed to model biophysical responses to environmental change (IFPRI). *Enhanced niche-based approaches developed and published for analysis of climate change impacts on major/minor crops (CIAT) *Simulation models on yields and emissions in rice production systems assessed for their use in decision support systems (IRRI) (2012-2014)	Data reports are written up and made available on CCAFS website, for the following: soils profile information; historical daily weather data; global agricultural systems data layers updated and refined; and agricultural systems data collected and collated for several hundred households at the CCAFS sites	CG centers, all regional partners, selected ARIs. *NARES in India	Data assembly and provision at different scales, for impact assessment: soils data, cropland extent, agricultural systems classification, agricultural systems data; IGP, WA, EA: Regional site characterisation activities and databases (soils, water, climate, other resources for agriculture)(including database) (7k carry-over for soils data (WSU)	IIASA, FAO, HarvestChoice, Consortium for Spatial Information. IGP: BARC, NARC, ICAR, NGOs
			Development and implementation of a strategy for program data storage, management, and dissemination	U Edinburgh, other partners to be selected on a direct contracting basis.
			activities for this milestone will be conducted by CIAT – see their activity plan under theme 4.2., 3rd row	CIAT, University of Leeds; World Bank
			activities for this milestone will be conducted by IRRI – see their activity plan under theme 4.2., 1st row	IRRI, NARES in India
Milestone 4.2.1.7 Scoping studies undertaken on agricultural impact model gaps and needs, particularly at plot and landscape scales, and development and testing work commissioned and evaluated; Synthesis and research reports developed on key gaps and needs, and model documentation (2012-2013))	Model documentation, synthesis and research reports completed and disseminated	CG centers, ARIs, AgMIP (Agricultural Modelling Intercomparison and Improvement Project). *University of Leeds; World Bank	40k carry-over for model scoping and model development; actions arising from crop model meta-analysis (AgMIP) Household modeling review	AgMIP
Milestone 4.2.1.8 Innovative decadal/near-term climate products developed to improve near-term climate prediction and needs and opportunities summarized in research reports (2015)	Model documentation, synthesis and research reports completed and disseminated	IRI, NCAR, UK Met Office, Universities of Oxford & Leeds;	Strategy development for decadal & near-term climate inputs, and AR5 scenario climate data acquisition and analysis 20k carry-over for strategy and tool development for decadal and near-term climate inputs (IRI)	IRI, Oxford U, other partners to be selected

Milestone 4.2.1.9 A loosely-integrated assessment toolkit developed and implemented that can be used to analyze likely effects of specific adaptation and mitigation options in 3 initial target regions; high-level engagement with key users to build capacity in use of tools and data. Reports and meta-databases developed of available models, tools and data. *GLOBIOM-Livestock model used for global integrated assessment of livestock issues (ILRI). *Enhanced/interlinked set of data and quantitative tools including spatial databases, detailed mapping of food system characteristics and human welfare, detailed characterization of impact of changes and uncertainty on global food systems (IFPRI). Integrated assessment framework and toolkit for analyzing likely effects of specific adaptation and mitigation options in three target regions (ICRAF) (2013)	Reports and meta-databases completed and made publicly available	All partners, CG centers, ESSP partners, ARIs. *IIASA, ZALF, FANRPAN, ASARECA, ARIs, NARS, PIK; ASB; UNEP	Model development and evaluation: rangeland model (G-Range); further model scoping and limited model development, to increase capabilities for trade-off and impact analyses within CRP7 and globally. (G-range 5k carry-over)	Colorado State U, IFPRI, AgMIP, ICASA. Other partners to be selected via direct contracting on basis of scoping work
			Contributions to milestone 4.1.1.2 regional scenarios (50k)	U Oxford
			Contributions to milestone 4.1.2.1 quantification of vulnerability assessment (30k)	ILRI
			activities for this milestone will be conducted by ILRI – see their activity plan under theme 4.2., 1st row	ILRI, IIASA
			activities for this milestone will be conducted by ICRAF – see their activity plan under theme 4.2., 1st row - Methods and tools made available widely to partners and on website	ICRAF, ZALF; PIK; ASB; UNEP
			Postdoc IGP and capacity building in WA and EA	????
			Developing and testing decision tools for climate change adaptation in smallholder agriculture through community based action research	Competitive call targeting national and local level actors such as women groups, farmers and CBOs; selection criteria to be developed
Output 4.2.2 Socially-differentiated decision aids and information developed and communicated for different stakeholders				
Objective 4.3 Refine frameworks for policy analysis				
Outcome 4.3 New knowledge on how alternative policy and program options impact agriculture and food security under climate change incorporated into strategy development by national agencies in at least 20 countries and by at least 10 key international and regional agencies				
Output 4.3.1 Tools developed and climate change impacts assessed at global and regional levels on agricultural systems (producers, consumers, natural resources), national/regional economies, and international transactions				
Milestone 4.3.1.1 Broad-scale modeling tools developed to assess climate change impacts on yields, production, trade, prices, and various human well-being measures developed or enhanced; models structure design vetted by experts. (2011)	Initial set of modeling tools completed and made publicly available	GLP scientists, CG centers, other ESSP scientists, NARS scientists	Develop materials, methods in generating climate change data to be used in regional capacity development activities that will influence policy decisions on climate change. IGP: Workshop and attachment trainings for understanding and modeling biophysical-socio-economic-policy interactions	Global Land Project under ESSP, PBL, Netherlands, MIT Joint Program on the Science and Policy of Global Change, Integrated Assessment Modelling Community. IGP: IFPRI, ESSP, FAO, IIASA, BARC, NARC, ICAR, NGO
			Enhancements of the IMPACT model (the IMPACT Improvement Task) to include improved demand and the supply systems that incorporate theoretical consistency of underlying parameters, links to GE models to and from IMPACT, and explicit welfare measures and technology adoption modelling	FANRPAN, ASARECA, CORAF CIMMYT, IRRI, ILRI, CIP, ICRAF, ICRISAT, CIAT, National Academy of Agricultural Research Management (NAARM), India, National Centre for Agricultural Economics and Policy Research, India

			Testing policy frameworks that integrate climate change into agriculture and national development through national institutions	Competitive call targeting national and national level actors and institutions
Milestone 4.3.1.2 Global and regional assessments of climate change impacts on agricultural systems, national and international food security completed; Findings included in papers, reports, chapters in global (e.g. IPCC, Biodiversity integrated assessment) and regional (e.g. African Union) assessments (2012)	Papers and reports completed and disseminated. Citations of CCAFS outputs in partners' reports. Chapters of global and regional assessment reports integrate findings	Global Adaptation FUND, UNREDD, the World Bank, IPCC, UNFCCC/SBSTA, key bilateral donors developing adaptation and mitigation strategies, large international NGOs, key regional and national actors, research for develop agencies, national, regional, and international planning agencies, researchers on climate change impacts on agriculture and natural resource management	Produce country reports for West and East Africa on assessing the vulnerability of agriculture to climate change	FANRPAN, ASARECA, CORAF
Output 4.3.2 Likely effects of specific adaptation and mitigation options, national policies (natural resource, trade, macroeconomic, international agreements) analyzed				
Output 4.3.3 Differential impact on social groups (gender, livelihood category etc) of climate change adaptation and mitigation options identified, evaluated and communicated				
Output 4.3.4 Likely effects of specific adaptation and mitigation options and national policies (including for socially differential groups) communicated to key local, national and regional agencies and stakeholders				
Milestone 4.3.4.1 Set of information products developed and disseminated to key agencies and stakeholders including (1) research monographs and policy briefs on climate change; (2) enhanced, and interlinked datasets and quantitative tools such as spatial databases, detailed mapping of food systems and characterization of likely climate change impacts on agricultural systems, and (3) promising adaptation and mitigation options and tools; Publications and tools delivered to individuals responsible for regional policy programs and interventions that foster climate change adaptation and mitigation (2012)	Research monographs and policy briefs completed and disseminated. Datasets and quantitative tools produced and made publicly available. Information products used in regional programs and policy strategies	National and regional partners, other MPs, HarvestChoice, CSI	Continue enhancement of Statplanet (i.e. display national data with specific indicators, view regional maps, customization to interface and visualization, etc), develop web interface between GAMS and IMPACT model, and country by country policy trend analysis. These tools provide policy makers and others with intuitive and straightforward access to complex modeling results that are otherwise the domain only of experts	GAMS Corp., StatPlanet Developer, Amsterdam Optimization Modeling Group LLC,

Milestone 4.3.4.4 Major report targeted to COP17, that lays out climate change impacts, adaptation and mitigation options and national policies; Research monographs and policy briefs on climate change adaptation and mitigation developed; Materials disseminated at Ag & Rural Development Day 2011 (2011) .* Input in the MP7 high level report on the agricultural work program; Platform to ensure coastal communities concern are included in UNFCCC negotiations (WorldFish) (2011)	Report, monographs, policy briefs completed and disseminated. Documentation of web traffic (http://webusage.cgnet.com/); citations in press and scholarly articles	CGIAR centers (CIP, CIAT, IFPRI, ICRISAT, CIMMYT, ICRAF, IWMI, ICARDA, WorldFish) HarvestChoice, CSI	Activities for this center will be conducted by CGIAR centers	CIP, CIAT, IFPRI, ICRISAT, CIMMYT, ICRAF, IWMI, ICARDA
Milestone 4.3.4.6 To enable rural poor, women and men, to have better access to high value commodity markets for climate change mitigation and other environmental resources, support for up-scaling and follow-up investments including (1) implementation of household surveys, (2) development of modules to assess governance factors from the perspective of different value change actors, (3) identification of interventions to improve access to markets for climate change mitigation, (4) engagement with network or policy advisors, policy researchers and program implementers; (5) highlight the need to act on the climate challenge while supporting other important rural development and environmental goals through policy fora and dialogues (at Regional Fora and Launch Conference) (2015)	Surveys completed, summarized and results shared. Governance factor modules and interventions developed and disseminated. Briefings delivered to 300 individuals representing 30 organizations. CCAFS materials shared through 20 policy events	National and regional research partners, and stakeholders	Analysis of policy issues, in particular those related to improving access by small farmers to new market opportunities in agriculture, especially for high value products, and for climate change mitigation and other environmental services	MoFA (Ghana), Ministry of Agriculture and Water Resource in Nigeria, Nigeria Agricultural Policy Support Facility, Universities in Africa and South Asia, Government Agencies in Africa, Research Institutions