International Agricultural Research

List of

BMZ Funded Projects

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Introductory Remark

Germany supports to the funding of International Agricultural Research Centres (IARCs), especially those backed by the Consultative Group for International Agricultural Research (CGIAR), by providing unrestricted and targeted contributions. One of the aims of targeted funding is to strengthen the cooperation between German and international research institutions.

This brochure contains a list of research projects at IARCs funded by the German Federal Ministry for Economic Cooperation and Development (= targeted contribution)[1]. There is a descripition of each project, providing a list of objectives and a summary of results obtained thus far. Relevant addresses, including German research partners, are also given. The list is designed merely as guide to ongoing projects. If you are interested in more detailed information, please contact either the IARCs directly or the German Partner Institutes.

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Head Division Rural Development,
World Food Security (314)

German Federal Ministry for Economic
Cooperation and Development (BMZ)

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Research for Development

Deutsche Gesellschaft für Technische
Zusammenarbeit (GTZ) GmbH

[1] Previously known as restricted core contributions

Contents

Project Title:
Characterization of the pathogen population structure of bacterial leaf blight of rice in West Africa as a prerequisite for the identification and deployment of durable resistance

Project Coordinator:
Yacouba Sere, Africa Rice Center, Cotonou, Benin

Project Coordinator email:
y.sere@cgiar.org

Partner Institute:
University of Hannover, Institute of Plant diseases and Plant Protection, Dr. Kerstin Wydra, Hannover, Germany

Partner Institute email:
wydra@ipp.uni.hannover.de

Collaborating Institutions:
INERA Farako-Ba, Maitrise d'Ouvrage du Périmètre Agricole de Bagre, Burkina Faso;
Université de Parakou, Périmètre Irrigue de Malanville, Benin;
IER CRRA de Niono, Office du Niger, Mali;
INRAN Kolo, ONAHA, Niger;
Projet Riz Irrigue ADRAO, SAED, Senegal;
ITRA, Togo;

Region:
West Africa

Country:
Benin, Burkina Faso, Mali, Niger, Senegal, Togo

Thematic Priority:
Not available

Major Research Domain:
Rice, bacterial blight, oryza sativa, O. glaberrima, Xanthomonas oryzae pv. oryzae, pathogen vaiability, resistance

Budget:
60,000 €

Goal:
To develop an integrated management program for bacterial leaf blight based on varietal resistance and sound knowledge of the pathogen's population structure in order to contribute to securing stable and high-yielding rice production in smallholder rice farmers' fields

Purpose:
To eliminate the information gap that has hampered the use of resistant varieties in an IPM approach for reducing BLB impact under African conditions

Outputs:
- BLB epidemics in Mali, Burkina Faso, Senegal, Niger, Benin and Togo documented
- BLB pathogen population structure characterized
- Resistant cultivars identified
- NARS capacity increased in BLB management

Major Results Achieved:
not yet available (new project)

Publications:
Not available

Project Title:
Application of Molecular Markers to Broaden the Genetic Base of Tomato for Improved Tropical Adaptation and Durable Disease Resistance

Project Coordinator:
Dr. P. Hanson, P.O. Box 42, Shanhua, Tainan 741 Taiwan, ROC

Project Coordinator email:
hansp@avrdc.org

Partner Institute:
University of Hannover, Institute of Plant Diseases and Plant Protection, Dr. Kerstin Wydra and Dr. Elisabeth Esch

Partner Institute email:
Not available

Collaborating Institutions:
Indian Institute of Horticultural Science, Bangalore, India;
Tropical Vegetable Research Center, Thailand;
East West Seed Company, Thailand;

Region:
South Asia, Southeast Asia and Pacific

Country:
India, Taiwan, Thailand

Thematic Priority:
Sustainable increase in productivity
Strengthening institutions and improving policy development

Major Research Domain:
tomato, molecular markers, disease resistance

Budget:
1,510,000 €

Goal:
To increase incomes of rural and urban poor in the tropics through better-adapted tomato cultivars that improve productivity for the hot humid lowland tropics in South and Southeast Asia

Purpose:
- To improve tropical tomato cultivars through integration of molecular techniques into tomato breeding programs that permit effective exploitation of tomato genetic resources and create stable disease resistance.
- To provide improved tomato lines for use by NARS and private sector for adoption and national release, and for further improvement in breeding programs.

Outputs:
- PCR-based markers linked to disease resistance for marker assisted selection
- Bacterial wilt resistance mapped and characterized
- Discovery and mapping of novel alleles from wild tomato by Advanced Backcross QTL

- Tomato lines improved for durable disease resistance and tropical adaptation
- Increased NARS capacity to exploit genetic resources through molecular markers

Major Results Achieved:
The marker-assisted selection for begomovirus resistance genes carried out in the project has shown that tropical tomato lines with Ty-2 + Ty-3 showed high levels of resistance in Taiwan and South India. From these results it can be hypothesized that resistance offered by the combination of these two genes may be better than either gene alone. A Tomato Yellow Leaf Curl Virus (TYLCV)-resistant tomato line of the project was found to carry at least one recessive gene for resistance. Mapping of this gene is in progress. Project research on bacterial wilt resistance confirmed that Linkage Group A (LGA) is chromosome 12 and this result established the general locations of bacterial wilt resistance genes on chromosomes 6 and 12. The BW resistance gene(s) on chromosome 12 is/are particularly important for breeders. Incorporation of a wild tomato (Solanum habrochaites) introgression increasing yield into tropical tomato is almost completed and the fine-mapping of the introgression associated with increased lycopene content is underway. Tropical tomato lines with multiple Ty genes developed from the project have progressed sufficiently for multilocation testing. A small group of collaborators has been selected who collectively can evaluate the lines against diverse begomoviruses. Nine tomato lines resistant to bacterial wilt and begomovirus were developed in the project and distributed to 25 countries in 2007.

Publications:
- Application of molecular markers to broaden the genetic base of tomato for improved tropical adaptation and durable disease resistance. Workshop results 14-16 April 2004, AVRDC, Shanhua Taiwan, 14 pages.
- Dahal, D., Braun, H.-P., Heintz, D., Pich, A., Wydra, K. Analysis of tomato stem and xylem proteom in response to infection by Ralstonia solanacearum. Deutsche Pflanzenschutztagung Kiel, 2008, Mitt. Biologische Bundesanstalt 417
- Dahal, D., Heintz, D., Van Dorsselaer, A., Braun, H.-P., Wydra, K. 2008. Pathogenicity and stress related proteins are regulated in tomato stems infected with Ralstonia solanacearum. (submitted to Mol Plant Pathol)
- Dahal, D., Wydra, K. 2008. Proteomics approach to characterize the reaction of tomato to infection with Ralstonia solanacearum. Arbeitskreis Phytobakteriologie, Erfurt, September 2008. Journal of Plant Diseases and Plant Protection (in press)
- Graham, E., T.C. Wang and P. Hanson. 2005. Preliminary evaluation of LA 1777 introgression lines for early blight resistance. Rpt. Tomato Genetics Coop. 55: 15-18.
- Hai, T.T.H, E. Esch, and J.-F. Wang. 2008. Resistance to Taiwanese race 1 strains of Ralstonia solanacearum in wild tomato germplasm. European Journal of Plant Pathology 122: 471-479
- Hanson, P., K. Sitathani , A.T.Sadashiva, R.Y. Yang, E. Graham and D. Ledesma. 2007. Performance of Solanum habrochaites LA1777 Introgression Line Hybrids for Marketable Tomato Fruit Yield in Asia. Euphytica 158: 168-178 .
- Wang, Jaw-Fen, Graham, E. B., Kilian, A, Balatero, C. Hautea, D.M., Cameille, A., Besse, P., Jaunet, T. X., Dittapongpitch, V., Hidayati, N., Huang, S.-M., Truong, T.H.H, Hanson, P.M., and de la Peña, R.C. Mapping quantitative resistance loci to bacterial wilt in tomato line Hawaii 7996. 4th International Bacterial Wilt Symposium, York, UK, July 2006.
- Wang, Jaw-Fen, Graham, E. B., Kilian, A, Balatero, C., Cameille, A., Besse, P., Jaunet, T. X., Dittapongpitch, V., Hidayati, N., Huang, S.-M., Truong, T.H.H, Hanson, P.M., and de la Peña, R.C. Mapping bacterial wilt resistance in H7996. Tomato Breeders' Roundtable. Tampa Florida USA. May 2006.
- Wydra, K. and Beri, H. Structural changes of cell walls nvolved in resistance of tomato against Ralstonia solanacearum. 4th International Bacterial Wilt Symposium, York, UK, July 2006.
- Wydra, K. and Schacht, T. Polygalacturonase-inhibiting protein (PGIP) activity in tomato against polygalacturonase of Ralstonia solanacearum. 4th International Bacterial Wilt Symposium, York, UK, July 2006.

Project Title:
Promotion of neglected indigenous vegetable crops (IV) for nutritional health in Eastern and Southern Africa (Phase II)

Project Coordinator:
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Project Coordinator email:
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Partner Institute:
Georg-August-University of Goettingen, Grisebachstr. 6, 37077 Göttingen, Germnay, Dr. Brigitte Maass

Partner Institute email:
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Collaborating Institutions:
IPGRI - IPGRI Sub-Saharan Africa;
Rwanda Institute of Agriculture Research, Rwanda;
Kawanda Agricultural Research Institute, Uganda;
College of Agriculture, Uganda Martyrs University, Uganda;
Horticultural Research Institute, Tengeru, Tanzania;
Dept. of Agricultural Research, Bvumbwe Agricultural Research Station, Malawi;

Region:
East Africa, Southern Africa, Sub-Saharan Africa (SSA)

Country:
Malawi, Rwanda, Tanzania, Uganda

Thematic Priority:
Sustainable increase in productivity
Conservation and efficient use of natural resources and biodiversity

Major Research Domain:
neglected indigenous vegetable crops, seed production, cultivation practices, supply chain, antioxidant compounds, anti-microbial compounds

Budget:
1,050,000 €

Goal:
To improve household food security of resource-poor groups in Eastern and Southern Africa by; 1) Safeguarding biodiversity of indigenous vegetables (IVs), 2) reducing malnutrition and poverty among small-scale farmers and consumers through promotion, production and consumption of IVs and 3) diversifying and stabilizing farmers' income and nutritional health through higher quality seed and improved cultivation practices of IV crops

Purpose:
To enhance genetic resource base, technology dissemination and improved seed of IVs to safeguard biodiversity for better health, nutrition and improved income

Outputs:
To select superior genotypes from collected and characterized germplasm;
To enhance seed production and availability of high quality IV seed;
To increase productivity and yields by improving cultivation practices for selected IV priority crops;
To identify intrinsic nutritional qualities and health promoting factors of IVs;
To map supply chain constraints (input providers to consumers), devise improvements and incentives for improving marketability of IVs;
To develop capacity and provide training of farmers, extension workers, and researchers from the private and public sectors; and
Collate, document, and create awareness on seed production technologies, marketing, cultivation practices and policies that support on-farm diversity of selected IVs.

Major Results Achieved:
Baseline surveys were carried out in the four target countries Malawi, Rwanda, Tanzania and Uganda on indigenous vegetables (IV) which constitute an important group of crops, both in production and consumption. To improve the biodiversity of IV, germplasm collections were made. Improved production technology experiments have been carried out in Tanzania and Malawi. Agronomic trials were carried out and resulted in specific recommendations. AVRDC investigated the nutrient and phytochemical profiles, antioxidant capacities and anti-microbial activities of nightshade, African eggplant, spider-plant and Ethiopian mustard. Studies were carried out on the socio-economic impact of agricultural commercialization of African IV and on changes in small-scale farmers' productivity through adoption of new seed varieties. Creation of awareness on production and utilization practices and nutritional value of micronutrient-rich IV included field days and other activities such as distribution of seed and brochures, awareness campaigns in schools, cooking events and establishment of demonstration plots. Seeds of various IV crops were produced and distributed to project partners and target farmers for evaluation, multiplication, commercialization and consumption. The project carried out a number of training courses on IV production, research, nursery management, IPM techniques, processing, conservation and utilization. Special skills training courses were conducted in Tanzania for self-help women groups and small scale farmers. The project developed the first version of the Vegetable Picture Book with close to 70 IVs commonly used in Tanzania for use during field work. Twelve 'how to grow' IV species booklets have also been drafted. A website with a focus on the PRONIVA project has been set up to further create awareness of project activities (http://www.tropical-resources.uni-goettingen.de/ProNIVA.63.0.html).

Publications:
- AVRDC-RCA. 2004. African Nightshade (Solanum villosum miller), Extension bulletin.
- AVRDC-RCA. 2004. Broad leaved African nightshade (Solanum scabrum miller), Extension bulletin.
- Chadha, M. L., M.O. Oluoch, A.R. Saka, A.P. Mtukuso, and A.T. Daudi (2006). Vegetable Research and Development in Malawi.. Review and Planning Workshop Proceedings, AVRDC Publication series (in Review)
- Jeremia M. 2006. Diversity in Nutritional quality of cowpea (vigna unguiculata) and lablab bean (lablab purpureus) as leafy vegetables. MSc thesis, Georg-August-University Göttingen, Germany
- Keller, G. 2004. African nightshade, eggplant, spiderflower et al. – production and consumption of traditional vegetables in Tanzania from the farmers point of view. MSc thesis at Georg-August-Universität, Göttingen, Germany. 251 p.
- Keller, G.B., Mndiga, H. and Maass, B.L. 2004. Production and consumption issues of traditional vegetables in Tanzania from the farmers' point of view. Seminar presented at Deutscher Tropentag, 5-7 October 2004, Berlin, Germany. Book of Abstracts p. 288.
- Keller, G.B., Mndiga, H. and Maass, B.L. 2004. Use of traditional vegetables in Tanzania: the case of wild Corchorus species (Tiliaceae). Seminar presented at "Botanikertagung", Braunschweig, Germany, 5-10 September 2004. Book of Abstracts p. 344.
- Keller, G.B., Mndiga, H. and Maass, B.L. 2005. Diversity and genetic erosion of traditional vegetables in Tanzania from the farmer's point of view. Plant Genetic Resources –

Characterization and Utilization 3(3):400-413.
- Keller, G.B., Weinberger, K. and Swai, I. (n.d.). Diversity, traits and usage of traditional vegetables in Tanzania. Technical Bulletin of The World Vegetable Center. AVRDC, Taiwan (In preparation).
- Magesa, J. Theme: Diversity in nutritional quality of cowpea (Vigna unguiculata) and lablab bean (Lablab purpureus) as leafy vegetables. MSc thesis in preparation (since 2005) at Georg-August-Universität, Göttingen, Germany.
- Malidadi C. 2006. Cowpea for leafy vegetable use in Malawi: Agronomic evaluation on-station and on-farm. MSc thesis, Georg-August-University Göttingen, Germany.
- Malidadi, Ch. Theme: Agronomic evaluation of cowpea (Vigna unguiculata) for leafy vegetable use in Malawi. MSc thesis in preparation (since 2005) at Georg-August-Universität, Göttingen, Germany.
- Mwai G. and M. O. Oluoch (2006). Recommended cultural practices for nightshade (Solanum scabrum). AVRDC Publication series (in Preparation)
- Oluoch M., M.L. Chadha and D. Silue (2005). Effect of plant population and nitrogen rates on leaf and seed yield of jute mallow (Eds. Tenywa J.S., E. Adipala, P. Nampala, G. Tusiime, P. Okori, W. Kyamuhangire). In African Crop Science Conference Proceedings, vol 7. pp. 83-88.
- Tefera T., 2006. Towards improved vegetable use and conservation of cowpea and lablab: agronomic and participatory evaluation in northeastern Tanzania and genetic diversity study. Ph.D. thesis, Georg-August-University Göttingen, Germany
- Tefera T., M. Oluoch and B. L. Maass, 2006. Identifying vegetable lablab types by participatory assessment: panelists' perceptions of morphological traits and organoleptic taste assessment. Proceedings of the 13th ASA Conference, 10-14 September 2006, Perth, Western Australia
- Tefera T., M. Oluoch and B. L. Maass. 2006. Participatory evaluation of cowpea for vegetable use, Journal of Experimental Agriculture. Submitted
- Tefera Tolera, Oluoch, M. and Maass, B.L. 2005. Participatory evaluation of cowpea (Vigna unguiculata) and lablab (Lablab purpureus) for vegetable use in eastern Africa. Poster presented at Deutscher Tropentag, 11-13 October 2005, Stuttgart-Hohenheim, Germany. Book of Abstracts p. 424.
- Tefera Tolera. Theme: Agronomy, participatory assessment and genetic diversity of African legumes for vegetable use: cowpea (Vigna unguiculata (L.) Walp.) and lablab (Lablab purpureus (L.) Sweet). PhD thesis in preparation (since 2003) at Georg-August-Universität, Göttingen, Germany.
- Weinberger, K., and I. Swai. (2006) "Consumption of Traditional Vegetables in Central and Northeastern Tanzania". Ecology of Food and Nutrition 45 (2): 87-103.
- Weinberger, K., and J. Msuya. (2004) "Indigenous vegetables in Tanzania: Significance and Prospects." Technical Bulletin No. 31. Shanhua: AVRDC.

Project Title:
Genetic, Physiological, and Molecular Approaches to Improve Heat and Drought Tolerance of Tropical Tomato

Project Coordinator:
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Partner Institute:
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Partner Institute email:
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Collaborating Institutions:
AVRDC-Regional Center for Africa, Arusha, Tanzania
Mikocheni Agricultural Research Institute (MARI), Dar-es-Salaam, Tanzania;
University of Dar-es-Salaam (UDES), Tanzania;
ICRISAT, Hyderabad, India
AVRDC-Regional Center for South Asia, Hyderabad, India

Region:
Asia-Pacific (AP), South Asia, Southern Africa

Country:
India, Taiwan, Tanzania

Thematic Priority:
Tolerance to selected abiotic stresses
Increasing income from fruit and vegetables

Major Research Domain:
tomato, abiotic stresses, heat tolerance, drought tolerance, QTL mapping, marker development

Budget:
999,890 €

Goal:
To contribute to stable and increased production of tomato through development of heat and drought tolerant varieties

Purpose:
Development of heat and drought tolerant tomato breeding lines through molecular genetics and genomics, and effective identification and utilization of genetic resources

Outputs:
- Screening methods development for drought and heat tolerance and tolerant germplasm identified
- Head and drought tolerance characterized and QTLs identified in tomato
- Candidate genes for abiotic stress tolerance mapped onto tomato genetic map
- Primary QTLs identified and candidate genes validated for heat and drought tolerance

through comparative and composite analysis
- Breeding lines and linked molecular markers developed for drought and heat tolerance
- Increased NARES/ commercial seed companies/academic institutions´ capacity to screen for drought and heat tolerance and apply molecular markers in breeding

Major Results Achieved:
A planning and training workshop was conducted at AVRDC headquarters in February 2008. All project collaborators attended and presented topics ranging from current research on abiotic stresses to methodologies related to abiotic stress tolerance assessment. A project plan was generated containing the experiments to be conducted and the methodologies for trait assessments. Screening methods to identify drought and heat tolerant tomato germplasm were developed during green house and field trials in Australia, Taiwan, Tanzania, and India. The drought pool and deficit irrigation (gravimetric) methods were found to be effective in identifying drought tolerant genotypes. These methods were used to screen germplasm and populations in genetic experiments to map Quantitative Trait Loci (QTLs) and identify linked markers. In heat tolerance experiments, high pollen viability and low parthenocarpy were identified as key traits for heat tolerance. Sucrose synthase was differentially expressed in heat tolerant genotypes and would be a key gene for marker development.

Publications:
- Bhattarai SP, de la Pena RC, Midmore DJ, Kadirvel P (2008). In vitro culture of immature seed for rapid generation advancement in tomato. Euphytica, DOI 10.1007/s10681-008-9855-6. http://www.springerlink.com/content/a0q81kn7w103u4n4/fulltext.pdf
- Genetic, Physiological, and Molecular Approaches to Improve Heat and Drought Tolerance of Tropical Tomato. Workshop Proceedings, 14-16 April 2004, AVRDC, Shanhua Taiwan (on CD)

Project Title:
Adoption pathways for vegetable integrated pest management technologies reducing pesticide use and pesticide health hazards in India

Project Coordinator:
(PostDoc) Prof. Dr. Volker Hoffmann, Department of Agricultural Communication and Extension, University of Hohenheim, Stuttgart

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Partner Institute:
Not available

Partner Institute email:
Not available

Collaborating Institutions:
University of Hohenheim, Stuttgart

Region:
ASIA

Country:
India

Thematic Priority:
Not available

Major Research Domain:
Diffusion of appropriate crop protection strategies, i.e. pesticides used in vegetable production; information on health hazards and pesticide poising incidences of farmers in vegetable production; Understanding of local knowledge systems, Agricultural Knowledge and Information System (AKIS) and extension; Farmer designed and implemented crop protection trials; Recommendation for policy interventions developed

Budget:
241,140 €

Goal:
Contribute to increased health of producers and consumers of vegetables through reduced occurrence of health hazards among crop growers and reduced pesticide residues locally marketed vegetables in India

Purpose:
Better understanding of factors influencing adoption of integrated pest management practices that will reduce pesticide use and enhance food safety

Outputs:
1. Documented knowledge base on farmers knowledge systems regarding pesticide (mis)use and health impacts
2. Enhanced understanding of domestic market requirements and consumers attitudes towards food safety
3. Identification of gaps at policy level and entry points for improvements
4. Recommendations to improve adoption of integrated pest management practices available

Major Results Achieved:
Preparatory work during the first three months of the project included contribution to the formulation and compilation of questionnaires for a baseline survey on safe vegetable production, and home gardens for diet diversification and better health, development of a data entry sheet to be delivered to the local partners, first contributions to training activities, and attendance to planning meetings.

Publications:
- None so far -

Project Title:
Assessing the contribution of diversified Musa genetic resources to poverty reduction, environmental sustainability and gender equality in rural communities

Project Coordinator:
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Partner Institute:
University of Hannover, Institute of Horticultural Economics, Prof. Dr. Hermann Waibel;

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Collaborating Institutions:
N.N.

Region:
Central America, East Africa, South Asia, Southern Africa, West Africa

Country:
Cameroon, Costa Rica, Ghana, Nicaragua, Philippines, Sri Lanka, Tanzania, Uganda

Thematic Priority:
Increasing income from fruit and vegetables

Major Research Domain:
cost-benefit impact assessment, livelihoods analysis, poverty vulnerability, germplasm conservation, research priority setting, non-market evaluation methods

Budget:
205,000 €

Goal:
To focus the banana research strategies and projects of Bioversity Int. and IITA more clearly on the achievement of MDGs based on the use of ex post impact assessment

Purpose:
Not available

Outputs:
- What has been the impact of the global conservation and distribution of clean banana germplasm?
- What has been the impact of worldwide testing of new banana cultivars?
- Has the dissemination of Musa cultivars contributed to rural development?
- How can impact assessment be used to improve priority setting and delivery of improved banana diversity-related technologies?

Major Results Achieved:
A study on the impact of the global conservation and distribution of clean Musa germplasm by the International Transit Centre (ITC) in Belgium was conducted. It gives an overview of the large expansion of the germplasm collection at ITC over time since its foundation and the

quality standards of conservation. ITC serves as an international standard for the identification of Musa accessions used in research. Impacts have been created in terms of enabling fundamental and applied research on banana, providing genetic diversity to banana breeding programmes, enabling the safe movement of germplasm for testing, adaptation and distribution to small scale farmers. Studies on the impact of cultivar dissemination in Ghana and in Tanzania provided initial conclusions about the potential benefits. According to results from Tanzania, the benefits of dissemination of improved banana cultivars have also reached the poorest among the farmers. Adoption of the improved banana cultivars in the study area was widespread and had an impact on poverty alleviation. A study on the ex-ante impact of Vitamin A rich bananas in three African countries (Ghana, Rwanda and Uganda) was finished. Results show that the potential contribution of such banana cultivars to improve child and maternal health through improved nutrition are significant and cost effective.

Publications:

- Bese, D., Garming, H., Byabachwezi, M., Nkuba, J. and Waibel, H. (2008): The contribution of agricultural research to the MDGs – the case of improved banana varieties in Tanzania. Poster presented at Tropentag 2008, 7-9 October, Stuttgart-Hohenheim, Germany.
- Davey, M.W., Garming, H., Ekesa, B., Roux, N. and Van Bergh, I. (2008): Exploiting banana biodiversity to reduce vitamin A deficiency-related illness: a fast and cost-effective strategy. Presentation at the Tropical Fruit in Human Nutrition & Health Conference, November 8-11, 2008, Gold Coast, Australia.
- Dzomeku, B.M., Staver, C. Aflakpui, G.K.S., Sanogo, D., Garming, H., Ankomah, A.A. Darkey S.K. (2008): Determinants of adoption and impact of new hybrid bananas in Central Ghana. Paper presented at the International Conference on Banana and Plantain in Africa: Harnessing international partnerships to increase research impact. October 5-9, Mombasa, Kenia.
- Garming, H. and Ekesa B. (2008): An ex-ante assessment of the impact of Musa cultivars with high levels of beta-carotenes on the burden of Vitamin A deficiency related illness in three sub-Saharan Africa countries. Report prepared for HarvestPlus, January 2008, Bioversity International.
- Garming, H. and van den Houwe, I. (2008): Study on the impact of ITC, perceptions on the service, analysis of costs and recommendations for rationalization. Bioversity International., forthcoming.

Project Title:
Publication of the book “Gene flow between Crops and their Wild Relatives in Centres of Crop Origin and Diversity”

Project Coordinator:
Dr M. Ehsan Dulloo, Bioversity Int., Via dei Tre Denari 472/a, 00057 Maccarese – Fiumicino, Italy

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Partner Institute:
none

Partner Institute email:
Not available

Collaborating Institutions:
International Center for Tropical Agriculture (CIAT), Cali, Colombia:
Dr Glenn Hyman, Land Use Program,
Universidad del Valle, Engineering Faculty, Civil and Geomatic Engineering School, Topographic Engineering Program (Cali, Colombia):
Dr Juan M. Barraza Burgos, Faculty Dean
Universidad de Costa Rica, San José, Costa Rica:
Dr Ana-Mercedes Espinoza, Centro de Investigación en Biología Celular y Molecular (CIBCM)

Region:
Europe

Country:
Italy

Thematic Priority:
Not available

Major Research Domain:
Food security; crop wild relatives; (agro-)biodiversity; conservation; gene flow; risk assessment

Budget:
39,500 €

Goal:
Academics such as university departments and research institutions that would be more likely to be reached through libraries and other mechanisms that we think might be more effectively reached by Johns Hopkins Press than by Bioversity.

Purpose:
Not available

Outputs:
- Publish the world maps on our institutional website;
- Provide free access to all raw data, including data on the geographic distribution of all crops and their wild relatives;

- Obtain 200 copies of the book to distribute to our own mailing list
- Place 10% of the book-content online (conceded by Johns Hopkins Press);
- Post much or all of the content online in a non-copy and non-print format so that readers can view all information to decide whether they want to purchase the publication or not (depending on further negotiations with Johns Hopkins Press);
- Release a publicly available online database on the institutional webpage, containing crop-specific bibliographic information related to gene flow and crop expert contact details. This database contains gene flow and crop wild relatives-related information extracted from approximately 1.800 references that have been researched for the gene flow project. This database is essentially a "condensed form" of the information contained in the print publication.

Major Results Achieved:
Expert reviews for all crop chapters have been received and comments have been integrated into the book draft. Book chapters No. 1 and No. 2 have been revised by a professional editor. The book manuscript and the 20 coloured world maps have been formatted to comply with the publisher's manuscript guidelines and formatting requirements. Photos have been selected as chapter openers for each of the 20 crop chapters, and publication agreements have been signed between the copyright holders of the images and the authors. The final draft of the book "Gene flow between Crops and their Wild Relatives" by Meike S. Andersson, and Carmen M. de Vicente, with a foreword by Norman C. Ellstrand, has been submitted to Johns Hopkins University Press. The manuscript has undergone copy-editing, has been revised by the authors and returned to the publisher. It has been assigned to the design-and-production department and is currently being type-set. The tentative publication date is 1 September 2009. Information related to the gene flow project has been assembled (including a database of bibliographic references, gene-flow and species-distribution maps, and spatial data). The information is currently being uploaded onto the institutional website of Bioversity International. Release is foreseen by the end of March 2009, probably under the Bioversity theme "Conservation and Use".

Publications:
- Book draft, preliminary title Gene flow between crops and their wild relatives (in print with Johns Hopkins University Press; tentative publication date: 01.09.2009);
- Database of gene flow bibliography (to be published online on Bioversity website);
- Gene flow "risk maps", species-richness maps, and species-distribution maps (to be published online on the institutional website, and "risk maps" in the book as well).

Project Title:
Improving small farm production and marketing of bananas under trees: Resource partitioning, living soils, cultivar choice and marketing strategies

Project Coordinator:
Charles Staver, Bioversity International

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Partner Institute:
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University of Göttingen: Dr Christoph Kleinn, Professor of Forest Inventory and Remote Sensing, ckleinn@gwdg.de.
University of Hannover: Dr Ulrike Grote, School of Economics and Management, grote@iuw.uni-hannover.de
University of Kassel: Dr. Maria Finckh, Ecological Plant Protection, Faculty of Organic Agricultural Sciences, mfinckh@uni-kassel.de

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Collaborating Institutions:
Mesoamerican Scientific Platform – Agro-forestry Systems with Perennial Crops; Costa Rica - University of Costa Rica – Atlantic Campus, Ana Tapia ana.tapia@ucr.ac.cr, Saul Brenes saul.brenes@costarricense.cr; Organic Growers' Association of Turrialba; Ministry of Agriculture - National Musa Program, Victor Solano, vsol1133@yahoo.es.
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Nicaragua - UNAN León – Juan Castellon, Maritza Vargas, vicerectora@unanleon.edu.ni; UNAG Yasica Sur
Perú - INIA – Cesar Aguilar Semino caguilarpe@yahoo.com.ar; Pablo Garcia, garciapehovaz@yahoo.es
Tecnatrop – Enrique Castañeda Parraga castanedaparraga@yahoo.es; GTZ Program for Rural Sustainable Development – Ulrich Röttger,
See Appendix 4 for more information on CATIE, CIRAD, CABI, INCAE, and Promecafe
Costa Rica - University of Costa Rica – Atlantic Campus, Ana Tapia ana.tapia@ucr.ac.cr, Saul Brenes saul.brenes@costarricense.cr; Organic Growers' Association of Turrialba; Ministry of Agriculture - National Musa Program, Victor Solano, vsol1133@yahoo.es.
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Region:
Central America

Country:
Costa Rica, Honduras, Nicaragua, Peru

Thematic Priority:
Promoting conservation and characterization of underutilized plant genetic resources to increase the income of the poor
Increasing income from fruit and vegetables
Rural institutions and their governance

Major Research Domain:
Cutting-edge research on eco-physiology, microbial communities and nutrient cycling of Musa in agro-forests, as well as socio-economic research to target interventions

Budget:
1,198,000 €

Goal:
Rural communities increase their income and food security through more productive, higher quality and more strategically marketed niche and gourmet Musa grown with locally adapted ecologically efficient, clean and profitable agro-forestry techniques

Purpose:
Rural development agencies, non governmental organizations, community based organizations and agricultural research, education and extension programmes use innovative knowledge and tools for prioritizing research, piloting tactics to improve grower management and strengthening grower observation and decision making to increase the small holder productivity of Musa in agro-forests targeted to expanding high value and specialty markets.

Outputs:
Output 1. Methods for prioritizing promising zones for banana agro-forests linked to niche markets as a strategy for poverty reduction piloted
Output 2. Principles of productivity response of banana cultivars to light and water availability in mixed perennial species systems under diverse agro-climates established
Output 3. Strategies for improving root health and increasing nutrient availability for bananas in mixed perennial species systems identified
Output 4. Modelling framework to optimize resource partitioning of mixed agro-forestry systems with bananas developed
Output 5. Potential product markets for niche, high value and gourmet bananas exemplified
Output 6. Strategies, tools and methods to grow and market more valuable bananas in perennial crop agro-forests developed with farmers and their associations

Major Results Achieved:
not yet available

Publications:
Not available

Project Title:
Fighting drought and aluminum toxicity: Integrating functional genomics, phenotypic screening and participatory evaluation with women and small-scale farmers to develop stress-resistant common bean and Brachiaria for the tropics

Project Coordinator:
Dr. I. Rao, Cali, Colombia;
Dr. R. Chirwa, Africa-based;
Dr. Axel Schmidt, Central-America;

Project Coordinator email:
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Partner Institute:
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Collaborating Institutions:
Institut des Sciences Agronomiques du Rwanda (ISAR), Rwanda;
National Dept., Ministry of Agriculture, Malawi;
Bunda College of Agriculture (DARS), Malawi;
Instituto Nicaragüense de Tecnologia Agropecuaria (INTA), Nicaragua;

Region:
Central America, East Africa, South America, Southern Africa

Country:
Colombia, Malawi, Nicaragua, Rwanda

Thematic Priority:
Sustainable increase in productivity
Conservation and efficient use of natural resources and biodiversity

Major Research Domain:
drought stress, aluminium toxicity, marker assisted selection (MAS), common bean, barchiaria

Budget:
1,099,940 €

Goal:
To contribute to food security and sustainability of crop-livestock systems in tropical areas prone to drought stress and aluminum (Al) toxicity

Purpose:
To discover drought and Al resistance candidate genes that are involved in maintaining root elongation under stress; to develop phenotypic and molecular tools to facilitate marker assisted selection (MAS) in common bean and Brachiaria; and to increase benefits to resource-poor farmers from stress-adapted, improved common bean and Brachiaria

Outputs:
- Rural benefits enhanced in the target areas of tropical Africa and Central America by involving farmers as decision makers and co-researchers in the common bean and Brachiaria product development process
- Physiological mechanisms characterized in contrasting parents, interactions defined, and screening methods developed, for: root traits, water and nutrient uptake and transport in roots and effects on shoot growth under individual or combined stress factors of drought stress and aluminum toxicity
- Genomic tools (gene libraries and microarrays) deployed to analyze the effects of drought and aluminum toxicity on expression of genes involved in root elongation, and to identify candidate genes responsible for drought and aluminum resistance in common bean and Bachiaria
- Genetic adaptation improved of common bean and Brachiaria to drought and aluminum toxicity, through deployment of phenotypic screening methods to develop DNA markers
- Capacity of students, NARS researchers and farming communities enhanced in stress physiology, functional genomics, molecular breeding, and participatory research and development (with special focus on participatory variety selection)

Major Results Achieved:
Participatory varietal selection (PVS) of beans in Rwanda and Malawi resulted in identification of lines that are being further evaluated in multilocational trials with farmer participation. PVS activities of Brachiaria grasses in Rwanda led to a great demand for forage options from smallholder farmers during the dry season. Genotypic differences in aluminium (Al) resistance in common bean were found not to be constitutive but build up during medium-term exposure of roots to Al. Significant progress was made in the proteomic and transcriptomic approaches to reveal the molecular basis of Al resistance in common bean; and in developing rhizotron system to study the interaction of drought and Al toxicity on root development. Adaptation to drought stress under field conditions in common bean was found to be associated with higher values of pod harvest index, leaf area index and canopy biomass, and lower proportion of pod wall biomass. Use of the soil tube method in the greenhouse contributed to identification of two genotypes of Phaseolus coccineus that were superior in their root development in Al toxic soil conditions. Significant progress was made towards the identification of candidate genes for Al resistance in common bean and Brachiaria. The potential of intergene pool crosses for improved Al resistance in common bean could be confirmed. Forty-two advanced lines were identified at CIAT headquarters for superior Al resistance in the field. Lines have been shipped to Kenya for seed increase and eventual testing in Rwanda.

Publications:
- Beebe, S., I. M. Rao, C. Cajiao and M. Grajales. 2008. Selection for drought resistance in common bean also improves yield in phosphorus limited and favorable environments. Crop Science (in press).
- Beebe, S., I. Rao, J. Polania, M. Grajales and C. Cajiao. 2008. Improved harvest index in drought resistant common beans and possible effects on combining ability. Bean Improvement Cooperative. Annual Report (in press).
- Blair, M.W., L.M. Rodriguez, L. Galindo, M. Ishitani, S.E. Beebe, I.M. Rao. 2006. Characterization of DREB genes as drought tolerance candidates in Common Beans (Phaseolus vulgaris L.). Annual General Meeting Generation Challenge Program, Sao Paulo, Brazil, 12-16 September, 2006.
- Eticha D., I. M. Rao and W. J. Horst. 2007. Interaction between aluminium toxicity and drought stress in common bean (Phaseolus vulgaris L.) genotypes. Poster presented on the Annual Meeting of the German Society of Plant Nutrition – DGP in Berlin, Germany.
- Hausler, K., I. M. Rao and R. Schultze-Kraft and late H. Marschner. 2006. Shoot and root growth of two tropical grasses, Brachiaria ruziziensis and B. dictyoneura as influenced by aluminum toxicity and phosphorus deficiency in a sandy loam Oxisol of the eastern plains of Colombia. Trop. Grasslands 40: 213-221.
- Manrique, G., I. Rao and S. Beebe. 2006. Identification of aluminum resistant common bean genotypes using a hydroponic screening method. Paper presented at the 18th World

Congress of Soil Science, Philadelphia, USA. July 9-15, 2006 (Oral and poster paper).
- Polania, J., I. M. Rao, S. Beebe and R. García. 2007. Evaluación del desarrollo y distribución de raíces bajo estrés por sequía en 16 genotipos de frijol común (Phaseolus vulgaris L.) usando cilindros plasticos en condiciones de invernadero. Paper presented at the XXXVII Congreso Anual de COMALFI (Sociedad Colombiana de Control de Malezas y Fisiologia Vegetal), Santa Marta, Colombia. 2-4 May, 2007.
- Polanía, J., I. M. Rao, S. Beebe and R. García. 2008. Desarrollo y distribución de raices bajo estrés por sequía en frijol común usando tubos con suelo en condiciones de invernadero. Agrociencia (in review).
- Rangel, A. F. 2007. Short- and medium- term effects of aluminium toxicity and resistance in common bean (Phaseolus vulgaris L.). PhD thesis, Gottfried Wilhelm Leibniz Univerität Hannover, Germany.
- Rangel, A. F., I. M. Rao and W. J. Horst. 2007. Spatial aluminum sensitivity of root apices of two common bean (Phaseolus vulgaris L.) genotypes with contrasting aluminum resistance. In: Jahrestagung der Deutschen Gesellschaft für Pflanzenernährung, Berlin, Humbolt-Universität zu Berlin, 57.
- Rangel, A. F., I. M. Rao and W. J. Horst. 2008. Cellular distribution and binding state of aluminum in root apices of common bean (Phaseolus vulgaris L.) genotypes differing in aluminum resistance. Planta (in review).
- Rangel, A.F., I.M. Rao, W.J. Horst. 2006. Short and long term root-growth responses to aluminium in common bean (Phaseolus vulgaris L.). Poster presented on “Plant Nutrition meets Plant Breeding”, first joint conference of the German Society of Plant Nutrition – DGP and the Research Centre for Biotechnology and Plant Breeding, University of Hohenheim – FSP, Stuttgart, Germany.
- Rangel, I. Rao and W. Horst. 2007. Spatial aluminum sensitivity of root apices of two common bean (Phaseolus vulgaris L.) genotypes that are contrasting in aluminium resistance. J. Exp. Bot. 58(14):3895-3904.
- Rao, I. M., J. Polania, R. García and S. Beebe. 2007. Desarrollo de un método en invernadero usando tubos con suelo para cuantificar diferencias fenotípicas en desarrollo y distribución de raíces en líneas avanzadas de fríjol común bajo condiciones de estrés por sequía. Paper presented at the LIII Reunión Anual de PCCMCA (Program Cooperativo Centroamericano para el Mejoramiento de Cultivos y Animales), Antigua Guatemala, Guatemala. 23-27 April, 2007.
- Rao, I. M., S. Beebe, J. Ricaurte, C. Cajiao, J. Polania and R. Garcia. 2007. Phenotypic evaluation of drought resistance in advanced lines of common bean (Phaseolus vulgaris L.). Paper presented at ASA-CSSA-SSSA International Annual Meeting, New Orleans, LA, USA. 4-8 November, 2007.
- Rao, I., J. Miles, P. Wenzl, J. Ricaurte, C. Plazas y R. Garcia. 2006. Avances en el desarollo de hibridos de Brachiaria con adaptación a suelos ácidos. Paper presented at the Seminario de Bioteconologia y ciencias agrarias. Universidad Nacional, Medellin, Colombia. 31 October-I November, 2006.
- Rao, I., J. W. Miles, R. García y J. Ricaurte. 2006. Selección de hibridos de Brachiaria con resistencia a aluminio. Pasturas Tropicales 28: 20-25.
- Rao, I., P. Wenzl, A. Arango, J. Miles, T. Watanabe, T. Shinano, M. Osaki, T. Wagatsuma, G. Manrique, S. Beebe, J. Tohme, M. Ishitani, A. Rangel and W. Horst. 2007. Advances in developing screening methods and improving aluminum resistance in common bean and Brachiaria. Braz. J. Agric. Res. (in review).
- Rao, I., S. Beebe, J. Ricaurte, H. Teran, C. Cajiao, G. Manrique, J. Polania, Y. L. Lopez y M. Blair. 2006. Limitaciones edaficas y climaticas para la producción de frijol comun (Phaseolus vulgaris L.). Paper presented at the Seminario de Bioteconologia y ciencias agrarias. Universidad Nacional, Medellin, Colombia. 31 October-I November, 2006.
- Ricaurte, J., I. M. Rao and C. Menjívar. 2007. Estrategias de enraizamiento de genotipos Brachiaria en suelos ácidos y de baja fertilidad en Colombia. Acta Agronómica (Colombia) 56(3):107-115.
- Rincón, J., J. A. Polania, I. M. Rao, J. Miles and R. García. 2007. Variación genotipica por tolerancia a sequía en Brachiaria bajo condiciones de invernadero usando un sistema de cilindros plasticos transparentes. Paper presented at the XXXVII Congreso Anual de COMALFI (Sociedad Colombiana de Control de Malezas y Fisiologia Vegetal), Santa Marta,

Colombia. 2-4 May, 2007
- Wenzl, P., A. Arango, A. L. Chaves, M. E. Buitrago, G. M. Patiño, J. Miles and I. M. Rao. 2006. A greenhouse method to screen brachiariagrass genotypes for aluminum resistance and root vigor. Crop Sci. 46: 968-973.
- Wenzl, P., A. Chaves, M. Buitrago, G. Patino, J. Miles and I. Rao. 2006. Development and validation of a hydroponic screening method to identify acid soil adapted genotypes of the tropical forage grass Brachiaria. Paper presented at the 18th World Congress of Soil Science, Philadelphia, USA. July 9-15, 2006 (Oral and poster paper).

Project Title:
More chicken and pork in the pot, and money in pocket: Improving forages for monogastric animals with low-income farmers

Project Coordinator:
Michael Peters (coordinator), Forage Germplasm Specialist and Douglas White, Economist

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Partner Institute:
Not available

Partner Institute email:
Not available

Collaborating Institutions:
Instituto Nicaragüense de Tecnología Agropecuaria (INTA), Nicaragua: Martin Mena; Universidad Nacional de Colombia-Palmira, Colombia (UNAL-Palmira): Luz Stella Muñoz, Patricia Isabel Sarria Buenaventura; Universidad del Cauca, Colombia: Nelson Vivas; Consortium for Improved Agriculture-based Livelihoods in Central Africa (CIALCA), DR of Congo (Sud-Kivu mandate area): Dieudonné Katunga

Region:
Central Africa, Central America

Country:
Colombia, Dem.Rep.Congo, Nicaragua

Thematic Priority:
Income increases from livestock

Major Research Domain:
Increasing rural income, Monogastric animals (Swine, Poultry), Tropical Forages, Partnership effectiveness, Technology effects, Markets

Budget:
1,000,000 €

Goal:
To enhance family nutrition and income generation in the rural areas of Colombia, Nicaragua and DR Congo

Purpose:
To foster on-farm production of forage-based protein feeds for improved smallholder monogastric livestock production, across a range of socio-economic contexts

Outputs:
Suitability of forages as feed for pigs and poultry assessed and improved.
Optimal approaches to connect low-income farmers with new forage germplasm and associated feed management practices co-developed and technology effects on households and communities co-assessed.
Possibilities of farmers to extend animal and feed sales within and beyond their community examined.

Major Results Achieved:
not yet available

Publications:
Not available

Project Title:
Strengthening Rural Institutions to Support Livelihood Security for Smallholders Involved in Industrial Tree-planting Programs in Vietnam and Indonesia

Project Coordinator:
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Collaborating Institutions:
Forest Science Institute of Vietnam (FSIV)
Faculty of Forestry, Bogor Agricultural Institute (IPB), Indonesia

Region:
South Asia

Country:
Indonesia, Viet Nam

Thematic Priority:
Rural institutions and their governance

Major Research Domain:
livelihood secrurity. Industrial tree planting, gouvernance of rural institutions, forst management

Budget:
999,944 €

Goal:
Rural smallholders in Southeast Asiaadvance livelihood security and poverty alleviation through involvment in industrial tree-plantingprograms

Purpose:
Rural institutions strengthened and innovative partnerships promoted to increase productivity, profitability, and access to land, credit, and markets for smallholders involved in industrial tree-planting programs in Vietnam and Indonesia

Outputs:
- Policy-relevant scenarios for industrial tree-planting and wood markets, and options for enhanced smallholders engagement
- Assessment of institutional constraints to smallholder livelihood improvement through industrial tree-planting (related to tenure, labor, credit, marketing, and company-community partnerships)
- Decentralized forest management planning system to enhance coordination, efficiency, and productivity of smallholder producer and marketing groups
- Policy recommendations, institutional options and cost-effective planning tools

disseminated to promote enhanced smallholder engagement in industrial tree planting across Vietnam and Indonesia

Major Results Achieved:
not yet available (new project)

Publications:
Not available

Project Title:
Tropical forests, climate change, and vulnerability: Mainstreaming adaptation strategies into policy

Project Coordinator:
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Project Coordinator email:
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Partner Institute:
Institute for Agricultural Policy and Market Research;

Partner Institute email:
Not available

Collaborating Institutions:
None

Region:
West Africa

Country:
Burkina Faso, Ghana, Mali

Thematic Priority:
Integrated land, water and forest management at landscape level

Major Research Domain:
biodiversity conservation, watershed protection, vulnerability assessment, environmental governance, network

Budget:
218,480 €

Goal:
To assist in mainstreaming adaptation strategies into policy through the elucidation of environmental services benefits to national dvelopment goals, and to the livelihoods of the forest dependent population in Western Africa countries

Purpose:
Not available

Outputs:
- To contribute to the identification of adaptation priorities and policy response options
- To provide decision-making support information and tools in the context of adaptation strategies at national development policy level
- To identify paths for mainstreaming adaptation strategies into policy
- To communicate the research results at international conferences and seminars during the project lifetime and beyond
- To place one article in an international peer reviewed journal
- To deliver contributions to electronic and internet based dissemination media

Major Results Achieved:
Field research was conducted in Burkina Faso and Mali on ecosystem vulnerability. Study topics included local management of ecosystems, institutional environment, perceptions on climate change, strategies for adaptation, and innovative tools for financing adaptation. Results were disseminated at a number of conferences and workshops. In Mali, media were supported during a documentary on the project research site. Networking was expanded to several local organisations in the region, NARS and regional organizations like CILSS. The project staff contributed to the design of the future CIFOR research domain Adaptation, Forests and Climate Change.

Publications:
- Locatelli B., Kanninen M., Brockhaus M., Colfer C.J.P., Murdiyarso D., Santoso H., (2008). Facing an Uncertain Future: How forests and people can adapt to climate change. CIFOR Forest Perspectives.
http://www.cifor.cgiar.org/publications/pdf_files/media/cifor_adaptation.pdf
- Brockhaus, M., Kambire, H. (2009). Decentralization – Window of Opportunity for Successful Adaptation? In: Adapting to climate change: thresholds, values, governance (eds.) Adger, N.W., Lorenzoni, I. and O'Brien, K., Cambridge University Press, Cambridge (forthcoming, spring 2009)
http://www.cambridge.org/catalogue/catalogue.asp?isbn=9780521764858
- Brockhaus M., Botoni, E.; Ecosystem services – local benefits, global impacts; Rural 21 The International Journal for Rural Development, DLG Verlag, Frankfurt a.M., Germany (No. 01, 2009) http://www.rural21.com/165.html
- Brockhaus, M., Djoudi, H. Adaptation at the Interface of Forest Ecosystem Goods and Services and Livestock Production Systems in Northern Mali, CIFOR Info Brief No.19
http://www.cifor.cgiar.org/publications/pdf_files/Infobrief/019-infobrief.pdf
- Kalame, F.B., Idinobba, M., Brockhaus, M., Nkem, J. 2008. Forest policies and forest resource flow in Ghana, Burkina Faso and Mali. Conflicting or consistent for adaptation to climate change? CIFOR Brief TroFCCA Brief No.1
http://www.cifor.cgiar.org/trofcca/attachment/03%20Policy%20Brief%20NEW%20E1.pdf
- Nkem, J., Idinobba, M., Brockhaus, M., Kalame, F.B., Tas, A., Adaptation to Climate Change in Africa: Synergies with biodiversity and forests. Contribution to the scoping paper on adaptation in Africa prepared by SEI and UNEP for the African Ministerial Conference on Environment (AMCEN) 2008. http://wikiadapt.org/index.php?title-Adaptation_and_biodiversity_synergies
- Brockhaus, M., Kambire, H. Gouvernance Locale: Des opportunités et des limites à une adaptation effective dans la domaine du changement climatiques et des biens et services de l'écosystème forestier (workshop report)
http://www.cifor.cgiar.org/trofcca/africa/docs/De_Gaoua_FINAL.pdf
- Locatelli, B., Herawati, H., Brockhaus, M. and Kanninen M., 2008. Methods and Tools for Assessing the Vulnerability of Forests and People to Climate Change: An Introduction. CIFOR Working Paper, December 2008.

Project Title:
Improving field resistance of wheat against Fusarium Head Blight and mitigating the amount of mycotoxin in the grain

Project Coordinator:
(PostDoc) Dr. Norbert Schlang (Leading Scientist: Dr. Etienne Duveiller, Head Plant Pathology, CIMMYT)

Project Coordinator email:
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Partner Institute:
University of Bonn - Institute of Crop Science and Resource Conservation, Department of Phytomedicine; Dr. Erich-Christian Oerke

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Collaborating Institutions:
Not available

Region:
Central America

Country:
Mexico

Thematic Priority:
Not available

Major Research Domain:
Resistance breeding, fungi characterization, mycotoxins, digital infrared thermography

Budget:
200,499 €

Goal:
Not available

Purpose:
Not available

Outputs:
Not available

Major Results Achieved:
Not available

Publications:
Not available

Project Title:
Developing and disseminating stress tolerant maize for sustainable food security in eastern and central Africa

Project Coordinator:
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Partner Institute:
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Collaborating Institutions:
9 national agricultural research systems (NARS) in East and Central Africa;
Non-governmental organizations (NGOs), including CARE-Kenya and the Catholic Relief Services;
Community Based Organizations (CBOs) in Uganda
Small local seed companies including Western Seed Company and Freshco (Kenya), Tanseed (Tanzania), Ethiopian Seed Enterprise (Ethiopia), and FICA (Uganda)

Region:
Central Africa, East Africa

Country:
Ethiopia, Kenya, Tanzania, Uganda

Thematic Priority:
Tolerance to selected abiotic stresses

Major Research Domain:
maize, stress tolerance, drought tolerance, tolerance to low soil fertility, certified seed production

Budget:
1,000,000 €

Goal:
Enhance food and income security and improve human nutrition of resource-poor farming families and consumers in East and Central Africa

Purpose:
To provide a larger number of small-holder farmers in East and Central Africa region with sustainable access to seed of improved stress tolerant and nutritionally enhanced maize varieties that offer significantly greater yields and yield stability under conditions of drought, low soil fertility and Striga

Outputs:
- Greater number of cultivar releases of abiotic stress tolerant, nutritionally enhanced maize varieties and hybrids adapted to the most important agro-ecologies of East and Central Africa
- Accelerated development of new stress tolerant maize cultivars

- Increased availability of breeder and foundation seed of stress tolerant, nutrionally enhanced maize varieties and mechanisms for scaling up certified seed production in particular to stress prone-environments
- Policy recommendations which increase maize seed availability in stress-prone environments

Major Results Achieved:
not yet available

Publications:
Not available

Project Title:
Novel resistance to control wheat blast caused by Magnapothe grisea, a new disease threatening global wheat production

Project Coordinator:
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E.Duveiller@cgiar.org

Partner Institute:
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Collaborating Institutions:
none

Region:
South America

Country:
Bolivia, Brazil, Paraguay

Thematic Priority:
Not available

Major Research Domain:
Phytopathology, resistance breeding, genetic diversity

Budget:
60,000 €

Goal:
To identify novel genetic resistance in wheat against blast and make it available to NARS

Purpose:
To limit the risk of spread of this threat to global wheat production

Outputs:
- CIMMYT novel germplasm made avaiable to Southern Cone region
- Mechanism of resistance to wheat blast further clarified
- Resistance wheat materials identified

Major Results Achieved:
800 lines from the CIMMYT wheat germplasm bank including novel materials resulting from crosses with wild wheat relatives and wheat materials grown in other parts of the world have been made available for testing through the Brazilian partner. A collection of diseased wheat samples was received from several locations in Bolivia and Paraguay where the disease is widespread. The diseased wheat tissues, leaves, stems, ears and grains, were exhibited to standard isolation procedures in order to obtain isolates of Magnaporthe grisea. Based on the findings that M. grisea occurred in the inner parts of grains, the hypothesis of seed transmission of the disease will be studied. Information on perceived risk of disease severity

and occurrence was summarized. The locations were geo-referenced and incorporated into a geographical information systems (GIS) framework. A preliminary climate similarity approach was undertaken to map risk areas in other continents. The study showed that according to information obtained in South America, climatic conditions appear suitable for wheat blast to establish in other continents.

Publications:
none so far

Project Title:
Abiotic stress tolerant maize for increasing income and food security among the poor in eastern India and Bangladesh

Project Coordinator:
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Collaborating Institutions:
Rajendra Agricultural University, Maharana PratapUniversity of Agricultural, Tech in India, Yunbi Xu

Region:
South Asia

Country:
Bangladesh, India

Thematic Priority:
Tolerance to selected abiotic stresses
Rural institutions and their governance

Major Research Domain:
- abiotic stress
- quality protein maize
- drought tolerance
- water-logging tolerance

Budget:
1,000,000 €

Goal:
To enhance food and income security of resource-poor farming families and consumers in India and Bangladesh

Purpose:
To provide poor farmers with stress-tolerant, short-duration maize varieties with improved protein quality that offer crop diversification and intensification options, greater yields under conditions of water shortage and waterlogging,and improved nutritional value as livestock feed and human food

Outputs:
- Waterlogging and drought-tolerant maize with high-quality protein developed, with associated managment technologies for enhanced establishment in wet soils
- Genes associated with water-logging tolerance will be mapped to facilitate marker-assisted selection for increased breeding efficiency
- A biophysical & socio-economic assessment of the constraints and opportunities for

expansion of maize production in India and Bangladesh, resulting in policy recommendations to improve pro-poor targeting and adoption of technologies
- Delineation of maize target environments for breeding and development of efficient selection strategies for stressful environments
- Strengthening capacity of South Asian breeding programs and local seed companies to serve stressful maize production environments

Major Results Achieved:
not yet available (new project)

Publications:
Not available

Project Title:
Precision phenotyping for improving drought stress tolerant maize in southern Asia and eastern Africa

Project Coordinator:
Jose Luis Araus (maize physiologist and project coordinator)

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Partner Institute:
Dr. Juan Manuel Montes, University of Hohenheim Institute of Plant Breeding; Drs. Arthur Gessler and Juan Pedro Ferrio University of Freiburg

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Collaborating Institutions:
- Scientists (breeders, agronomists and socio-economists) from KARI (Kenya), NSFCRC (Thailand) and YAAS (China).
- David Hodson, CIMMYT (GIS specialist), Erika Meng, CIMMYT (socioeconomist), Petr Kosina, CI

Nakhon Sawan Field Crops Research Center, Thailand
Yunnan Academy of Agricultural Science, China
Max Planck Institute, Germany
University of Freiburg, Germany

Region:
East Africa, South Asia

Country:
Not available

Thematic Priority:
Tolerance to selected abiotic stresses
Rural institutions and their governance

Major Research Domain:
drought stress tolerant maize, precision phentotyping

Budget:
1,200,000 €

Goal:
to enhance food security and raise incomes of resource-poor farming families and consumers in southern Asia (Thailand and South China) and eastern Africa (Kenya).

Purpose:
To provide poor farmers with abiotic stress (mainly drought and low fertility) tolerant quality protein maize and breeders of national programs and seed companies with innovative phenotyping platforms to assess genotypic variability in drought adaptation and water use in field trials

Outputs:
1. Identification of accurate secondary ecophysiological and metabolic traits to select maize better adapted to drought a low fertility condition in different mega-environments of southern Asia and eastern Africa.

2. Appropriate techniques/protocols for the evaluation of traits developed and/or refined. The most suited methodologies (particularly low-cost easy to handle) transferred to NARS involved in this project.

3. An analysis of G x E interactions and the development of selection indices using combinations of traits.
4. Genes associated with drought tolerance will be mapped to facilitate marker-assisted selection for increased breeding efficiency.

5. Strengthening capacity of southern Asia and eastern Africa breeding programs and local seed companies to serve stressful maize production environments: National program and private sector scientists will receive training in breeding methods and crop management strategies that are appropriate for target environments affected by drought, and where the window for successful crop establishment is narrow.

Major Results Achieved:
not yet available

Publications:
Not available

Project Title:
Improving minimum tillage systems for potato production in winter fallow paddy soils in southern China

Project Coordinator:
Andreas Oswald, Integrated Crop Management Expert, Int. Potato Center, La Molina, Lima, Peru

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Partner Institute:
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Partner Institute email:
Not available

Collaborating Institutions:
Not available

Region:
ASIA

Country:
PR China

Thematic Priority:
Not available

Major Research Domain:
Soil conservation, agronomy

Budget:
60,000 €

Goal:
To study and improve the productivity of farmer-developed minimum tillage systems for potato on paddy rice soils, and to evaluate its potential for out-scaling to South East Asia.

Purpose:
The minimum tillage system for potato on paddy rice soils has great potential for producing an additional crop within a relatively short period of time, thereby optimizing use of available resources. However, with the exception of Chinese agricultural literature, this system has not been described and analyzed. Furthermore, several constraints ? including the amount of straw required ? limit the system's productivity and adaptability. Tackling these contraints ? for example, by reducing the amount of straw needed for potato production ? would decrease the system's production costs, make it less dependent on input, and enhance its flexibility, thereby enabling it to be applied to more land.

Therefore, the purpose of the project is to:
- analyze and evaluate agronomic and socio-economic factors relevant to the productivity of the minimum tillage system;
- develop technologies to reduce the use of rice straw in potato production and/or

technologies to improve fertilizer use efficiency;
- develop training materials and documentation to diffuse technologies to countries/regions with similar environmental conditions.

Outputs:
- opportunities and constraints of minimum tillage systems with respect to rice – potato rotations evaluated and analyzed;
- technologies developed to reduce the use of rice straw and improve fertilizer use efficiency (without compromising productivity),thereby increasing the economic viability of minimum tillage systems for potato production;
- training materials for technology diffusion developed and distributed;

Major Results Achieved:
not yet available (new project)

Publications:
Not available

Project Title:
Participatory development and testing of strategies to reduce climate vulnerability of poor farm households in East Africa through innovations in potato and sweet potato technologies and enabling policies (CLIMATE CHANGE)

Project Coordinator:
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Collaborating Institutions:
Kenya Ag. Res. Inst. (KARI), Kenya;
Makerere Univ. (MU) Uganda;
Ethiopian Inst. of Ag. Res. (EIAR);
Wageningen Univ., the Netherlands;
International Livestock Res. Inst. (ILRI), Kenya;

Region:
East Africa, Europe

Country:
Germany, Kenya, Netherlands, Uganda

Thematic Priority:
Not available

Major Research Domain:
Potatoes, sweet potatoes, trade-off analysis (TOA), participatory impact pathway analysis (PIPA)

Budget:
1,149,990 €

Goal:
Reduce climate vulnerability of poor farm households in East Africa through adoption of potato- and sweet potato-based technologies and enabling policies that increase the resilience and sustainability of agricultural systems

Purpose:
Adaptation strategies for poor farm households in East Africa based on new potato and sweet potato technologies and enabling policies are adopted by farmers and other stakeholders

Outputs:
- Regionally-specific technology and policy strategies to reduce vulnerability of poor farm households to climate change
- Enhanced national and international capacity to utilize new research methods for analyzing

impacts of technologies and policies affecting farmers' adaptation to climate change
- Policy impact pathways identified and actual and expected policy changes assessed

Major Results Achieved:
not yet available (new project)

Publications:
Not available

Project Title:
Implementing ecological approaches of pest management for enhancing sustainable potato production of resource-poor farmers in mountainous regions in CIP's target countries of Southwest-Central Asia

Project Coordinator:
Dr. Jürgen Kroschel, Project leader and Head Agroecology/IPM, CIP-Lima, Peru.
Dr. Marc Sporleder, Entomologist, CIP/ICIMOD-Katmandu, Nepal.

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Partner Institute:
Prof. Dr. Zebitz, Applied Entomology, University of Hohenheim, Germany;
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Collaborating Institutions:
Dr. Sarath Ilangantileke, CIP-Regional Leader for South West Central Asia, India.
D. Sambu, Coordinator Nat. Potato Develop. Program, Nepal Agric. Res. Council, Nepal.
Dr. Walter Roder, Project leader, CIP-Bhutan Potato Development Program, Bhutan.
Dr. Mohamad Hossain, Senior Scientist Crop Protection, Tuber Crops Research Institute, Bangladesh.

Region:
Southwest Asia

Country:
Bangladesh, Bhutan, Nepal

Thematic Priority:
Not available

Major Research Domain:
Agroecology, potato IPM, biological control, life table studies, insect modeling

Budget:
60,000 €

Goal:
Enhance food security, reduce poverty and improve human health through sustainable crop production and reduced use of toxic pesticides

Purpose:
PTM losses reduced under the control threshold by introduced parasitoids

Outputs:
- Pest infestation, damage and current control measures studied
- Inventory of insect species/communities in potato systems and occurrence and efficacy of local natural enemies on PTM control assessed
- Complementary parasitoids of PTM studied, phenology models developed, parasitoids introduced according to the FAO "Code of Conduct for the import and release of exotic biological control agents", released and monitored

Major Results Achieved:
A survey that aims at improving understanding of potato production systems in the three project countries (Bangladesh, Bhutan, Nepal) and the primary pests and diseases that are causing problems for farmers in different regions and agroecologies was planned. A questionnaire has been developed with Nepalese partners for key informants and group discussions. The survey has been completed in 4 districts in Nepal using rapid rural appraisal. Additionally, a questionnaire for pesticide users has been prepared to evaluate farmers' knowledge, attitudes and practices on pesticide use and the safety procedures they adopt. Selection of study sites to monitor fauna abundance is ongoing. A phenology model the encyrtid wasp Copidosoma koehleri, a Potato Tuber Moth parasitoid, has been completed. The braconid wasps, Apanteles subandinus and Orgilus lepidus, were imported from Australia and rearing of O. lepidus has been successfully installed in CIP's laboratories.

Publications:
- Sporleder, M., Lopez Cobeñas, E.J., Cañedo, V., Chavez, D., Kroschel, J. (2007) Temperature-dependent development of Copidosoma koehleri Blanchard (Hymenoptera: Encyrtidae) as a parasitoid of the potato tuber moth (Lepidoptera: Gelechiidae): implications for field synchrony of parasitoid and host. 31 pages, Working Paper No. 1-2007 (Agroecology Group, Division 4), International Potato Center (CIP), Lima

Project Title:
Enhanced food and income security in SWCA through potato varieties with improve tolerance to abiotic stress

Project Coordinator:
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Partner Institute:
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Collaborating Institutions:
Institute of Plant Physiology & Genetics (Tajikistan)
Horticulture Institute (Uzbekistan)
Institute of Bioorganic Chemistry (Uzbekistan)
Academy of Sciences (Uzbekistan)
Institute of Vegetables, Melon & Potato (Uzbekistan)
Tuber Crops Res. Institute (Bangladesh)
Agriculture Res. Institute (Bangladesh)
Orissa University of Argicultural & Technology (India)
National Argicultural Res. Council (Pakistan)
Ayub Argicultural Res. Institute (Pakistan)

Region:
Central Asia and the Caucasus, Southwest Asia

Country:
Armenia, Azerbaijan, Georgia, Kyrgyzstan, Tajikistan, Uzbekistan

Thematic Priority:
Conservation and efficient use of natural resources and biodiversity
Tolerance to selected abiotic stresses
Rural institutions and their governance

Major Research Domain:
- stress tolerant potato varieties
- abiotic stress
- drought stress
- heat stress
- salt stress
- plant grouth models

Budget:
1,000,000 €

Goal:
To increaswe food and income security of resource-poor farmers in SWCA by reducing their vulnerability to abiotic stresses affecting crop production

Purpose:
Farmers, extension services and policy makers use stress tolerant potato varieties in resilent cropping systems supported by crop growth models and risk area mapping for abiotic stress

Outputs:
- Improved access of smallholder farmers to new potato varieties adapted to stress-prone environments
- Profitable, early-maturing potato varieties adapted to stress-prone environments and cropping systems developed, identified and exchanged
- Plant growth models and screening methods for key traits of abiotic stress tolerance adapted and applied for stress tolerance breeding and germplasm enhancement
- Dynamic maps and models depicting and characterizing abiotic stress-prone agroecologies at present and under future climate change scenarios in use at NARS, regional governments and extension services
- Stress tolerance traits and genes identified and combined in new biodiverse parental material
- Enhanced national and international capacity for impact from crop improvement research

Major Results Achieved:
not yet available (new project)

Publications:
Not available

Project Title:
Agricultural Policies in Africa: Understanding the Political and Institutional Dynamics of the Comprehensive Africa Agriculture Development Programme (CAADP)

Project Coordinator:
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Partner Institute:
Not available

Partner Institute email:
Not available

Collaborating Institutions:
CAADP - The Comprehensive Africa Agriculture Development Programme

Region:
Sub-Saharan Africa (SSA)

Country:
Ghana, Kenya, Uganda

Thematic Priority:
Not available

Major Research Domain:
Africa, CAADP, Agricultural policy, NEPAD, political economy; multi-level policy analysis

Budget:
59,967 €

Goal:
The project will analyse the multi-level dimension of the Comprehensive Africa Agriculture Development Programme (CAADP) in order to understand its political and institutional dynamics. It will explore the different interests in and perceptions of CAADP by different actors and show how these differences hamper its implementation and performance. Based on this analysis, the project will develop recommendations for both African and development partners on how to improve CAADP's policy making process. The analysis will help CAADP to reach ist stated goals.

Purpose:
This project is intended to complement an ongoing DIE-IFPRI-study. Whereas the ongoing study focuses on the analysis of CAADP at the national level, this project will focus on CAADP at regional and continental level, because CAADP framework is developed at the continental level, to be implemented at the regional and national levels. The ongoing project has shown that there are a lot of challenges facing CAADP including the lack of political willingness in the countries to implement CAADP framework. This exhibits a lack of national ownership and serious problems between different levels of CAADP. In order to understand these challenges, it is imperative to examine how CAADP framework is designed and implemented at different levels, and to analyse the role that different stakeholders play at different levels.

Outputs:
The slow implementation and hence weak impact of CAADP, despite expressed commitments from high ranking officials in both developed and developing countries, need to be understood. Until now, there is very little scientific information available about the design and implementation of CAADP's framework, its governance structure across different levels (continental, regional, and national), and the perceptions of different stakeholders involved in the process.
Therefore, the objective of the proposed research project aims to understand the institutional and political dimension, interests and perceptions at different policy levels that shape the design, implementation and achievements of CAADP. Based on this analysis, the project will develop recommendations for African and development partners on how to improve CAADP and external support to achieve its stated goals.

Major Results Achieved:
not yet available (new project)

Publications:
Not available

Project Title:
Developing drought and heat tolerance wheat germplasm and its utilisation for the drylands of Central and West Asia and North Africa

Project Coordinator:
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Collaborating Institutions:
Agricultural Research Centre (ARC), Sudan
Institut National de la Recherche Agronomique (INRA), Algeria
General Commission for Scientific Agriculturale Research (GCSAR), Syria

Region:
Central and Western Asia and North Africa (CWANA)

Country:
Algeria, Mexico, Sudan, Syria, Turkey

Thematic Priority:
Sustainable increase in productivity
Conservation and efficient use of natural resources and biodiversity

Major Research Domain:
- wheat
- abiotic stress
- drought tolerance
- heat tolerance
- molecular maps

Budget:
999,980 €

Goal:
To enhance the tolerance of wheat to drought and heat in the Mediterranean region in order to improve wheat productivity in the dryland and reduce risks in unfavorable agricultural environments

Purpose:
Phenotypic and genotypic evaluation of drought and heat response in wheat germplasm und controlled and field conditions

Outputs:
- Drought and heat responses characterized under field conditions
- Promising durum and bread wheat lines characterised with drought /heat candidate genes and SSRs/DArT
- QTL map developed
- Existing mapping population will be phenotyped to further identify QTLs
- Pyramiding of genes using DH (bread wheat) and MAS (durum)
- Wheat germplasm evaluated by partner NARS in collaboration with resource poor farmers

Major Results Achieved:
not yet available (new projekt)

Publications:
Not available

Project Title:
Evaluation and application of advanced tools for molecular breeding for drought and salinity tolerance in chickpea

Project Coordinator:
Dr. Michael Baum, Biotechnologist (German national), ICARDA
Co-investigator: Dr. Imtiaz Muhammad, Chickpea Breeder/Geneticist, ICARDA

Project Coordinator email:
Not available

Partner Institute:
Johann-Wolfgang-Goethe-Universität Frankfurt, Biocenter, Max-von-Laue-Str.9, D-60438 Frankfurt, Germany. Contact: Prof. Dr. Günter Kahl. Area of cooperation: evaluation of assays for predicting drought- and salinity-tolerance in chickpea.

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Collaborating Institutions:
Not available

Region:
ASIA

Country:
Syria

Thematic Priority:
Not available

Major Research Domain:
Chickpea (Cicer arietinum), salt and drought tolerance, transcription profiling, qRT-PCR, germplasm screening, expression mapping, eQTL

Budget:
59,980 €

Goal:
This project aims at evaluating novel tools for molecular breeding to facilitate the rapid development of new varieties with enhanced terminal drought and salinity tolerance. Direct beneficiaries of the project are molecular breeders and physiologists at ICARDA, and national agriculture research systems (NARS) scientists. They will gain access to and training in the use of an innovative, easily applicable and reliable technology that, nevertheless, is highly informative and may have extreme power for predicting dehydration-stress-responses in germplasm and breeding lines.

Purpose:
GenXPress (TaqMan) assays enable to profile the expression of a particular transcript with utmost reliability and sensitivity within less than 4 h, and are easily performed in 96- or 384-well microtiter-plates on minute amounts of RNA (~5ng) at approx. 3.6 Euros per sample. Data are recorded by the machine software: gel running, staining, photography and manual data calling are avoided. Moreover, these assays are informative in the absence of DNA-polymorphisms which is important for practical application in breeding of long-time domesticated crops with notoriously monotonous genomes such as chickpea. Thus, qRT-

PCR assays could be ideal tools for every-day application in breeding. If we could confirm the first results of transcription profiling using the assays to predict stress-responses in selected, well characterized germplasm and in segregating populations, eventually even without submitting the plants to the stress, completely new, knowledge-based breeding strategies could be developed and operated by ICARDA and NARS within their technical and financial limits. Further, the successful completion of the project would provide target genes for molecular introgression of dehydration-tolerance into elite, high-yielding varieties that are, nevertheless, often susceptible to drought and salinity. Thus, qRT-PCR assays evaluated for their predictive power would be immediately implemented into standard germplasm screening and breeding programs.

Outputs:
(1) TaqMan assays evaluated for predicting drought- and salinity-tolerance in chickpea germplasm and segregating populations
(2) Best suitable strategy developed for their use in the breeding program
(3) Expression (e)QTL for drought tolerance in intraspecific populations for which a genetic map already exist and for salinity in early generation
(4) Proof-of-principle of novel concepts and functional genomics tools for breeding for stress-tolerant crops

Major Results Achieved:
not yet available - new project

Publications:
Not available

Project Title:
Development of conservation agriculture technologies for adoption by smallholders in Central Asia

Project Coordinator:
(PostDoc) Christopher Martius, Regional Coordinator for Central Asia and the Caucasus, ICARDA

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Partner Institute:
Center for Development Research (ZEF), University of Bonn, Prof. Paul Vlek, (advisor nutrient management); Dr. John Lamers (advisor for Khorezm)

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Collaborating Institutions:
University of Würzburg, Dr. Christopher Conrad

Region:
Central Asia and the Caucasus

Country:
Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan

Thematic Priority:
Not available

Major Research Domain:
Conservation agriculture, sustainable land use, alternative crop rotations, fertilizer management, crop modeling, economic cost/benefit analysis, poverty reduction

Budget:
214,352 €

Goal:
Improved resource use efficiency and rural livelihoods in the five countries of Central Asia (Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan and Turkmenistan) through the adoption by farmers of conservation agricultural technologies that support crop diversification and sustainable nutrient management.

Purpose:
- Alternative crop rotations to ease the competition for crop residues by identifying suitable crops according to agro-ecological conditions and farmers' preferences
- Understand effect of irrigated conservation agriculture on nutrient dynamics and crop growth
- Increase economic opportunities by diversified agriculture for smallholders in vulnerable areas
- Strengthen the NARS cooperation and partnership the interface/gateway between their research and outreach

Outputs:
- Adoption of conservation agriculture increased by smallholders
- Recommendations for crop rotation within the conservation agriculture system including suitable crops for livestock feed and residue retention
- Fertilizer management recommendations for mixed conservation agriculture systems developed based on field experiments and crop modeling
- Demonstration fields for showing best practices and integrated farm management
- Presentations, seminars and training unit for decision makers, resource managers, farmers and smallholders

Major Results Achieved:
not yet available (new project)

Publications:
Not available

Project Title:
Economic impact assessment as a decision-making tool for resource allocation in horticultural research in East Africa

Project Coordinator:
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University of Hannover: Faculty of Economics and Management

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Collaborating Institutions:
Kenya: Ministry of Agriculture and Rural Development, Horticulture Division;
Egerton University, Department of Agricultural Economics

Region:
East Africa, Europe

Country:
Germany, Kenya

Thematic Priority:
Development of sustainable production systems
Strengthening institutions and improving policy development

Major Research Domain:
economic impact assessment, vegetable production, horticulture, integrated pest management

Budget:
499,675 €

Goal:
Contribute to sustainable vegetable production in Africa

Purpose:
Develop a policy framework for sustainable vegetable production and improve resource allocation in horticultural research in East Africa

Outputs:
- Cost-benefit analysis of crop management practices of the small-scale horticultural sector in Kenya
- Assessment of the socioeconomic impact of the technologies developed by ICIPE for sustainable on horticultural production, incl. biological control methods
- Broaden the analysis from the micro level to the political frame conditions
- Design the policy framework, which will assist in the implementation and further diffusion on environmentally sustainable and less health-hazardous horticultural production

Major Results Achieved:
Studies on current production practises related to high-value crops in Kenya were conducted. Results showed that farmers producing vegetables for the domestic market used significantly less pesticides than do export farmers. Adopters of the GLOBALGAP food safety standard used safer pesticides based on WHO classification. Adoption of standards had a positive and significant impact on revenue from vegetable production. Pesticide ascribed incidence of acute illness symptoms and its associated cost of illness significantly decreased with adoption of standards. Likewise, adoption of standards had a significant positive impact on improved crop management and pesticide handling practices. GLOBALGAP certification had a positive impact on farm worker welfare since it positively influenced the amount of training a worker received. At the same time, certification did not translate into higher wages or better health. With the adoption of Farmer Field Schools (FFS) and Common Interest Groups (CIG) as source of information in horticultural production, it is not yet clear how effectively the two approaches enhance environmentally and health friendly production practices with regard to integrated pest management (IPM). Survey results suggested that little good quality knowledge on IPM and pesticide handling is integrated into public extension systems. A study on potential risks and impacts of pesticide use in the vegetable sub sector in Kenya was conducted; analysis of results is ongoing. A Workshop on Pesticide Negative Externalities in the Vegetable Sub Sector in Kenya was held at icipe. During the workshop an expert survey was conducted which confirmed that pesticide use in the Kenyan vegetable production system causes negative effects on beneficial insects, human health and water quality. Recommendations of the expert survey were: effective awareness creation amongst farmers, effective policies for control of pesticide use and stiff penalties for misuse as well as regular monitoring.

Comment:
As an additional output and since economic research on horticultural production and marketing is limited a book is planned based on workshop contributions. This book is anticipated to be completed during no-cost-extension II, which ends on December 31, 2009.

Publications:
- Asfaw, S. (2008): Global Agrifood Supply Chain, EU Food-safety Standards and African Small-scale Producers: The Case of High-value Horticultural Export from Kenya. Pesticide Policy Project Publication Series No. 13. (Thesis Institute of Agriculture and Development Economics, Faculty of Economics, Leibniz University of Hannover, Germany)
- Asfaw, S., Mithöfer, D. and Waibel, H. (2007). Investment in EU Private Food-safety Standards Compliance: Does it Pay Off for Small-Scale Producers in Sub-Saharan Africa? Submitted to European Journal of Development Research.
- Asfaw, S., Mithöfer, D. and Waibel, H. (2008, a). Food-safety Standards: A Catalyst for the Winners - a Barrier for the Losers? The case of GlobalGAP in Horticultural Export from KenyaIIED Fresh Perspectives 18. Agrifood standards and pro-poor growth in Africa. http://www.agrifoodstandards.net/en/global/fresh_perspectives.html.
- Asfaw, S., Mithöfer, D. and Waibel, H. (accepted). EU Food-safety Standards, Pesticide Use and Farm Level Productivity: The Case of High-value Crops in Kenya. Journal of Agricultural Economics.
- Asfaw, S., Mithöfer, D. and Waibel, H. (in press). What Impact Are EU Supermarket Standards Having on Developing Countries Export of High-Value Horticultural Products? Evidence from Kenya. Journal of International Food and Agribusiness Marketing (anticipated date of publication: early 2010).
- Asfaw, S., Mithöfer, D. and Waibel, H. (under review). Food-safety Standards and Farmers Health: Evidence from Kenyan’s Export Vegetable Growers. Submitted to the 27th International Conference of Agricultural Economists, August 16-22, 2009, Beijing, China.
- Asfaw, S., Mithöfer, D. and Waibel, H. (unpublished). Health and Environmental Impact of EU Private-sector Standards: Evidence from Kenyan's Export Vegetable Growers. Working Paper, Faculty of Economics and Business Administration, University of Hannover, Germany and icipe, Nairobi, Kenya
- Asfaw, S., Mithöfer, D. and Waibel, H. Do Small-scale Producers Benefit from Complying with EU Private Food-safety Standards? Evidence from Vegetable Export from Kenya.

Working Paper, University of Hannover, Germany. To be submitted to World Development.
- Asfaw, S., Mithöfer, D., Waibel, H. (2008, b). EU private agrifood standards in African high-value crops: pesticide use and farm-level productivity. Contributed Paper, 12th Congress of the European Association of Agricultural Economists. August 26-29, 2008. Gent Belgium.
- Bekele, N., Mithöfer, D. Amudavi, D. and Obare, G. (under review). Information sources and factors influencing access among horticulture farmers about integrated pest management in Kenya. Submitted to the 27th International Conference of Agricultural Economists, August 16-22, 2009, Beijing, China.
- Ehlert, C. (2007). Food Safety Standards and Farm Workers Welfare in Kenya. MSc Thesis, Faculty of Economics and Business Administration, University of Hannover, Germany.
- Ehlert, C. Mithöfer, D. and Waibel, H. (unpublished). Food Production Standards, Farm Size and Farm Worker Welfare in Kenya. Working Paper, Faculty of Economics and Business Administration, University of Hannover, Germany and icipe, Nairobi, Kenya.
- icipe (2008). Pesticide Negative Externalities in the Vegetable Sub Sector in Kenya. Workshop Report. Workshop held at icipe, September 15-16, 2008.
- König, T., Blatt, J., Brakel, K., Kloss, K., Nilges, T., Woellert, F., Pletziger, S. and Mithöfer, D. (2008). Regional Trade and Commercialization of Horticultural Production as an Opportunity for Poverty Reduction: The Case of Vegetables in Kenya and Tanzania. 8th International Conference on Management in AgriFood Chains and Networks. May 28-30, Ede, The Netherlands.
- Macharia, I., Mithöfer, D., Waibel. H. (2008). Potential negative externalities of pesticide use in vegetable production in Kenya. In: Proceedings of the seventh Workshop on Sustainable Horticultural Production in the Tropics. University of Nairobi, November 28 - December 1, 2007, Nairobi, Kenya (in press).
- Mausch, K. (2007). Do EurepGAP Standards favour Large-scale Vegetable Producers in Kenya? MSc Thesis, Faculty of Economics and Business Administration, University of Hannover, Germany.
- Mausch, K., Mithöfer, D. Asfaw, S., Waibel H. (2007). Vegetable production in Kenya under EurepGAP standard: Is large “more beautiful” than small? Submitted to Journal of Food Distribution Research.
- Mausch, K., Mithöfer, D., Asfaw, S. and Waibel, H. (2006). Impact of EurepGAP Standard in Kenya: Comparing Smallholders to Large-scale Vegetable Producers. In: Proceedings of the ‘Tropentag’, Conference on International Research on Food Security, Natural Resource Management and Rural Development “Prosperity and Poverty in a Globalized World – Challenges for Agricultural Research”, October 11 - 13, 2006, University of Bonn, Bonn.
- Mithöfer, D. (2008). Linking smallholders to high-value crop markets: how does the group approach work? IIED Fresh Perspectives 25. Agrifood standards and pro-poor growth in Africa. http://www.agrifoodstandards.net/en/global/fresh_perspectives.html.
- Mithöfer, D., Asfaw, S., Ehlert, C., Mausch, K., and Waibel, H. (2007). Economic impact of EurepGAP standard on small to large scale producers and farm worker welfare in Kenya. Paper presented at the Regional Workshop “Good Agriculture Practices in Eastern and Southern Africa: Practices and Policies”. Organised by FAO, UNCTAD and the Kenyan National Task Force on Horticulture. Held at KEPHIS, Nairobi, Kenya, 6 - 9 March 2007. In: FAO and UNCTAD, 2007, Annex 5.
- Mithöfer, D., Nang’ole, E. and Asfaw, S. (2006). EUREPGAP certification and market linkage of small-scale export vegetable producers in Central and Eastern Province, Kenya. Internal Report, Horticulture Division, ICIPE. Submitted to the National Task Force on Horticulture, Kenya.
- Mithöfer, D., Nang’ole, E. and Asfaw, S. (2008). Smallholder access to the export market: the case of vegetables in Kenya. Outlook on Agriculture 37(3): 203-211.
- Paalhaar, J. (2007). The influences of group culture on the participation in the export market: A case study of farmer groups producing for the horticultural export market in Kenya. MSc Thesis, Technology and Agrarian Development Group, Department of Social Sciences, Wageningen University, The Netherlands.

Project Title:
Tackling Liriomyza leafmining flies: invasive pests of global proportions

Project Coordinator:
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University of Hohenheim, Germany

Partner Institute email:
Not available

Collaborating Institutions:
Argentina: University of Cordoba

China: Zhejiang University, Hanghzou

Kenia: Fresh Produce Exporters` Association of Kenya

Peru:
Instituto Rural Valle Grande, Canete
Canete Farmer Association
Canete Public Agricultural Institute

Region:
East Africa

Country:
Kenya

Thematic Priority:
Development of sustainable production systems

Major Research Domain:
leafmines, liriomyza, biological control, parasitoids, metarhizium

Budget:
1,149,410 €

Goal:
Enhance food security and reduce poverty through sustainable crop production

Purpose:
Pest status of leaf-mining flies greatly reduced by introduced exotic parasitoids and other environmentally friendly control methods

Outputs:
- Liriomyza spp. distribution, damage and control measures established in Kenya
- Role of local natural enemies in Kenya assessed
- Complementary parasitoids studied, introduced, and released in Kenya
- Biocontrol-compatible LMF management methods developed

- Impact assessment of project activities initiated
- Technology transfer & training prgramme initiated with national partners

Major Results Achieved:
Major activities were limited to project organization and negotiations with Peruvian authorities concerned with biodiversity legislation and management issues. The life cycle of the parasitoid Halticoptera arduine, a promising biocontrol candidate, was studied in Peru. Landscape effect on pests, parasitoids and predator insect community were determined in Peru, too. Export permits for three leafminer fly parasitoids (Halticoptera arduine, Phaedrotoma scabriventris and C. flacilla) have been obtained. The project is investigating different formulations of the entomopathogenic fungus Paecilomyces fumosoroseus, isolated in Peru to increase its viability under field conditions. Apart from this, a review of the evolutionary history of Agromyzidae in Africa and its implication for parasitoid efficiency under a biocontrol concept has been completed. Findings indicate that Agromyzidae diversity in the Afro-tropical region is much reduced compared to other regions. A total of 42 parasitoid species including introduced species are associated with agromyzids in this region. Larval infestation of LMF with parasitoids was six times higher in organic compared to conventional fields treated with insecticides. Life cycles of the endoparasitoids Chrysocharis flacilla and Phaedrotoma scabriventris Nixon were studied using the pea leafminer Liriomyza huidobrensis as host. The role of weeds as refugia for LMF and their parasitoids were studied in conventional and organic potato fields. LMF adults exposed to conidial suspensions on treated potato leaves showed high levels of susceptibility to two Paecilomyces fumosoroseus strains (an entomopathogenic fungus). B. bassiana and M. anisopliae were also found to be pathogenic to L. huidobrensis. An economic assessment study of leaf miner damage as well as control strategies in snow peas production started.

Comment:
The process faces serious problems related to legislation in the area of study of and access to biodiversity (i.e. collection, identification and exportation of parasitoids form Peru) as well as with bud-midge infestation in study sites. Both problems appear to pose serious risks to the achievement of the project objectives.

Comment 2008:
Problems related to legislation in the area of collection, identification and exportation of parasitoids form Peru) led to a delay in field activities and postponing of the planned introduction of parasitoids which is now due in June 2008.

Publications:
- Chabi-Olaye, A., Löhr, B. and Kroschel, J. 2008. Role of agroecosystem in the abundance and diversity of Liriomyza leafmining flies and their natural enemies. Abstract submitted to be presented in the International Conference of Entomology, in Durban, South Africa, 6-12 July 2008.
- Ezeta Gabriela (2007). Seasonal occurrence of soil arthropod in organic vs. conventional potato (Solanum tuberosum L.) production in the Cañete valley. Undergraduate thesis, UNALM.
- Maria Cecillia Prudencio Leon, Undergraduate thesis National Agricultural University La Molina, Lima, Peru “Life cycle of the pteromalid Halticoptera arduine, endoparasitoid of Liriomyza huidobrensis in the lowlands of Peru”.
- Musundire, R., Löhr B., Chabi-Olaye, A. and Krüger, K. 2008. Diversity of Agromyzidae and associated parasitoid species in the Afrotropical region (to be submitted).
- Salazar María (2008). Seasonal occurrence of the leafminer fly Liriomyza huidobrensis Blanchard and their parasitoids in organic vs. conventional potato (Solanum tuberosum L.) production in the Cañete valley. Undergraduate thesis.

Project Title:
Development and implementation of a sustainable IPM program for major mango pests and opportunity for improving market information and processing in sub-Saharan Africa

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Not available

Collaborating Institutions:
Kenya:
Ministry of Agriculture, Nairobi;
Kenya Plant Health Inspectorate Service (KEPHIS);
Kenya Agricultural Research Institute (KARI);

Tanzania:
Mikocheni Agricultural Research Institute (MARI);
Ministry of Agriculture & Food Security, Plant Health Service;

Benin:
International Institute of Tropical Agriculture (IITA);
University of Parakou (UP);
Service de Protection des Végétaux (SPV)

Sri Lanka:
Horticultural Crop and Development Institute (HORDI);
Dept. of Zoology, University of Ruhuna

India –SunAgro Biotech Research Centre, Chennai;
Project Directorate for Biological Control, Bangalore;

Region:
East Africa, South Asia, Southern Africa, West Africa

Country:
Benin, India, Kenya, Sri Lanka, Tanzania

Thematic Priority:
Increasing income from fruit and vegetables

Major Research Domain:
IPM, mango pests, mango seed weevil, mango mealy bug, new invasive fruit fly

Budget:
1,050,000 €

Goal:
To enhance food security and income generation capacity in the targeted countries in East and West Africa

Purpose:
To develop and implement in collaboration with international and national partners effective approaches to reduction of mango loses due to insect infestation leading to quality production; and to improve market access and processing to meet the needs of both domestic urban and export markets

Outputs:
- The biology and ecology of the mango seed weevil (S. mangiferae), mango mealy bug (R. iceryoides) and the new invasive fruit fly (B. invadens) elucidated.
- The role of indigenous and exotic natural enemies in suppressing populations of these major mango insect pests determined and promising natural enemies (especially parasitoids) of invasive species identified, tested, and where feasible introduced.
- New technologies and other existing management tools suitable for use by smallholder for controlling mango seed weevil, mealybug and fruit flies identified.
- Capacity building of young Africans initiated with partners.
- Identified and tested exotic natural enemies of B. invadens and mango mealy bug released in the target countries.
- IPM package for improved management of insect pests on mango assembled, validated and implemented by growers, and impact of introduced technologies on biodiversity determined.
- Farmer access to marketing information and processing facilitated.
- Capacity building continued and technology transfer of IPM programme initiated with collaborating partners

Major Results Achieved:
A laboratory rearing method for fruit flies using liquid diet based on yeast was developed. Overall adult emergence from this diet was consistently higher compared to the carrot-based solid diet. Bioecological studies including distribution, abundance, seasonal dynamics and host plant assessment of the target pests: mango seed weevil (MSW), mango mealy bug (MMB) and the new invasive fruit fly Bactrocera invadens were carried out in Benin, Kenya and Tanzania. Microsatellite markers have been successfully applied to B. invadens and other invasive fruit fly species to infer evolutionary aspects underlying their invasive processes and to identify the routes of their colonization. All the populations from Africa seem to be well differentiated; a situation that shows that B. invadens could have been well established before its detection in Africa. Sampling for indigenous natural enemy fauna was conducted in Benin, Kenya and Tanzania. In Tanzania, only one parasitoid species was recorded on MMB. In Kenya, high parasitism of MMB was observed on the wild host Parkinsonia aculeata with a total of seven species of parasitoids and a parasitism index of 62.2%. In Benin one parasitoid species has been recovered from the mango fruit fly C. cosyra (50% parasitism) on a widespread savanna shrub found throughout western Africa. Natural enemy exploration for B. invadens was successfully conducted in Sri Lanka and India. Baseline data on the laboratory performance of two exotic parasitoids introduced from Hawaii are encouraging so far, permits for experimental field releases were granted by the competent authorities of Benin, Kenya and Tanzania and pilot releases were initiated. Evaluation of food baits and field suppression trials showed promising results indicating that baits containing the entomopathogenic fungus Metarhizium anisopliae and different soft insecticides achieved a high level of fruit fly suppression.

Publications:
- Billah M. K., Ekesi S., Hanna R., Goergen G. and Bandara K. A. N. P. (2008) Exploration for natural enemies of Bactrocera invadens—an invasive fruit fly pest in Africa. Paper presented at the First Meeting of Tephritid Workers of Europe, Africa and the Middle East (TEAM. 7–8th April 2008). Mallorca, Spain.
- Boton D., Gnanvossou D., Hanna R. and Sohounhloue D. (2008) Effect of four essential oils

on the behavior of the fruit fly Bactrocera cucurbitae. Paper presented at the INRAB national workshop, 16 December 2008.
- Chang, C.L., Caceres, C. & Ekesi, S. (2007) Life history parameters of Ceratitis capitata on liquid diet. Annals of the Entomological Society of America 100 (6): 900-906
- De Meyer M., Mwatawala M. and Ekesi S. (2008) Bactrocera latifrons: Detection, ecology, management and challenges. Paper presented at the First Meeting of Tephritid Workers of Europe, Africa and the Middle East (TEAM. 7–8th April 2008). Mallorca, Spain.
- Ekesi S. (2008) Fruit fly bioecology and their management. Paper presented at the First Tanzania National Group Training Course on Fruit Fly Management, 15–28 September 2008. Kibaha Biological Control Centre, Kibaha, Tanzania.
- Ekesi S. (2008) Fruit fly species composition in Africa and their management. Paper presented at the Workshop on Integrated Fruit Management Towards Sustainable Fruit Production in Sudan. 27–28th August, 2008. Khartoum, Sudan.
- Ekesi S. and Mohamed S. A. (2008) Bait station evaluation for management of native and invasive fruit fly species in Kenya. Paper presented at the Joint FAO/International Atomic Energy Agency (IAEA) Consultants Group Meeting on Development of Bait Stations for Fruit Fly Suppression, 30 October to 1 November 2008. Mazatlan, Mexico
- Ekesi S., Billah M. K., Nderitu P. W., Lux S. A. and Rwomushana I. (2009) Evidence for competitive displacement of the mango fruit fly, Ceratitis cosyra by the invasive fruit fly, Bactrocera invadens (Diptera: Tephritidae) on mango and mechanisms contributing to the displacement. Journal of Economic Entomology (Accepted).
- Ekesi S., Hanna R., Rwomushana I., Goergen G. and De Meyer M. (2008) Bactrocera invadens: State-of-the-art, challenges and gaps in knowledge—experience from Eastern, Western and Central Africa. Paper presented at the First Meeting of Tephritid Workers of Europe, Africa and the Middle East (TEAM. 7–8th April 2008). Mallorca, Spain.
- Ekesi, S. & Maniania, N.K. (2007) Integration of soil inoculation with Metarhizium anisopliae into bait-based technology for field suppression of Bactrocera invadens on mango. Paper presented at the 40th Annual Meeting of the Society for Invertebrate Pathology and 1st International Forum on Entomopathogenic Nematodes and Symbiotic Bacteria, August 12-16, 2007, Laval University, Quebec City, Canada.
- Ekesi, S. & Maniania, N.K. (2007) Use of Entomopathogenic Fungi in Biological Pest Management. Research SignPost, Kerala. ISBN: 978-81-308-0192-6
- Ekesi, S., Dimbi, S. & Maniania, N.K. (2007) The role of entomopathogenic fungi in the integrated management of tephritid fruit flies (Diptera: Tephritidae) with emphasis on species occurring in Africa. In: Use of Entomopathogenic Fungi in Biological Pest Management (S. Ekesi & N.K. Maniania, Eds.), pp. 239-274. Research SignPost, Kerala
- Ekesi, S., Nderitu, P.W. & Chang, C.L. (2007) Adaptation to and small-scale rearing of the invasive fruit fly Bactrocera invadens (Diptera: Tephritidae) on artificial diet. Annals of the Entomological Society of America 100 (4): 562-567
- Hanna R., Ekesi S. and Gnanvossou D. (2008) Bactrocera cucurbitae: Detection, ecology, management and challenges. Paper presented at the First Meeting of Tephritid Workers of Europe, Africa and the Middle East (TEAM. 7–8th April 2008). Mallorca, Spain.
- Hanna R., Gnanvossou D. and Bokonon-Ganta A. (2008) Integration of biological control in the management of Bactrocera invadens in Africa. Paper presented at the workshop held at the Directorate of Agriculture, 4th November 2008. Porto Novo, Benin.
- Hanna R., Gnanvossou D., Hounmalon G. and Agbaka A. (2008) Evaluation of success for the control of tephritid fruit flies infesting cucurbits in Benin, West Africa. Poster presentation at the First Meeting of the Tephritid Workers of Europe, Africa (TEAM. 7–8th April 2008). Mallorca, Spain.
- Khamis F., Karam N., Guglielmino C. R., Ekesi S., Masiga D., De Meyer M., Kenya E. U. and Malacrida A. R. (2008) Isolation and characterization of microsatellite markers in the newly discovered invasive fruit fly pest in Africa, Bactrocera invadens (Diptera: Tephritidae). Molecular Ecology Resources 8, 1509– 1511.
- Mohamed S. A., Ekesi S. and Hanna R. (2008). Evaluation of the impact of Diachasmimorpha longicaudata on Bactrocera invadens and five African fruit fly species. Journal of Applied Entomology 132: 789-797.
- Mohamed S. A., Ekesi S. and Hanna R. (2008) Laboratory evaluation of parasitism of Bactrocera invadens and five Ceratitis species by the opiine parasitoids Fopius arisanus and

Diachasmimorpha longicaudata. Paper presented at the First Meeting of Tephritid Workers of Europe, Africa and the Middle East (TEAM. 7–8th April 2008). Mallorca, Spain.
- Rwomushana I., Ekesi S., Gordon I. and Ogol C. K. P. O. (2008) Host plants and host plant preference studies for Bactrocera invadens (Diptera: Tephritidae) in Kenya, a new invasive fruit fly species in Africa. Annals of the Entomological Society of America 101, 331–340.
- Rwomushana I., Ekesi S., Ogol C. K.P.O. and Gordon I. (2008). Effect of temperature on development and survival of immature stages of Bactrocera invadens (Diptera: Tephritidae). Journal of Applied Entomology 132: 832-839.

Project Title:
Integrated control of thrips in vegetables in eastern Africa

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Collaborating Institutions:
Kenya Agriculture Research Institute (KARI), Kenya
Horticultural Centre, Kenya
Fresh Produce Exporters´ Association of Kenya, Kenya
Plant Health Division, Kenya
Uganda Martyrs University, Uganda
Leibniz University Hannover, Germany

Region:
East Africa

Country:
Kenya, Uganda

Thematic Priority:
Increasing income from fruit and vegetables

Major Research Domain:
-thrips
- frankliniella occidentalis
- integrated pest management (IPM)
- vegetable production

Budget:
999,973 €

Goal:
Enhance food security and reduce poverty through sustainable crop production

Purpose:
Pest status of thrips greatly reduced by environmentally friendly control methods

Outputs:
- Identity, importance and distribution of major plant infesting thrips studied in Kenya and Uganda.
- Field ecology and dispersion of Frankliniella occidentalis studied on French beans in Kenya.

- Metarhizium-based control product developed.
- Additional environmentally friendly control options tested in the greenhouse and field and IPM strategy developed.
- Technology Transfer & Training program initiated with national partners.

Major Results Achieved:
A survey on the thrips fauna of key vegetables and their associated plants was conducted in twelve districts distributed within five provinces of Kenya and in Kampala, Uganda. Key pest thrips on various vegetables and regional differences in the diversity of the thrips complex have been identified. The important thrips species in terms of abundance, encountered in the survey were onion thrips, western flower thrips (WFT), tomato thrips, Ceratothripoides sp. and bean flower thrips. Predatory thrips (Aeolothrips sp.), parasitoids and pirate bugs were the commonly encountered natural enemies. Green house experiments have been initiated for evaluation of botanical pesticides such as neem, pyrethrum and garlic extracts for the management of WFT. Training on collection, processing and identification of thrips was provided for members from partner institutes, regional universities and grower organizations, technicians and students. Agreements and work plans have been formalized with partners in Uganda and activities initiated. Activities pertaining to field ecology studies, entomopathogens and cultural control of thrips have been initiated with greenhouse and field experiments.

Publications:
- CD-ROM of presentations and discussions at the 1st project planning meeting, July 28th – 29th, 2008, icipe, Nairobi, Kenya
- CD-ROM of presentations and lectures delivered at the thrips taxonomy training program organized by Dr. Gerald Moritz, Martin-Luther University, Germany for stakeholders, July 30th – 31st, icipe, Nairobi, Kenya

Project Title:
Integrated management of major insect pests and diseases of cashew in east and western Africa

Project Coordinator:
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Partner Institute:
(1) Prof. Dr. Stefan Vidal, Georg-August-Universität Göttingen, Department of Crop Sciences, Agricultural Entomology, Grisebachstrasse 6, 37077 Göttingen Germany; (2) Prof. Dr. Andreas von Tiedemann, Georg-August-Universität Göttingen, Department of Crop Sciences, Division of Plant Pathology and Crop Protection, Grisebachstrasse 6, 37077 Göttingen Germany.

Partner Institute email:
Not available

Collaborating Institutions:
Kenya: (1) Kenya: icipe – Prof. C. Borgemeister. Tanzania: (1) Mikocheni Agricultural Research Institute (MARI) – Dr. Z. Seguni; (2) Agricultural Research Institute, Naliendele – Dr. M.E. Sijaona; Sokoine University of Agriculture – Dr. M. Mwatawala. Benin – (1) International Institute of Tropical Agriculture (IITA) – Dr. M. Tamo; (2) University of Parakou (UP) – Dr. A. Onzo.

Region:
East Africa, West Africa

Country:
Benin, Kenya, Tanzania

Thematic Priority:
Increasing income from fruit and vegetables

Major Research Domain:
Integrated pest management

Budget:
1,193,000 €

Goal:
To improve livelihoods through sustainable production and utilization of cashew.

Purpose:
To develop and implement in collaboration with national and international partners, sustainable integrated management strategies for major cashew insect pests and diseases in SSA; and to train a cadre of scientists to enhance national capacity to implement biocontrol-based IPM in cashew production in Benin and Tanzania.

Outputs:
Output 1: Landscape and habitat management effects on diversity, abundance and population dynamics of key cashew insect pests (with emphasis on Helopeltis spp. and Pseudotheraptus wayi in Tanzania, and on stem borers in Benin) and their beneficials

(pollinators and natural enemy complex) determined.
Output 2: Bio-pesticide delivery systems including semiochemical based mass-trapping/monitoring tools and potent entomopathogens/botanicals developed and tested
Output 3: The role of Oecophylla longinoda Latr. in the management of mirid pests assessed, management strategy evaluated, fine-tuned and disseminated.
Output 4: Alternatives to current management strategies for powdery mildew and leaf and nut blight identified and validated and their impact on beneficials (pollinators and natural enemies complex) determined.
Output 5: Assessment of current pathways of cashew production and marketing information; and ex ante impact assessment of potential cashew IPM strategies.
Output 6: Training programme and information dissemination initiated with national partners.

Phase II
Output 1: IPM-compatible strategies with semiochemicals, entomopathogens, weaver ants and others assembled and validated in large scale field trials.
Output 2: Field application effects of the IPM package on beneficial organisms (pollinators and arthropod natural enemies) quantified.
Output 3: Impact assessment of new IPM strategies conducted.
Output 4: Scaling up of new IPM technologies and dissemination strategies.

Major Results Achieved:
not yet available

Publications:
Not available

Project Title:
Developing high intensity fruit garden agroforestry systems for small-scale farmers of Eastern Africa

Project Coordinator:
(PostDoc) Dr. Katja Kehlenbeck

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Not available

Partner Institute:
University of Goettingen - Agrobioversity in the Tropics, Underutilized Crops, Food Quality, Germany

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Collaborating Institutions:
Challenge Program: 'High Value Crops - Fruits and Vegetables' currently in elaboration by a number of institutions, including ICRAF

Region:
East Africa

Country:
Kenya, Uganda

Thematic Priority:
Not available

Major Research Domain:
Food and nutrition security of rural households, diversification of crop portfolio, fruit garden agroforestry systems, capacity building of national agricultural research institutes

Budget:
143,425 €

Goal:
Micronutrient malnutrition concerns many food-insecure households in sub-Saharan Africa, resulting in anaemia, cretinism, and blindness on millions of people. In India, studies of the already existing intensive small-scale fruit garden agroforestry systems yielded an extended tree management knowledge and improved fruit tree varieties, among others. Making available well-adapted quality germplasm and information about tree management and fruit nutritional values, among other approaches, will most likely contribute not only to improve cash income generation, but also to increase fruit consumption levels of smallholder farmers and rural populations in the target region.

Purpose:
This project will be carried out in the frame of the foreseen Challenge Program: 'High Value Crops - Fruits and Vegetables' currently in elaboration by a number of institutions, including ICRAF. As a part of this Challenge Program, the proposed study will contribute to increase smallholder agricultural production, livelihood opportunities, and incomes in Eastern and Southern Africa through the development of intensive fruit-based agroforestry systems.

Outputs:
The output of this study will contribute to develop intensive fruit garden agroforestry systems for small-scale farmers of Eastern and Southern Africa. Availability of superior varieties of selected fruit tree species will result in improved nutrition, particularly of children, and increased generation of cash income by selling surplus tree products. Food and nutrition security of rural households will be improved by diversification of the available crop portfolio.

Major Results Achieved:
not yet available (new project)

Publications:
Not available

Project Title:
Community management of crop diversity to enhance resilience, yield stability and income generation in changing West African climates (CLIMATE CHANGE)

Project Coordinator:
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Partner Institute:
University of Hohenheim, Stuttgart, Prof. K. Stahr, Dr. L. Herrmann, Dept. Soil Science Land Evaluation, Prof. Dr. V. Hoffmann, Dept. Agric. Communic. Extension, Germany;

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Collaborating Institutions:
Fuma Gaskya, INRAN-Niger, AGRHYMET, Niger;
AMEDD, IER, Mali;
NAP / FREED, SARI-Ghana, Ghana;
INERA, Burkina Faso;

Region:
West Africa

Country:
Burkina Faso, Ghana, Mali, Niger

Thematic Priority:
Not available

Major Research Domain:
Not available

Budget:
1,180,000 €

Goal:
To enhance farm community resilience, production stability and income generation in West Africa under variable and changing climates

Purpose:
To assist NARS and farmers to more effectively utilize agro biodiversity of locally adapted, farmer-preferred crops and supporting NRM practices as a buffer against current climate variability and a preparation towards future climate change

Outputs:
- Patterns and trends in climate variability and change characterized for smallholder agricultural applications in target environments;
- Current agro-biodiversity management at community, landscape and regional scales assessed;
- Multi-location performance of various IGNRM options from biophysical and economic standpoints assessed and best-bet options identified at pilot sites;

- Tools developed for mobilization and upscaling of crop diversity and natural resource options under defined climatic scenarios for selected target traits and environments (TPE);
- Adaptive capacities of stakeholders including local decision makers strengthened through a regional learning network and Community of Practice.

Major Results Achieved:
not yet available (new project)

Publications:
Not available

Project Title:
Mobilizing regional diversity for creating new potentials for pearl millet and sorghum farmers in West and Central Africa

Project Coordinator:
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Partner Institute:
University of Hohenheim (UH), Institute of Plant Breeding, Seed Science, and Population Genetics, Dr. H.K. Parzies, Profs. H.H. Geiger and A.E. Melchinger;

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Collaborating Institutions:
Lake Chad Research Institute (LCRI), Nigeria;
Institute of Agricultural Research (IAR), Nigeria;
Institut National de Recherches Agronomiques du Niger (INRAN), Niger;
Institut National de l'Environnement et Recherche Agricole (INERA), Burkina Faso;
Institut d'Economie Rurale (IER), Mali;
Institut Sénégalais de Recherche Agricole (ISRA), Senegal;

Region:
Central Africa, West Africa

Country:
Burkina Faso, Mali, Niger, Nigeria, Senegal

Thematic Priority:
Sustainable increase in productivity
Conservation and efficient use of natural resources and biodiversity

Major Research Domain:
sorghum, pearl millet, genetic diversity, farmer-participatory approach, molecular markers, seed production

Budget:
1,150,000 €

Goal:
To enhance rural livelihoods and household food security in pearl millet-and sorghum-growing areas of WCA through cultivation of adapted, higher-yielding and stable cultivars of these staple cereals

Purpose:
To assist NARS in the target countries to more effectively utilize genetic diversity of locally adapted, farmer-preferred photoperiod-sensitive, pearl millet and sorghum germplasm in their breeding programs

Outputs:
- Increased access of NARS and farmers to new pearl millet germplasm from WCA (Senegal to Sudan), characterized for adaptation to the predominant agro-ecological zones of WCA.

- Identification of heterotic pools in adapted pearl millet and sorghum germplasm to achieve hybrid vigor and yield stability through increased heterozygosity.
- Initial implementation of a regional strategy for integrating the heterotic pools in NARS' pearl millet and sorghum breeding programs.
- Enhanced cultivation by farmers of superior open-pollinated pearl millet varieties and new guinea-race sorghum hybrids resulting from the effective use of the heterotic pools.
- Availability of allele-specific molecular markers for genes controlling photoperiod sensitivity of flowering time in pearl millet and sorghum.
- Enhanced effectiveness of cereal improvement in WCA through increased NARS capacity for regional integration of farmer-participatory recurrent selection programs and use of new molecular breeding tools.

Major Results Achieved:
Farmer-participatory, multi-location evaluation of superior pearl millet cultivars identified in trials of this project according to three different agro-ecological zones was conducted in Nigeria, Niger, Burkina Faso, Mali, and Senegal. From each of the trials, NARS partners selected promising entries that are currently being multiplied at ICRISAT-Niger to become new experimental cultivars, or candidates for further recurrent improvement. With completion of the third year trials, an excellent data set has been created to analyse the size of genetic, genotype × location, genotype × year and threefold interaction variances in order to derive sound conclusions about the future breeding strategy and yield stability. Useful genotypic data for the diversity analysis had been obtained for 16 Simple Sequence Repeats (SSRs) on 201 pearl millet accessions, and for 33 SSR markers on 158 sorghum accessions. This marker data was used to analyze the similarity between individual pairs of accessions. The analysis of the photoperiodic response and population structure of 200 pearl millet lines was finalized. Nurseries were provided to NARS in six countries for identification of promising hybrids that warrant further evaluation. Regional cooperation was further enhanced through zone-specific multi-location testing. The new diversified populations created in the project through crossing of genetically diverse landraces are increasingly used by partners and further improved through recurrent selection. All NARS partners were trained in heterotic grouping, recurrent selection and regional cooperation. Pearl millet and sorghum breeders from Nigeria, Niger, Burkina Faso and Mali were trained in participatory plant breeding.

Comment:
A no-cost extension until December 2009 is required to finalize Outputs 5 and 6, and will be officially applied for with BMZ/GTZ.

Publications:
- Bhosale, S. 2008. Evaluation of photoperiodic response in sorghum and pearl millet under field conditions. In: Book of Abstracts. Control of Flowering Time and Applications for Plant Breeding . Salzau, Germany, September 22nd - 24th 2008. Poster.
- Clerget B., B.I.G. Haussmann, S.S. Boureima, and E. Weltzien. 2007. Surprising Flowering Response to Photoperiod: Preliminary Characterization of West and Central African Pearl Millet Germplasm . E-Journal of Semi-Arid Tropical (SAT) Research. Vol. 5.1. Sorghum, millets and other cereals. http://ejournal.icrisat.org/. 4pp.
- Haussmann B.I.G., Boubacar A., Boureima S.S., and Vigouroux Y. 2006. Multiplication and preliminary characterization of West and Central African pearl millet landraces. International Sorghum and Millet Newsletter 47: 110-112.
- Haussmann BIG and Angarawai I. 2008. Pearl millet hybrids in West and Central Africa. In: Proceedings of the West African Training Workshop on hybrid sorghum and pearl millet breeding, held at Bamako, Mali, 17-19 April 2007 (HFW Rattunde and B. Clerget, EDS.). Patancheru, Andhra Pradesh, India. International Crops Research Institute for the Semi-Arid Tropics, pp 19-20.
- Haussmann BIG, Boureima SS, Kassari IA, Moumouni KH, and Boubacar A. 2007. Two mechanisms of adaptation to climate variability in West African pearl millet landraces – a preliminary assessment. E-Journal of Semi-Arid Tropical (SAT) Research. Vol. 3(1). Sorghum, millets and other cereals. http://ejournal.icrisat.org/. 3pp.
- Haussmann BIG. 2008. Assessing GCA and SCA – Estimating general and specific

combining ability. In: Proceedings of the West African Training Workshop on hybrid sorghum and pearl millet breeding, held at Bamako, Mali, 17-19 April 2007 (HFW Rattunde and B. Clerget, EDS.). Patancheru, Andhra Pradesh, India. International Crops Research Institute for the Semi-Arid Tropics, pp 46-47.
- Kitavi M.N., 2008. Assessment of the genetic diversity and patterns of relationships of West African sorghum accessions using micro-satellite markers. M.Sc. thesis, Kenyatta University, Nairobi, Kenya.
- Li, Y. 2008. Expression of homologous genes to the dwarf8 gene in pearl millet and sorghum. M.Sc. thesis, University of Hohenheim, Stuttgart, Germany.
- Li, Y. 2008. Two novel homologous genes to maize D8: Sorghum SbD8 and pearl millet PgD8. In: Book of Abstracts. Control of Flowering Time and Applications for Plant Breeding. Salzau, Germany, September 22nd - 24th 2008. Oral Presentation.
- Moumouni HK. 2008. « Analyse de l'hétérosis, des aptitudes générales et spécifiques à la combinaison, et des effets maternels dans un diallèle complet entre sept variétés locales de petit mil (Pennisetum glaucum (L.) R.Br.) . submitted to : Université Abdou MOUMOUNI, Faculté d'Agronomie, Centre Régional d'Enseignement Spécialisé en Agriculture (CRESA), Niger pour obtension du « Diplôme d'Études Supérieures Spécialisées (D.E.S.S.) , Protection de l'Environnement et Amélioration des Systèmes Agraires Sahéliens ». 66 pp.
- Oungubo, M.N. 2008. Genetic diversity in West African pearl millet landraces as revealed by simple sequence repeats (SSRs); M.Sc. thesis, Kenyatta University, Nairobi, Kenya.
- Pasam, R.K. 2008. Evaluation of photoperiodic response and characterization of population structure of pearl millet germplasm from West and Central Africa. M.Sc. thesis, University of Hohenheim, Stuttgart, Germany.
- Rattunde HFW, and Clerget B. Proceedings of the West African Training Workshop on hybrid sorghum and pearl millet breeding, held at Bamako, Mali, 17-19 April 2007. Patancheru, Andhra Pradesh, India. International Crops Research Institute for the Semi-Arid Tropics, pp 75.
- Traoré PCS, Vaksmann M, Kouressy M, Haussmann BIG, Maikano I and Clerget B. 2008. Beyond "Normal" LGP: Mapping Cultivar Adaptation in Variable West African Climates. Poster presentation at the CIMR Symposium: Partnerships and Solutions for Agriculture and Natural Resources, June 10-13, 2008, in St. Pete Beach, Florida, USA.

Project Title:
Sustainable conservation and utilization of genetic resources of two underutilized crops - finger millet and foxtail millet - to enhance productivity, nutrition and income in Africa and Asia

Project Coordinator:
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Partner Institute:
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Partner Institute email:
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Collaborating Institutions:
NARO,Uganda
KARI Kenya
DRD, Tanzania
CR Ravishankar, S Ramesh, India
ANGRAU, India
RAU,India

Region:
AFRICA, ASIA

Country:
India, Kenya, Tanzania, Uganda

Thematic Priority:
Sustainable increase in productivity
Conservation and efficient use of natural resources and biodiversity

Major Research Domain:
- finger millet
- foxtail millet
- underutilized species
- genotyping

Budget:
1,000,000 €

Goal:
The goal is to enhance rural livelihoods and household food and nutritional security in the finger millet and foxtail millet growing areas of Africa and South Asia through cultivation of adapted, higher-yielding and stable cultivars of two underutilized crops - finger millet and foxtail millet.

Purpose:
To achieve this goal, the project will assist NARS in the target countries to more effectively utilize genetic diversity of locally adapted finger millet germplasm in their breeding programs.

Outputs:
- Availability of information on evaluatin of core collections of finger millet and foxtail millet of morphological, agronomic, and nutritional traits (protein, iron, zinc, calcium, beta carotene), and characterization of genetic diversity and genetic distance/similarity among all accessions
- Mini core collections representing the diversity of core collections of finger millet and foxtail millet established using molecular marker data and characterization/evaluation data on morphological, agronomic, abiotic stresses and nutritional traits
-Implementation of complementary conservation activities ex situ (genebank, mini core collection) and in situ (on farm through cultivation of diverse materials) for finger millet and foxtail millet at selected locations in East Africa and South Asia
-Availability of information on genetic diversity and stabiliy in finger millet and foxtail millet mini core collections and trait specific germplasm for agronomic, abiotic stresses and nutritional traits, for resistance to important diseases and insect pests
- Availablitiy of agronomically superior genetically diverse germplasm for protein, iron, zinc, calcium, and beta carotene contents, abiotic stresses and for resistance to important diseases and insect pests to the farmers for use and for scientists for developing broad-based superior cultivars in Africa and Asia
- Enhanced effectiveness of finger millet and foxtail millet improvement in Africa and Asia through increased NARS capacity for use of the genetic resources and marker technology

Major Results Achieved:
not yet available (new project)

Publications:
Not available

Project Title:
Information Services and Analyses to Address the Global Food Security Crisis

Project Coordinator:
Dr. Teunis van Rheenen (IFPRI)

Project Coordinator email:
Not available

Partner Institute:
Not available

Partner Institute email:
Not available

Collaborating Institutions:
High Level Task Force on the Food Crisis Secretariat (UNDP) - GB

Region:
AFRICA, ASIA, LATIN AMERICA

Country:
Bangladesh, Brazil, Dem.Rep.Congo, Ethiopia, Guatemala, Haiti, India, Indonesia, Kenya, Malawi, Mexico, Mozambique, Niger, Nigeria, Pakistan, Peru, PR China, Sierra Leone, Sudan, Viet Nam

Thematic Priority:
Not available

Major Research Domain:
To provide timely information and cutting-edge analysis on policy actions for policymakers including the UN Secretary-General and his High Level Task Force on the Global Food Security Crisis for decisionmaking and food security.

Budget:
1,200,017 €

Goal:
To provide timely information and cutting-edge analysis on policy actions for food and nutrition security. Information will include a range of topics including (1) smallholder agriculture; (2) hunger and the role of NGOs; (3) risks and vulnerability assessments for the poor, and (4) national and international policy responses and an evaluation of these responses.

Purpose:
To contribute relevant and timely information for policymakers including the UN Secretary-General and his High Level Task Force on the Global Food Security Crisis for decision-making and food security. This project will contribute to the decision-making processes and will facilitate the global response to the food crisis.

Outputs:
The HLTF will receive reports from the four different components of the project on a bimonthly basis.
Component 1 – Smallholder agriculture
Component 2 – Hunger and the role of NGOs

Component 3 - Risks and vulnerabilities
Component 4 – National and international policy responses

Major Results Achieved:
not yet available - new project

Publications:
Not available

Project Title:
Making Rural Services Work for the Poor - The Role of Rural Institutions and Their Governance for Agriculture-Led Development

Project Coordinator:
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Project Coordinator email:
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Partner Institute:
Prof. Konrad Hagedorn, Chair of Resource Economics, Humboldt-University Berlin;
Dr. Markus Hanisch, Managing Director of the Institue of Cooperative Studies, Humboldt-University Berlin

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Collaborating Institutions:
Uganda:
Makerere University;
National Agriculture Advisory Services (NAADS);

India:
Institute of Social and Economic Change (ISEC);
Institute of Cooperative Management (ICM)

Kyrgyzstan:
Center of Social Research of National Academy of Sciences

Guatemala:
Facultad Latinoamericana de Ciencias Sociales (FLASCO)

Region:
Central Africa, Central America, Central Asia and the Caucasus, South Asia

Country:
Guatemala, India, Kyrgyzstan, Uganda

Thematic Priority:
Rural institutions and their governance

Major Research Domain:
Not available

Budget:
1,000,000 €

Goal:
Direct benefits for target groups - Provision of services to the rural poor is improved due to
- Increased ability of the rural poor to demand sevices and hold service providers accountable
- Increased ability of the rural poor to engage in collective action and to co-produce services
- Improved ability of service providers to supply quality services to which the poor have access

Purpose:
Intended utilization of outputs by recipients / direct clients

Outputs:
- Synthesis paper and policy brief on state of knowledge on rural service provision
- Country-specific reports, Discussion Papers and policy brief on state of knowledge on rural service provision
- Issue-specific reports, Discussion Papers and policy briefs on rural service provision
- Training material on rural service provision
- Proceedings of country workshops
- Proceedings of international workshops
- Set of Governance Indicators

Major Results Achieved:
The research team of the project developed a classification of rural service sectors and a conceptual framework to guide a literature review on rural service provision. The conceptual framework distinguishes demand-side and supply-side approaches to reform rural service provision. Reviews of agricultural extension in India and India's current agricultural extension policy as well as the country-specific review of Guatemala have been completed. Other review activities are ongoing. Different analytical approaches and frameworks to develop a conceptual foundation for the project's research components have been reviewed. A preliminary economic analysis based on existing data was carried out in the four project countries: Uganda, Guatemala, Kyrgyzstan and India. Led by the country counterparts, stakeholder workshops were organized in Kampala, Uganda, Bishkek/Kyrgyz Republic, and in Guatemala. The project was successful in engaging in the policy dialogue of the four project countries. An international Project Inception Workshop was held in Berlin. It proved very useful to build team spirit for the project across the different countries, institutions and disciplines of the team members involved.

Publications:
- Birner, R. and J. Anderson (2007): How to Make Agricultural Extension Demand-Driven? The Case of India's Agricultural Extension Policy, IFPRI Discussion Paper 00729, Development Strategy and Governance Division, International Food Policy Research Institute, Washington, DC.
- Birner, R. and J. von Braun: Decentralization and Public Service Provision – A Framework for Pro-Poor Institutional Design; Manuscript submitted in 2008 for an upcoming book on decentralization, edited by E. Ahmad and G. Brosio.
- Hurtado, Margarita: Guatemala: Revisión de literatura sobre servicios rurales [Guatemala: Review of the Literature on Rural Service Provision]; Manuscript submitted in 2008 to IFPRI (under review).
- Raabe, Katharina: Reforming the Agricultural Extension System in India- What Do We Know About What Works Where and Why? Manuscript submitted in 2007 as IFPRI

Project Title:
Contracting Out of Poverty: Experimental Approaches to Innovation in Agricultural Markets with Small Farmers

Project Coordinator:
Maximo Torero, IFPRI, 2033 K Street, NW, Washington, DC, 20006-1002 USA

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Partner Institute:
Prof. Dr. Manfred Zeller, University of Hohenheim (UH), 70593 Stuttgart

Partner Institute email:
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Collaborating Institutions:
Group of Analysis for Development, Peru
INCAGRO, Peru
Dr. Nguyen Tuan Son, Professor Hanoi Agricultural University, Vietnam
University of Agricultural, Tanzania

Region:
AFRICA, ASIA, LATIN AMERICA

Country:
Peru, Tanzania, Viet Nam

Thematic Priority:
Development of sustainable production systems
Increasing income from fruit and vegetables
Income increases from livestock

Major Research Domain:
- poverty alleviation
- agricultural markets
- innovation
- contract farming
- high value crops

Budget:
950,000 €

Goal:
Welfare of the rural poor is improved due to:
- Increased access of smallholders to contract farming arrangements linking them to dynamic markets for highvalue products.
- Identification of optimal institutional arrangements that provide adequate incentives to firms and farmers by reducing transaction costs in the contractual relationship.

Purpose:
- Policy makers and development practitioners have better information to improve the welfare of the poor by implementing new institutional mechanisms that favor the inclusion of smallholders in markets for high-value

products.
- Contractors in public, private, and third sector organizations demanding contract farming services apply optimal institutional arrangements to improve their access to smallholders by reducing their transaction costs.
- Government agencies, NGOs, and donor organizations that oversee the interests of smallholders provide better information on firms' reputations and reliable third party quality control services for contract enforcement.
- Local researchers learn the necessary skills to implement the recommendations from the study and develop a local network.

Outputs:
- Synthesis paper and policy brief on state of knowledge on contract farm arrangements
- Discussion paper on experimental design and laboratory results
- Discussion paper on field implementation of experiments and preliminary results
- Report and discussion paper on contract farm arrangements (final results)
- Training material on contract farm arrangements
- Proceedings of country workshops
- Proceedings of international workshop
- Training material on rural service provision
- Proceedings of country workshops
- Proceedings of international workshop
- Set of Governance Indicators

Major Results Achieved:
not yet available (new project)

Publications:
Not available

Project Title:
Research and capacity building project to support the implementation of the Comprehensive Africa Agriculture Development Programme (CAADP) Phase II NEPAD

Project Coordinator:
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Partner Institute:
None

Partner Institute email:
Not available

Collaborating Institutions:
University of KwaZulu natal, Africa Center for Food Security (ACFS), Pietermaritzburg, South Africa;
Conference of Ministers of Agriculture of West and Central Africa (CMAWCA), Dakar, Senegal;

Region:
Southern Africa, West Africa

Country:
Senegal, South Africa

Thematic Priority:
Rural institutions and their governance

Major Research Domain:
Agriculture development, NEPAD, poverty reduction, food security, CAADP

Budget:
250,000 €

Goal:
Providing technical assistance that enables the NEPAD Secretariat to successfully carry out its coordination and facilitation role in support of the implementation of CAADP and the realization of its growth, poverty reduction, and food security objectives

Purpose:
Not available

Outputs:
- Successful facilitation of the drafting of a satisfactory Framewort Document of CAADP Pillar 2
- A strategy guide is available under Pillar 3 to facilitate badget negotiations and collaboration between ministry of agriculture and social services ministries to maximize the impact of budget expenditures on agriculture growth and poverty reduction
- A methodology, incl. a computer based program, to anticipate local price adjustment and improve responses during emergeny food crises is developed for use under Pillar 3 of the CAADP agenda

- Establishment and successful operation of a CAADP Journalists Network is faciliated to support adequate reporting on CAADP and its implementation activities on the ground

Major Results Achieved:
The project contributed to the successful completion of the Framework for the Improvement of Rural Infrastructure, and Trade-Related Capacities for Market Access (FIMA) - Framework Document for Pillar 2 of the Comprehensive Africa Agriculture Development Programme (CAADP). The Framework Document provides guidance to regional economic communities and their member countries on the design and implementation of agricultural and rural development strategies. In particular, strategic issues, best practices and successful models of public-private partnership and business to business alliances were analyzed that are needed to effectively integrate smallholder farmers into modern value chains. A guide for benchmarking and monitoring of program implementation and performance under Pillar 2 was developed. Technical advice was provided to the Expert Reference Group that led the drafting of the Pillar Framework Document with particular focus on quality assurance. A Journalist Network was launched which sets the ground work for targeted collaboration to strengthen the position of agricultural journalist in the editorial rooms and improve the coverage of agriculture in national media.

Publications:
- CAADP Pillar 2 Brochure # 1. Strategic Area A: “Raising Competitiveness and Seizing Opportunities in Domestic, Regional, and International Markets.” Prepared by the Conference of Ministers of Agriculture of West and Central Africa with technical assistance from the International Food Policy Research Institute (IFPRI)
- CAADP Pillar 2 Brochure # 2. Strategic Area B: “Investment in Commercial and Trade Infrastructure to Lower the Cost of Supplying Domestic, Regional and International Markets.” Prepared by the Conference of Ministers of Agriculture of West and Central Africa with technical assistance from the International Food Policy Research Institute (IFPRI)
- CAADP Pillar 2 Brochure # 3. Strategic Area C: “Value Chain Development and Access to Financial Services.” Prepared by the Conference of Ministers of Agriculture of West and Central Africa with technical assistance from the International Food Policy Research Institute (IFPRI)
- CAADP Pillar 2 Brochure # 4. Strategic Area D: “Strengthening the Commercial and Technical Capacities of Farmer Organizations and Trade Associations.” Prepared by the Conference of Ministers of Agriculture of West and Central Africa with technical assistance from the International Food Policy Research Institute (IFPRI)
- Framework for the Improvement of Infrastructure and Trade Related Capacities for Market Access (FIMA). Framework for CAADP Pillar II.

Project Title:
Strategies for Adapting to Climate Change in Rural Sub-Saharan Africa: Targeting the Most Vulnerable (CLIMATE CHANGE) (CLIMATE CHANGE)

Project Coordinator:
Gerald C. Nelson, Dr. Stanley Wood, Dr. Siwa Msangi, Dr. Mark Rosegrant, Dr. Jawoo Koo, and Dr. Tingju Zhu, Environment and Production Technology Division, IFPRI;

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Partner Institute:
Potsdam Institute for Climate Impact Research (PIK) – Dr. Hermann Lotze-Campen, Dr. Dieter Gerten;
Leibniz-Centre for Agricultural Landscape Research (ZALF) – Dr. Stefan Sieber, Dr. Rosemarie Siebert;

Partner Institute email:
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Collaborating Institutions:
Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA);
Food, Agriculture, and Natural Resources Policy Analysis Network (FANRPAN);

Region:
East Africa, Europe, Southern Africa

Country:
Germany, South Africa, Uganda

Thematic Priority:
Not available

Major Research Domain:
Climate change, vulnerability, production systems, household level impact, policy decisions;

Budget:
1,180,000 €

Goal:
Reduced vulnerability of rural households to climate change through better-coordinated and targeted food system adaptation strategies

Purpose:
To provide regional organizations, policymakers and farmers in Sub-Saharan Africa with tools to identify and implement appropriate adaptation strategies

Outputs:
- Set of alternative global change scenarios, based on projected changes in climate, land use, socio-economic factors, and alternative policies.
- Typology of production systems that integrates biophysical and socio-economic factors, including intensity of production, land use, cropping/livestock systems, and a range of food security indicators.
- Household-level impact and response matrix by production system under alternative global

change scenarios.
- Micro-level adaptation analysis to support regional/meso-level analysis (selected ASARECA and FANRPAN member countries)
- Robust framework to support policy decisions, which indicates regions and groups to be targeted as well as the appropriate adaptation strategies for target groups/regions based on the matrix of household-level impacts and responses, and associated investment requirements.
- Synthesis reports and manuals for policymakers, outreach, and capacity development

Major Results Achieved:
An initial planning workshop was held via telecom and a project inception workshop was conducted in South Africa to share the proposed project plan with regional stakeholders, identify synergies and develop a detailed plan for implementing the project. Outcomes of the inception workshop include the identification of on-going research projects addressing issues related to adaptation of food systems and rural people to climate change, a list of individuals and institutions working on climate change adaptation in the region, and suggestions that can be used to design the specific project activities. It was agreed that a project steering committee of representatives of selected Sub-Saharan institutions would be chosen. A third meeting was held in Potsdam to plan work on development of climate change scenarios and modeling approaches. This meeting was held jointly with modelers from the BMZ-funded project involving ILRI, PIK, and ZALF who proposed a joint workflow for the two projects.

Publications:
none so far

Project Title:
Working together for market access: strengthening rural producer organizations in Sub-Saharan Africa

Project Coordinator:
Dr. Maximo Torero (IFPRI)

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Partner Institute:
Not available

Partner Institute email:
Not available

Collaborating Institutions:
Prof. Dr. Thomas Berger (University of Hohenheim) and Prof. Dr. Markus Froelich (IZA)

Region:
Sub-Saharan Africa (SSA)

Country:
Senegal, Uganda, Zambia

Thematic Priority:
Rural institutions and their governance

Major Research Domain:
agricultural development strategies, trade and poverty: strengthening the ability of RPOs to improve their members' access to input and output markets

Budget:
1,176,000 €

Goal:
The goal of the project is to improve the lives of smallholder farmers by strengthening the ability of RPOs in Senegal, Uganda and Zambia to improve their members' access to input and output markets. It will do this by identifying specific interventions that can improve the capacity of RPO members to better access and benefit from input and output markets.

Purpose:
- To improve the knowledge of RPOs, and those working with RPOs (such as NARS, government agencies etc.) on the relationship between leadership, activity selection, and the ability of RPOs to improve their members access to input and output markets
- To identify and evaluate interventions in leadership and activity selection—for use by federations of RPOs, NARS, government agencies, donor organizations and NGOs—that will strengthen the ability of RPOs to improve their members' access to input and output markets
- To provide initial analysis and information to the relevant agencies in other countries with similar situations

Outputs:
Step 1: Building a knowledge base
Step 2: Identifying and testing relevant interventions

Major Results Achieved:
not yet available (new project)

Publications:
Not available

Project Title:
Reconstructing agricultural livelihoods in post-conflict situations: The case of Northern Uganda

Project Coordinator:
Dr. Regina Birner, Senior Research Fellow, Development Strategy and Governance Division
International Food Policy Research Institute

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Partner Institute:
DIW Berlin (German Institute for Economic Research)
Lead Researcher: Prof. Dr. Tilman Brück – Head, Dept. of International Economics
Mohrenstraße 58, 10117 Berlin, Germany, Tel.: +49 30 89 789-591; Email: tbrueck@diw.de

Partner Institute email:
tbrueck@diw.de

Collaborating Institutions:
None

Region:
Africa

Country:
Uganda

Major Research Domain:
Post-conflict reconstruction, agricultural policy, rural development, program evaluation, demobilization, gender, vulnerable groups, coping, assistance, livelihoods

Budget:
60,000 €

Goal:
Not available

Purpose:
Not available

Outputs:
Not available

Major Results Achieved:
Not available

Publications:
Not available

Project Title:
Strategies for pro-poor growth and investment in lagging rural regions

Project Coordinator:
(PostDoc) Dr. Clemens Breisinger, IFPRI, 2033 K Street, NW, Washington DC 20006-1002, U.S.A.

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Partner Institute:
University of Hohenheim, Dept. of Rural Development Theory and Policy, Stuttgart, Prof. Dr. Manfred Zeller;
University of Goettingen, 37073 Goettingen, Prof. Stephan Klasen

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Collaborating Institutions:
Ghana Strategy Support Program, Shashi Kolavalli
Ghana Statistical Services, Magnus Duncan
Ministry of Finance and Development (MOFED),Ghana, Dr. Godwin Amuzu
Ministry of Agriculture and Food (MOFA), Ghana, Dr. Aggrey Fynn
University of Ghana, Prof. Ramatu Al Hassan

Region:
South Asia, West Africa

Country:
Ghana, Viet Nam

Thematic Priority:
Rural institutions and their governance

Major Research Domain:
globalisation and rural development, pro-poor growth, lagging regions, rural-urban linkages, agricultural development strategies, trade and poverty, public investments

Budget:
204,884 €

Goal:
To coordinate research activities, collect and analyze secondary data and jointly build the regionalized CGE (computable general equilibrium) models for Ghana and Viet Nam

Purpose:
To be responsible for the training of Ghanaian and Vietnamese collaborators on economy-wide modelling and coordinate outreach and dissemination of results to national audiences and international research community

Outputs:
- Realization of capacity building workshops in Ghana and Viet Nam
- Design of related training materials and manuals that will be published as a public good
- Two macro-meso-micro-spatial CGE models and their documentation for Ghana and Viet

Nam
- Report on a typology and development and investment strategies of lagging regions

Major Results Achieved:
A diagnostic analysis of household behaviour and farmers incentives was carried out in Northern Ghana and led to a better understanding of constraints and opportunities faced by farmers in Northern Ghana. It resulted in a broader understanding of the functioning of input markets, marketing channels for farmers, and the role of traders in the supply chain was broadened. In a case study on maize, the project team assessed the production technologies and costs for Northern Ghanaian farmers, analyzed producer-trader relationships, and transportation costs from the farm to the market. The group also focussed on labour markets, including off-farm opportunities for farmers, the role of migrant labourers in agricultural production, and the role of remittance for household incomes. Causes for price differences, including the role of road and market infrastructure, retail-wholesale linkages, and interregional and international trade were assessed. To analyze possible pathways and implications towards Ghana's official development goal of reaching middle-income status an IFPRI discussion paper examining other countries' experiences was produced. The results of the model simulation suggest that unlike in other countries, agriculture in Ghana is likely to remain the mainstay of growth and export earnings. Two workshops on economic modelling were conducted to build analytical capacity and foster economy-wide strategic thinking among researchers and policy analysts in Ghana. A 2005 social accounting matrix for Ghana has been build as the basis for modelling the lagging Northern region.

Publications:
- Benin S., Nin Pratt A., Fan S., Breisinger C., Mogues T., Thurlow J., Diao X. 2007. Measuring The Growth and Poverty Reduction Impacts of Public Investments in Agriculture and Rural Areas. An economy-wide approach linking micro, sector, and macro level analyses. Draft paper. Development Strategy and Governance Division. International Food Policy Research Institute.
- Breisinger C., Diao X. and Thurlow J. 2007. Accelerating Growth and Structural Transformation: Assessing Ghana's Options for Reaching Middle-Income Country Status. Under review in Journal of Economic Modeling
- Breisinger C., Diao X. and Thurlow J. Yu B., Kolavalli S. 2008. Accelerated Growth and Structural Transformation: Assessing Ghana's Options for Reaching Middle-Income Country Status. IFPRI Discussion Paper 750. Washington DC. http://www.ifpri.org/pubs/dp/ifpridp00750.asp Paper also as background paper World Bank Country Economic Memorandum. 2007.
- Breisinger C., Diao X., Kolavalli S., and Thurlow J. 2008. Aiming for Middle-Income Country Status: What Are the Growth Options? Ghana Strategy Support Program-IFPRI. Discussion Brief 1. Accra. Ghana. http://www.ifpri.org/themes/gssp/pubs/gsspbrief01.pdf
- Breisinger C., Diao X., Kolavalli S., and Thurlow J. 2008. The Role of Cocoa in Ghana's Future Development. Ghana Strategy Support Program Background Paper 11. Accra. Ghana. http://www.ifpri.org/themes/gssp/pubs/gsspwp11.pdf
- Breisinger C., Thurlow J., Duncan M. 2007. A 2005 Social Accounting Matrix (SAM) For Ghana. Ghana Statistical Services (GSS) and International Food Policy Research Institute (IFPRI) under the Ghana Strategy Support Program (GSSP). Accra. Ghana. http://www.ifpri.org/data/Ghana03.asp
- Chamberlin J., Diao X., Kolavalli S., and Breisinger C. 2007. Smallholder Agriculture in Ghana. Ghana Strategy Support Program-IFPRI. Discussion Brief 3. http://www.ifpri.org/themes/gssp/pubs/gsspbrief03.pdf
- Kolavalli S., Chamberlin J., Breisinger C. 2007. Northern Ghana. Insights from a Diagnostic Analysis on the Functioning of Maize Value Chains. Draft paper.

Project Title:
Banana tissue culture: community dissemination pathways for delivery of high quality planting material to create markets for African farmers

Project Coordinator:
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Partner Institute:
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Collaborating Institutions:
Bioversity International, Germany
Georg-August-University Göttingen, Germany
Institute de Recherche Agronomique et Zootechnique, Burundi
Jomo Kenyatta University of Agriculture and Technology, Kenya
National Agricultural Research Organization, Uganda
University of Hohenheim, Germany
Volunteer Efforts for Development Concerns
Zanzibar Commission for Agriculture, Tanzania

Region:
East Africa, Southern Africa

Country:
Burundi, Kenya, Tanzania, Uganda

Thematic Priority:
Promoting conservation and characterization of underutilized plant genetic resources to increase the income of the poor
Tolerance to selected abiotic stresses
Rural institutions and their governance

Major Research Domain:
- banana
- tissue culture
- planting material
- market pathways

Budget:
999,900 €

Goal:
To ensure sustainable small-scale banana production in Eastern and Southern Africa, and to optimize the use and preservation of banana biodiversity

Purpose:
To generate efficient market pathways to supply, cultivate and market high quality planting material to small-scale farmers through the promotion of novel and sustainable partnerships

between farmers and private enterprises, which are supported by improved institutional policies

Outputs:
- Uniform and high quality planting material produced by TC producers
- TC planting material supplied to small-scale farmers through farmer-managed community nurseries
- A post-flask management package for TC planting material tailored and transferred to smallscale farmers
- New sources of resistance against abiotic stresses made available to small-scale farmers
- Establishment of farmer cooperatives linked to farmermanaged community nurseries
- New, larger and dedicated markets created for small-scale farmer cooperatives

Major Results Achieved:
A detailed questionnaire with a combined quantitative and qualitative approach was developed to map the situation of tissue culture (TC) nurseries in Burundi, Kenya and Uganda. Assessments of all active and inactive nurseries in the three target countries Burundi (4), Kenya (19) and Uganda (18) were completed. An initial meeting of TC stakeholders from the target countries was undertaken in Kenya in April 2008. During this meeting, strategies and work plans were discussed for the various activities, adjusting accordingly were necessary. Seven intervention sites in Burundi and Uganda have been selected and are based on locations of existing TC nurseries. Demonstration gardens are being erected with those TC nurseries that either did not have a demonstration garden or that have a dysfunctional demonstration garden. A survey was designed to determine farmer awareness in Pemba and Zanzibar of cultivar responses to drought/poor soil. Development of micro-credit schedules and business plans is underway in Burundi. Based on a literature review and an exploratory visit to Kenya, methodologies and models for quantitatively analyzing TC banana adoption and impacts have been developed.

Comments:
Some amendments were made with regard to the initial planning. A situation analysis (comprehensive study of all TC nurseries in the region) was included. Establishment of nurseries will not be carried out initially. Rather, intervention sites were determined based on existing nurseries identified from the situation analysis.

Publications:
Apart from 5 thesis proposals and meeting minutes no publications have been produced so far.

Project Title:
Physiological Mechanisms and their Variability for Drought Tolerance in Cassava

Project Coordinator:
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Partner Institute:
PD Dr. Brigitte L. Maass, Agrobiodiversity & Plant Genetic Resources in the Tropics; Georg-August-University Goettingen; Grisebachstr. 6; D-37077 Goettingen, GERMANY

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Collaborating Institutions:
University of Cornell, USA
EMBRAPA, Brazil
KARI, Kenya
ARI, Tanzania
SARI, Ghana
CIAT, Colombia

Region:
AFRICA, South America

Country:
Brazil, Colombia, Ghana, Kenya, Tanzania

Thematic Priority:
Not available

Major Research Domain:
Germplasm evaluation, plant breeding, drought tolerance

Budget:
59,147 €

Goal:
Contribute to a reduction in poverty in drought prone rural environments through increased food security and income generation.

Purpose:
Enhancing yield and yield stability of cassava in these environments

Outputs:
- Geographical area and rural population represented by drought evaluation field sites in Tanzania, Kenya and Ghana defined using GIS tools
- Potential impact of improved drought tolerance in cassava estimated
- Drought tolerant and drought susceptible African cassava germplasm identified
- African germplasm evaluated for drought tolerance in relation to a selection of drought tolerant germplasm from South America

- EMBRAPA/CIAT mapping population phenotyped in Kenya
- Physiological attributes that contribute to drought tolerance in cassava identified

Major Results Achieved:
Basic agro climatic parameters important for crop cultivation were extracted from available public domain climate and soil parameters. Monthly rainfall grids covering the period 1901 to 2005 were obtained and processed in order to establish history and patterns of drought for all project areas. Recent population data for the project countries Ghana, Kenya, Tanzania were collected, as well as population grids for the whole continent to extrapolate and calculate populations in areas represented by the trial sites. A straightforward, economical and reproducible protocol for hardening and rapid micro propagation of cassava plantlets under local, low cost conditions has been developed. The protocol was successfully used to acclimatize and rapid micro-propagate 53 putative drought tolerant and drought susceptible African cassava germplasm from IITA. Evaluation of contrasting IITA genotypes in Kenya showed significant differences in yield between the genotypes and within the treatments.

Publications:
- Mutegi, R., Ferguson, M., Maass, B.L., Tiessen, H., Mkamilo, G., Kamau, J., Adjebeng-Danquaah, J., Alves, A., Setter, T., and Fregene, M. 2008. Field evaluation of cassava varieties under drought stress in Kenya, Tanzania and Ghana. Poster presented at the Global Cassava Partnership Meeting in Gent, Belgium.

Project Title:
Preventing and containing trypanocide resistance in the cotton zone of West Africa (Phase II)

Project Coordinator:
Dr. Oumar Diall, ILRI, P.O.Box 30709, Nairobi, Kenya (field coordinator)
Dr. Thomas Randolph (project coordinator)

Project Coordinator email:
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Partner Institute:
Freie Universität Berlin, Dr. Clausen; Prof. Karl Zessin;
Universität Hannover, Prof. Waibel;

Partner Institute email:
Not available

Collaborating Institutions:
Laboratoire Vétérinaire Central, Bamako, Mali;
Centre International de Recherche-Développement sur l'Élevage en Zone subhumide (CIRDES), Bobo Dioulasso, Burkina Faso;
International Trypanotolerance Center (ITC), Banjul, The Gambia;
Unité de Lutte contre la Trypanosomose (ULCT), Bamako, Mali;
Unité Nationale de Lutte contre la Trypanosomose (UNLT), Bobo-Dioulasso, Burkina Faso;
Laboratoire Regional d'Élevage de Tenkodogo, Burkina Faso;
Institut d'Économie Rurale (CRRA-IER), Sikasso, Mali;
Direction National de l'Élevage (DNE/IRAG), Conakry, Guinea;
Tsetse and Trypanosomosis Control Unit (TTCU), Pong Tamalé, Ghana;
Farmer groups, NGOs, and private sector collaborators;

Region:
West Africa

Country:
Kenya

Thematic Priority:
Not available

Major Research Domain:
trypanocide resistance, agro-pastoral production systems, trypanosomis

Budget:
1,050,000 €

Goal:
To protect and improve the sustainable livelihoods of resource-poor livestock keepers in agro-pastoral production systems

Purpose:
To enhance the current and future efficacy of trypanocides as an effective component of improved integrated trypanosomosis control strategies

Outputs:
- Identify and evaluate suspected hot spots of trypanocide resistance in new areas across the cotton zone, and initiate the risk communication process
- Regional roll-out of trypanocide resistance prevention strategies
- Identify and test best-bet strategies to contain and reverse trypanocide resistance
- Assess the impact of BMZ investments in trypanocide resistance research
- Strengthen national and regional capacity to support resistance monitoring and the implementation and evaluation of appropriate trypanosomosis control strategies

Major Results Achieved:
Results of the previous project phase were disseminated in scientific journals: one describing a simple, cheap, user-friendly tool for improving the correct diagnosis of trypanosomosis and another reporting the results of the trials evaluating Rational Drug Use strategies. Evaluation of suspected trypanocide resistance “hot spots” in Ghana and Benin improved understanding of the regional distribution of trypanocide resistance. The prevalence of the disease in the suspected “hot spots” in both countries was low. The low risk situation found in both countries may be related to the difference in the river network, which is less dense in northern Ghana and Benin as compared to the countries studied before (Mali and Burkina Faso), and which affects the prevalence of riverine tsetse species. Further, the absence of a savannah tsetse species, due to similar degradation of their habitat as observed in the southern parts of Mali and Burkina Faso may have contributed to the low-risk situation. Preliminary results on the potential added value of deworming were promising in further reducing trypanosome populations, including resistant trypanosomes, by improving the ability of infected cattle to clear existing infections in combination with trypanocide treatments. In four countries (Burkina Faso, Ghana, Guinea and Mali), workshops were conducted to identify appropriate partners across the region and to raise awareness of the problem of trypanocidal drug resistance among a broader range of stakeholders and thereby cultivate support for the strategies needed to address it.

Comment:
During the annual planning meeting of the project partners the decision was taken to request from BMZ/GTZ a no-cost extension in order to complete delayed activities including students’ studies.

Publications:
-- Affognon H, Grace D, Diall O, Randolph T, Clausen P-H, Waibel H. Modelling the productivity of trypanocides in villages under the risk of drug resistance in West Africa: evidence of incentives to farmers to continuing using more and more drugs. 29th ISCTRC Meeting, 1-5 October 2007, Luanda, Angola.
- Affognon H, Randolph T, Waibel H, Grace D. Policy constraints to strategies for improving the management of trypanocide resistance in controlling African Animal Trypanosomosis in Mali. 29th ISCTRC Meeting, 1-5 October 2007, Luanda, Angola.
- Affognon H., M. Coulibaly, O. Diall, D. Grace, T. Randolph et H. Waibel (2008) : Etude des politiques relatives aux stratégies de gestion de la chimiorésistance dans le cadre de la lutte contre la trypanosomose en Afrique de l’Ouest: Cas du Mali. ILRI Research Report No. 17. ILRI (International Livestock Research Institute), Nairobi, Kenya, 69 pp.
- Barry AM, Vial L, Diallo A, Diall O, Muenstermann S, Randolph T, Clausen P-H. Situation de la trypanosomose et de la résistance aux trypanocides dans les élevages bovins Ndama de la zone cotonnière de Haute Guinée. 29th ISCTRC Meeting, 1-5 October 2007, Luanda, Angola.
- Diall O, Randolph T, Clausen P-H, Waibel H, Sidibé I, Schoenefeld A, Diallo MB, Bocoum Z, Sangaré M. Detection and control of trypanocide resistance: achievements the ILRI/BMZ project in the cotton zone of West Africa. 29th ISCTRC Meeting, 1-5 October 2007, Luanda, Angola.
- Diall O. African Animal Trypanosomosis: Review of control strategies and research activities. Keynote address. 29th ISCTRC Meeting, 1-5 October 2007, Luanda, Angola.
- Djouara H, Randolph T, Diall O. Stratégies paysannes et accès à l’information sur les trypanocides : cas des agro-éleveurs de la zone cotonnière du Mali. 29th ISCTRC Meeting,

1-5 October 2007, Luanda, Angola.
- Grace D, Affogon H, Diall O, Randolph T, Clausen P-H. Knowledge, attitude and practices regarding control of trypanosomosis in three countries in West Africa. 29th ISCTRC Meeting, 1-5 October 2007, Luanda, Angola.
- Grace D, Himstedt H, Sidibe I, Randolph T, Clausen P-H. 2007. Comparing FAMACHA© eye color chart and hemoglobin color scale tests for detecting anemia and improving treatment of bovine trypanosomosis in West Africa. Veterinary Parasitology 147(1-2):26-39.
- Grace D, Randolph T, Diall O, Clausen P-H (2008): Training farmers in rational drug-use improves their management of cattle trypanosomosis: A cluster-randomised trial in south Mali. Preventive Veterinary Medicine 83:83-97.
- Grace D, Randolph T, Diall O, Clausen P-H. 2008. Better management of cattle trypanosomosis through training farmers in Rational Drug Use: a cluster randomised controlled trial in south Mali. Preventive Veterinary Medicine 83 (Jan 2008):83-97.
- Grace, D, Randolph T, Diall O, Clausen, P-H. Better management of cattle trypanosomosis through training farmers in Rational Drug Use: a controlled trial in Mali. 29th ISCTRC Meeting, 1-5 October 2007, Luanda, Angola.
- Liebenehm S (2008): Economic impact of livestock research on farmers' knowledge and productivity: The case of trypanosomosis in West Africa. MSc thesis, Leibniz University of Hannover, Hannover, Germany, 115 pp.
- Talaki E, Sidibé I, Diall O, Belem G, Pangui LJ, Affognon H, Grace D, Djiteye A, Bocoum Z, Diarra B. Variations saisonnières et facteurs de risque des trypanosomoses animales dans un contexte de chimiorésistance dans la zone de Sikasso au Mali. 29th ISCTRC Meeting, 1-5 October 2007, Luanda, Angola.

Project Title:
Safe food, fair food: Building capacity to improve the safety of animal-source foods and ensure continued market access for poor farmers in sub Saharan Africa

Project Coordinator:
Dr. Delia Grace, 30709, Nairobi, 00100 Kenya

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Partner Institute:
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Collaborating Institutions:
Urban Harvest Regional Office (Kenya)
Institut du Sahel (Mali)
University of Pretoria (South Africa)
Agriculture Research Institute of Mozambique (Mozambique)
University of Eduardo Mondlane
Addis Ababa University (Ethiopia)
Sokoine Univ. of Agriculture (Tanzania)
University of Ghana, (Ghana)
University of Nairobi (Kenya)

Region:
Sub-Saharan Africa (SSA)

Country:
Ethiopia, Ghana, Kenya, Mali, Mozambique, Tanzania

Thematic Priority:
Income increases from livestock

Major Research Domain:
- animal source food
- livestock production
- food safety
- informal markets
- participatory risk analysis

Budget:
1,049,928 €

Goal:
The goal of the project is to contribute to poverty alleviation by protecting both the health of low-income consumers and livestock-based livelihoods of the poor through improved food safety of livestock products in domestic markets in east, west and southern Africa.

Purpose:
The purpose of the project is to establish capacity for the sustained promotion of risk-based approaches thus improving food safety and participation of the poor in informal markets for livestock products in sub Saharan Africa.

Outputs:
- Increased understanding of participatory risk assessment and willingness to use it among those responsible for food safety.
- A core expertise in each region supported by a cross-regional network on risk analysis enabling its continued promotion and development.
- Validated participatory risk analysis methodologies and decision-support tools being used to manage food safety.
- Improved knowledge of, and capacity to manage, risks associated with livestock products in the informal sector.

Major Results Achieved:
During the first year of this project the administrative arrangements and institutional agreements were established, an inception workshop was convened, and implementation was initiated through two training courses. To facilitate implementation of project activities, collaborative research agreements were established. The two regional training courses dealt with Participatory Risk Analysis for selected key food safety stakeholders from the study countries. The trainees included both individuals targeted as future 'champions' of risk assessment as well as decision makers whose support is crucial to promote uptake. The first course was held in South Africa and 23 participants were invited from Tanzania, Ghana, Mozambique and South Africa. The second course was held in Ethiopia for 19 participants from Kenya, Tanzania, Ethiopia, Mali and Côte d'Ivoire. Field work has started in 4 countries. Proof-of-concept studies using participatory risk analysis were designed for seven countries. The content of the project website was discussed and agreements on hosting as part of the ILRI website were made.

Publications:
- Grace D., Randolph T., Olawoye J., Dipelou M., Kang'ethe E. (2008). Participatory risk assessment: a new approach for safer food in vulnerable African communities. Development in Practice, Volume 18, Issue 4:611 – 618
- Grace, D., Omore, A., Randolph, T., Kang'ethe, E., Nasinyama, G.W. and Mohammed, T. (2008). Risk assessment for E. coli O157:H7 in marketed raw and fermented milk in selected African countries. J Food Protection 27(2):257-263
- Tibbo, M., Schelling, E., Grace, D., Bishop, R., Taracha, E., Kemp, S., Ameni, G., Dawo, F. and Randolph, T. (2008). Cross-disciplinary and participatory livestock and human health research for successful control of zoonoses in the developing world. Ethiopian Journal of Health Development. 22 (Special Issue), 109-116
- Grace D., Randolph T., Omore A., Schelling E., Bonfoh B. (2008), Place of Food Safety in Evolving Pro-Poor Dairy Policy in East and West Africa. Revue d'élevage et de médecine vétérinaire des pays tropicaux. Vol 60
- Grace D, Omore A, Kang'ethe E, Nasinyama G, Randolph T. 2008, Risk analysis – an emerging ecohealth perspective? International EcoHealth Forum 2008 (IEF 2008), Merida, Dec 1st -5th, 2008
- Van Zyl, E L, McCrindle, C M E, D Grace D., 2008. Participatory risk assessment for food safety in informal markets, 54th International Congress on Meat Science & Technology, Cape Town, South Africa from 10 – 15 August 2008
- Grace D, Kang'ethe E, Omore A, Randolph T., 2008,Participatory Risk Assessment: A New Tool for Improving Smallholder Market Access and Consumer Health Tropentag 2008: Competition for Resources in a Changing World New Drive for Rural Development, October 7 - 9, 2008, Hohenheim, Germany.

Project Title:
Supporting the vulnerable: Increasing the adaptive capacity of agro-pastoralists to climatic change in West and Southern Africa using a transdisciplinary research approach (CLIMATE CHANGE)

Project Coordinator:
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Partner Institute:
Potsdam-Institut fuer Klimafolgenforschung (PIK), Potsdam, Germany, Dr Hermann Lotze-Campen;
German Institute for Tropical and Subtropical Agriculture
DITSL GmbH Witzenhausen, University of Kassel, Germany; Dr. Christian Huelsebusch, Dr. Brigitte Kaufmann;

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Collaborating Institutions:
Instituto de Investigacoes Agrarias de Mozambique, Maputo, Mozambique;
IER, Bamako, Mali;
African Union, Inter-African Bureau of Animal Resources

Region:
East Africa, Southern Africa, West Africa

Country:
Kenya, Mali, Mozambique

Thematic Priority:
Not available

Major Research Domain:
Agro-pastoralists, local communities, climate variability, rangeland, livestock

Budget:
870,000 €

Goal:
To increase the adaptive capacity of agro-pastoralists, who are one of the most vulnerable groups in Africa, to climate variability and the expected effects of future climate change

Purpose:
To co-generate methods, information and solutions between local communities, local and international scientists, policy makers and other actors involved in climate change and adaptation programmes, for coping mechanisms and adapting strategies to climate change and variability in West and Southern Africa, and more particularly in Mali and Mozambique

Outputs:
- Estimation and documentation of the effects of climate variability and change on the primary productivity of crops, rangelands and livestock, and associated livelihoods impacts
- Inventory, documentation and dissemination of past, present and possible future agro-

pastoralists coping mechanisms to deal with climate variability
- Active learning mechanisms developed, and priority livestock-based technological adaptation options for improving food security, incomes and sustainability of agro-pastoralists co-identified with communities and other stakeholders and pilot tested
- Policy entry points for supporting the implementation of priority livestock-based adaptation options in agro-pastoral systems identified and discussed with key stakeholders
- Dissemination pathways identified and implemented at different levels, to increase awareness of the likely impacts of climate variability and change, and to provide information for making decisions in relation to adaptation options for different conditions

Major Results Achieved:
not yet available (new project)

Publications:
Not available

Project Title:
Transcriptome profiling of hybrid rice

Project Coordinator:
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Partner Institute:
Max Planck Institute for Developmental Biology, Dr. Detlef Weigel, Tuebingen, Germany

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Collaborating Institutions:
none

Region:
South Asia, Southeast Asia and Pacific

Country:
Bangladesh, India, Philippines, Viet Nam

Thematic Priority:
Not available

Major Research Domain:
Genetics, plant, gene expression, hybrid, drought

Budget:
60,000 €

Goal:
- Generation of complete transcriptome maps
- In-depth analysis of 100 transcripts

Purpose:
- Generate new and unique complete transcriptome maps of one hybrid and its respective parents from the IRRI hybrid rice breeding collection
- Investigate heterosis in rice by generating transcriptome maps using a genome-wide approach based on Illumina technology available at the Max Planck Institute for Developmental Biology and signature validation based on the Ge-XP platform available at IRRI.

Outputs:
- One complete map for two parental lines of one elite hybrid, one complete map for one hybrid
- Expression signature validation for two hybrids and four parental lines under drought conditions

Major Results Achieved:
Plant samples from drought treated and well watered field grown hybrid parents were shipped to MPI on January 2009 for transcriptome analysis. A validation of the Gene Expression Profiler genetic analysis system was carried out. MPI is developing RNA-seq for

hybrids, using A. thaliana as a model system. Libraries have been generated as proof-of-principle.

Comment:
The project encountered a long delay due to human resources problems at IRRI and unavailability of the commercial equipment to be used in the proposed work.

Publications:
None so far

Project Title:
Enhancing and stabilizing the productivity of salt-affected areas by incorporating genes for tolerance of abiotic stresses in rice

Project Coordinator:
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Project Coordinator email:
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Partner Institute:
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Partner Institute email:
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Collaborating Institutions:
Central Rice Research Institute (CRRI), India
Orissa (Drs. D.P. Singh, J.N. Reddy), India
Central Soil Salinity Research, India
Institute (CSSRI), India
Karnal (Drs. G. Singh, R.K. Gautam, B.K. Bandopadhyay), India
ND University of Agriculture and Technology (NDUAT), India
Faizabad (Dr. P.C. Ram) India
Bangladesh Rice Research Institute (BRRI), Bangladesh
Gazipur (Dr. M.A. Salam), Bangladesh
Cuu Long Delta Rice Research Institute (CLDRRI; Dr. N. Lang), Vietnam

Region:
ASIA, South Asia

Country:
Bangladesh, India, Viet Nam

Thematic Priority:
Development of sustainable production systems
Increasing income from fruit and vegetables
Income increases from livestock
Rural institutions and their governance

Major Research Domain:
rice productivity
-salt stress
- tolerance of abiotic stresses
- salinity tolerance
- marker-assisted backcrossing (MAB)

Budget:
876,448 €

Goal:
To increase and stabilize food productivity and enhance livelihood and food security in salt-affected areas through salt-tolerant rice varieties.

Purpose:
- To develop and distribute to NARES varieties possessing QTLs for enhanced tolerance of salt stress, together with accompanying management options, for dissemination, with the potential to double yield under stress conditions in target areas
- to provide NARES with varieties combining tolerance of submergence and salinity for coastal areas.

Outputs:
- Varieties possessing Saltol and a combination of Saltol and Sub1: introgression of Saltol into four popular varieties completed using MAB for increased vegetative-stage tolerance and initially evaluated with NARES; lines combining Saltol with Sub1 developed and tested for both salinity and submergence tolerance.
- Additional salinity-tolerance QTLs associated with tolerance during reproductive stage identified and two additional QTLs for tolerance at vegetative stage fine-mapped using microarray genotyping technology; an optimized MAB system developed for introgressing multiple QTLs.
- Genes and alleles associated with salinity tolerance discovered through candidate gene analysis and mutant screening combined with in-depth physiological characterization.
- NARES capacity for marker-assisted breeding, large-scale phenotyping, and participatory research strengthened through degree and nondegree training.

Major Results Achieved:
To initiate the project, a planning workshop with project partner from NARES in India, Bangladesh, and Vietnam was held in India. Research activities of the project resulted in newly identified Quantitative Trait Loci (QTLs) from novel sources of salinity tolerance for both seedling and reproductive stage tolerance. Currently, there is a significant repertoire of potentially useful QTLs that will be further characterized through this project. In addition, the activities to combine salinity and submergence tolerance for improved rice varieties for coastal regions are already producing promising breeding lines at IRRI. Molecular marker laboratory protocols and materials detailing the strategies for marker-assisted breeding have been compiled by the IRRI team and different training workshops and other technology transfer activities were funded.

Comment:
In addition to the original project planning next-generation molecular marker genotyping systems will be included, i.e. high-throughput Single Nucleotide Polymorphism (SNP) genotyping will be incorporated into the research activities of the project.

Publications:
- De Ocampo MP, Thomson MJ, Egdane J, Katimbang MB, Zantua RE, Rahman MA, Sajise AG, Gregorio GB, Nejad GM, Singh RK, Ismail AM. 2008. Development of near-isogenic lines targeting salinity tolerance QTLs derived from salt-tolerant variety Pokkali. Poster presented at the 38th Crop Science Society of the Philippines, 12-16 May 2008, Iloilo City, Philippines.
- Nakhoda B, Katimbang MB, Egdane J, Zantua RE, Thomson MJ, Leung H, Ismail AM. 2008. A knockout mutant population for forward and reverse genetics for salt tolerance in rice. Poster presented at the 38th Crop Science Society of the Philippines, 12-16 May 2008, Iloilo City, Philippines.
- Thomson MJ, Ismail AM, McCouch SR, Mackill DJ. 2009. Marker-Assisted Breeding. In: Abiotic Stress Adaptation in Plants: Physiological, Molecular and Genomic Foundation, Chapter 20; (in press)

Project Title:
"Rice and global climate change: candidate genes for preventing heat- and drought-induced yield losses due to spikelet sterility"

Project Coordinator:
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Partner Institute:
Max Planck Institute of Molecular Plant Physiology, Central Infrastructure Group Transcript Profiling, 14476 Postdam, Germany

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Collaborating Institutions:
Not available

Region:
ASIA

Country:
Philippines

Thematic Priority:
Not available

Major Research Domain:
Molecular plant breeding, molecular biology, proteomics, climate change, abiotic stress tolerance genes

Budget:
60,000 €

Goal:
The major goal of this project is the alleviation of global food insecurity, poverty, and malnutrition in potentially highly food- and climate-insecure regions of the world.

Purpose:
The purpose is the development of rice cultivars that are tolerant of heat, drought, and combined
heat and drought stress through the introgression of validated tolerance genes into rice mega-varieties by marker-assisted breeding.

Outputs:
1. Detailed sequence information and expression data on a set of heat- and droughtresponsive
genes from tolerant and intolerant rice accessions
2. Transgenic plants (T0) for functional validation of putative tolerance genes
3. Effect of drought on spikelet sterility established
4. Increased understanding of the cross-talk between heat and drought stress and underlying physiological processes (e.g., carbohydrate metabolism)
5. Gene-specific PCR-based markers available for breeders

6. Training of at least one MSc student at MPI and at IRRI
7. At least one publication in an international peer-reviewed journal

Major Results Achieved:
Heat tolerance candidate gene sequences were analyzed in detail at gene databases. Design of gene-specific primers for a set of candidates from the spikelet proteomics has been completed. To assess cross talk between heat and drought stress, an experiment was conducted using two heat and drought-tolerant rice accessions, a drought tolerant and heat susceptible variety, a drought tolerant upland rice variety and a drought and heat susceptible variety. Plants were exposed to heat, drought, and combined drought and heat stress coinciding with the anthesis stage. First results suggest that different tolerance mechanisms are operating in the drought and heat-tolerant rice genotypes during anthesis.

Publications:
- Jagadish SVK, Muthurajan R, Oane R , Wheeler TR, Heuer S, Bennett J and Craufurd PQ. 2009. Physiological and proteomic approaches to address heat tolerance during anthesis in Rice (Oryza sativa L.) Submitted to Journal of Experimental Botany.
- Wassmann R, Jagadish SVK, Heuer S, Ismail A, Redoña E, Serraj R, Singh RK, Howell G, Pathak H and K. Sumfleth. 2009a. Climate Change Affecting Rice Production: The Physiological and Agronomic Basis for Possible Adaptation Strategies. Advances in Agronomy. 101 59-122.
- Wassmann, R Jagadish SVK, Sumfleth K, Pathak H, Howell G, Ismail A, Serraj R, Redoña E, Singh RK and Heuer S. 2009b. Regional Vulnerability of Climate Change Impacts on Asian Rice Production and Scope for Adaptation. Advances in Agronomy. 102. In press.

Project Title:
Improving Water Productivity of Crop-Livestock Systems of Sub-Saharan Africa

Project Coordinator:
Dr. Tilahun Amede, IWMI, 127, Sunil Mawatha, Pelawatte, Battaramulla, Sri Lanka

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Partner Institute:
Center for Development Research (ZEF)

Partner Institute email:
Not available

Collaborating Institutions:
International Livestock Research Institute (ILRI), Ethiopia
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Zimbabwe
Amhara Regional Agricultural Research Institute (ARARI)

Region:
East Africa, Southern Africa

Country:
Ethiopia, Zimbabwe

Thematic Priority:
Income increases from livestock
Integrated land, water and forest management at landscape level

Major Research Domain:
water productivity, crop-livestock systems, livestock management

Budget:
1,200,000 €

Goal:
The goal of this project is to improve livelihoods of smallholder farmers in mixed crop-livestock systems, and mitigate land degradation of the semi-arid of Sub-Saharan Africa through increased productivity o fwater and improved governance of water resources. This coincides with IWMI´s mission to improve water and land resources management for food, livelihoods and nature, and IWMI, ICRISAT and ILRI´s commitment to the CGIAR priorities to develop livestock related options to improve management, conservation and use of water in Sub-Saharan Africa.

Purpose:
The project´s purpose is to develop and promote options for enhancing water productivity in the semi arid areas based on improved management options for livestock in mixed farming systems.

Outputs:
- Assessment of drivers for change in water use at the landscape scale, focusing on relief efforts, small scale irrigation development, intensified annual cropping, and markets.
- Water governance profiles in the study sites and an assessment of the effectiveness of informal and formal arrangements, and their interface, for intergrated water management in

crop-livestock systems.
- Water Productivity (WP) framework adapted for crop-livestock systems, that can be applied at farm, system or landscape scale.
- WP gap analysis´for study areas that will identify entry points for improved WP.
- Multiple-use technology options for crop-livestock systems that optimize gender, livelihood, and poverty impacts.
- Technology and governance recommendations and increased capacity for improving water productivity in crop-livestock systems

Major Results Achieved:
A strong partnership with national, regional and international actors working on livestock and water interactions has been created. The available global knowledge in the area of improved natural resources management, particularly related to livestock and water interactions has been assembled during a global workshop in Ethiopia in September 2007. Key messages from the workshop were the following: 1. Integrating livestock and water development can reduce pressure on scarce water resources while reducing poverty. 2. Water productivity in mixed crop-livestock systems compares favourably with that in irrigated horticulture. 3. With increasing water scarcity, increasing the productivity of water is the right path to intensify agricultural production and reduce environmental degradation in both irrigated and rain fed areas. 4. Retaining rangeland instead of converting it into annual cropland is supposed to lead to more efficient use of water and to be environmentally more sustainable. The key lessons learned from the various workshops are under development as policy briefs and flyers to make institutions and policy makers aware of the livestock-water issues in crop-livestock systems of Sub-Saharan Africa. An impact pathway has been designed to be used as a tool during the project period in order to increase sustainability after completion of the project.

Publications:
- Tilahun Amede, 2007. Multiple effects of Small Scale Irrigation in Ethiopia. A paper presented at “Impact of irrigation on poverty and environment in Ethiopia”. A national workshop organized by IWMI, Nov 27-29, 2007, Addis Ababa, Ethiopia.
- Tilahun Amede, 2007. Enabling Adoption of Livestock-Water Interventions in Crop-Livestock Systems of SSA. A paper presented at the workshop “ Harnessing Water Productivity in Crop-Livestock systems of Sub-Saharan Africa through improved Livestock and Water Interventions”. A global workshop organized by IWMI and ILRI. Sept 24-29, 2007. Addis Ababa, Ethiopia.
- Tilahun Amede, 2007. Enhancing Water Productivity in Crop-Livestock Systems. A paper presented to IWMI Board and IWMI ARM. Oct 22, 24, 2007. Colombo, Sri Lanka.
- Tilahun Amede, 2007. Lead paper. Livestock and Water Management Innovations to Enhance Water Productivity in Ethiopia: Concepts and Practices. Panel paper for the annual meeting of Ethiopian Association of Agricultural Professionals. July 13, 2007, EIAR, Addis Ababa, Ethiopia
- Tilahun Amede, 2008. “Enhancing Water Productivity in Sub-Saharan Africa: Concepts and Practices”. ICRISAT, Bulawayo, Zimbabwe.
- Tilahun Amede, Amare Haileslasie, Don Peden, Seleshi Bekele, Michael Blümmel, and Mario Herrero, 2007. Integrating land and water management in smallholder livestock systems in Sub Saharan Africa. World Bank resource book on “Sustainable Land Management principles”. In press.
- Tilahun Amede, Habtemariam Kassa, Gete Zeleke, Abebe Shiferaw, Simon Kisumu and Melesse Teshome, 2007. Working with communities and Building local institutions for Sustainable land management in the Ethiopian Highlands. Mountain Research and Development, Volume 27 (1) 15-19. Berne, Switzerland.

Project Title:
Re-thinking water storage for climate change adaptation for sub-Saharan Africa (CLIMATE CHANGE)

Project Coordinator:
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Partner Institute:
Center for Development Research (ZEF), Dr. Peter Mollinga, Dr. Wolfram Laube, Dr. Irit Eguavoen;
Potsdam Institute for Climate Impact Research (PIK), Dr. Zbigniew Kundzewicz, Dr. Holger Hoff;

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Collaborating Institutions:
EEA -Ethiopian Economic Association / Ethiopian, Economic Policy Research Institute, Addis Ababa, Ethiopia;
AMU- Arba Minch University / Institute of Water Technology, Ethiopia;
Water Research Institute (WRI), Accra, Ghana;
Institute of Statistical, Social and Economic Research (ISSER), University of Ghana;

Region:
East Africa, Europe, West Africa

Country:
Ethiopia, Germany, Ghana

Thematic Priority:
Not available

Major Research Domain:
Not available

Budget:
1,120,000 €

Goal:
To improve livelihoods and increase resilience of rural poor in SSA vulnerable to climate change risks through better water storage mechanisms, improved investments and institutional support

Purpose:
To guide policy and investment decisions of international development agencies, state bodies, NGOs, private funding institutions and local authorities towards storage options and strategies that ensure optimal adaptation to CC-induced impacts on water availability in SSA

Outputs:
- Assessment of social, economic, biophysical, health and environmental impacts of a range of water storage options in selected study areas - (Ghana-Volta and Ethiopia-Blue Nile)-a baseline ‘component analysis’

- Analysis of resilience of storage options under specified CC scenarios - system perspective
- Analysis of investment scenarios and associated risks under specified CC scenarios – basin perspective
- Guidelines for i) selection of suitable water storage options aimed at improving resilience and risk reduction for farming communities ii) evaluation of enabling socio-political and institutional conditions; iii) investments strategies; iv) implementation processes

Major Results Achieved:
After an inception workshop in Ethiopia and a project planning meeting in Ghana a preliminary conceptual framework has been developed. This provides a basis for assessing different physical water storage options within a continuum of options to adapt to climate change impacts on water resources. Baseline information on different water storage types has been collected in both Ghana and Ethiopia. Case study sites have been selected in both countries. Basic climate and flow data have been obtained and archived. The project website has been set-up under the IWMI site (http://africastorage-cc.iwmi.org/Default.aspx).

Publications:
- Amisigo, B. 2008. Inventory of existing water storage types, their characteristics and distribution in the Volta basin (draft report)
- Arba Minch University 2009 Inventory of existing water storage types, their characteristics and their distribution in the Blue Nile Basin (draft report)
- Asante F. 2008. Technical, financial and economic performance of small dams in Ghana (draft report)
- Irit Eguavoen, 2009 The Acquisition of Water Storage Facilities in the Abay River Basin, Ethiopia (draft report)

Project Title:
Development of fast screening methods for developing countries to improve quantity and quality of carbohydrates in potato, sweetpotato and yambean

Project Coordinator:
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Partner Institute:
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Collaborating Institutions:
Not available

Region:
ANDEAN PACT

Country:
Peru

Thematic Priority:
Not available

Major Research Domain:
Developing countries, Peru, carbohydrates, potato, sweetpotato, Andean yambean, NIRS

Budget:
60,000 €

Goal:
The goal of this study will be to develop a fast and inexpensive near-infrared reflectance spectroscopy
(NIRS) screening method for predicting quantity and quality of plant carbohydrates (CHO), on the
basis of investigation into the quantity and quality of plant CHO in potato (modern and Andean
Solanum groups), sweetpotato and Andean yambean grown in Peru. The new developed method will
be applied by an existing global NIRS network to predict quantity and quality of plant CHO simultaneously with other traits.

Purpose:
The applicants working group has accumulated considerable expertise in starch analysis, however, which could be used to generate comprehensive data relating to the CIP germplasm's CHO-quantity and -quality. These data could then be used as reference values for NIRS calibration development by CIP.
The proposed cooperation with CIP would be an important step towards integrating plant quality research into breeding strategies for more efficient use of plant
genetic resources, to enhance the nutritional and industrial value of potato, sweetpotato and

Andean yambean. CIP foresees that combining newly developed NIRS calibrations for CHO-quantity and -quality characteristics, with recently developed calibrations for other traits across the existing global CIP-NIRS network will boost selection efficiency and help to maximize the genetic gains made for these crops.

Outputs:

1. Plant CHO variability characterized in modern and Andean Solanum groups, sweetpotato and
   Andean yambean grown in different environments in Peru.
2. NIRS models developed for fast inexpensive characterization of CHO-quantity and -quality characteristics by a global NIRS network.
3. Scientific manuscript and plan for further research partnership with CIP.

Major Results Achieved:

Not available

Publications:

Not available

Project Title:
Development of novel management techniques for Phyllotreta striolata (F.) in crucifer crops - Impact of glucosinolate, their hydrolysis products and male-derived aggregation pheromones

Project Coordinator:
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Project Coordinator email:
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Partner Institute:
AVRDC - The World Vegetable Center, Tainan, Taiwan;

Partner Institute email:
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Collaborating Institutions:
None

Region:
Europe, Southeast Asia and Pacific

Country:
Germany, Taiwan

Thematic Priority:
Not available

Major Research Domain:
Glucosinolates and hydrolysis products, trap crops, aggregation pheromones, host plant volatiles, chemical ecology, mass trapping

Budget:
60,000 €

Goal:
To contribute to sustainable vegetable brassica production in the tropics

Purpose:
Effective trap to monitor P. striolata in the field and improve vegetable Brassica production and reduced pesticide use

Outputs:
- Most effective trap crops identified
- Effects of glucosinolates and hydrolysis products on P. striolata
- Glucosinolate hydrolysis product lures developed
- Volatile organic compounds from most preferred host plants of P. striolata identified and lures developed
- Aggregation pheromone from males of P. striolata identified and lures developed

Major Results Achieved:
not yet available (new project)

Publications: None so far

Project Title:
Plant processes regulating tuber micronutrient concentrations of potato genotypes in different environments

Project Coordinator:
Prof. Dr. C. Engels, Department of Plant Nutrition; Humboldt-University Berlin

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Partner Institute:
International Potato Center; Dr Merideth Bonierbale; Lima, Peru

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Collaborating Institutions:
Not available

Region:
LATIN AMERICA

Country:
Peru

Thematic Priority:
Not available

Major Research Domain:
Plant nutrition, plant breeding, nutritional quality

Budget:
58,400 €

Goal:
The project goal is advancing the understanding of plant processes that regulate Fe and Zn content of potato tubers. This will help to increase micronutrient contents through agronomic intervention and genetic selection, and may contribute to reduce malnutrition among rural populations in low-income countries.

Purpose:
In current field trials of CIP´s Germplasm Enhancement and Crop
Improvement Division in Peru whole plant micronutrient accumulation and micronutrient distribution between haulms and tubers will be measured to assess the roles of acquisition from soil and remobilization within plant for genotypic variation of tuber micronutrient concentrations
in different environments. In pot experiments in Lima and Berlin with a few selected genotypes, nutrient supply and haulm senescence will be specifically varied to collect further information about the processes that control tuber micronutrient concentration.

Outputs:
- Characterization of the variability of micronutrient acquisition from soil and remobilization from haulms to tubers in potato genotypes growing under differing environmental conditions

• Identification of plant traits relevant for micronutrient concentrations in potato tubers
• Manuscript and proposal for research cooperation with CIP

Major Results Achieved:
not yet available (new project)

Publications:
Not available

Project Title:
Small-scale producers´ adaptation to climate risk in the Brazilian Amazon: Promoting knowledge-to-action through collaboration in research and technical cooperation

Project Coordinator:
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Partner Institute:
CIAT, CIFOR

Partner Institute email:
Not available

Collaborating Institutions:
Federal University of Parà - UFPA, Association of Amazon Universities - UNAMAZ, GTZ local office Belém (Brazil)

Region:
South America

Country:
Brazil

Thematic Priority:
Not available

Major Research Domain:
Climate Change, Adaptation, Value chains, Risk Analysis, Brazilian Amazon, local communities

Budget:
59,829 €

Goal:
Not available

Purpose:
Not available

Outputs:
Not available

Major Results Achieved:
During the first two months project work focused on identification of suitable student candidates at ITT and Brazilian Universities through competitive calls and presentations in graduate and undergraduate courses, formal involvement of local government institutions at the state level in the project and literature research.

Publications:
None so far

Project Title:
Forest fire management in India: integrating ecological and cultural contexts and consequences

Project Coordinator:
Prof. Dr. Juergen Bauhus, Dr. Joachim Schmerbeck, Albert-Ludwigs-University of Freiburg, Tennenbacher Str. 4, 79085 Freiburg

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Partner Institute:
Center for International Forestry Research (CIFOR), Dr. Douglas Sheil;

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Collaborating Institutions:
Not available

Region:
South Asia

Country:
India

Thematic Priority:
Integrated land, water and forest management at landscape level

Major Research Domain:
Fire, forest, ecosystem services, biodiversity, livelihoods, conservation, carbon sequestration;

Budget:
59,982 €

Goal:
To inform improved forest fire policy allowing for more effective conservation and management of Indian forest, and to sensitize different constituencies to the ecoloical and socio-economic and cultural roles fo fire

Purpose:
To develop a proposal for a national-level study on wild fires in India, with the aim of developing an in-depth information base on fires in Indian forests.

Outputs:
- To document fire occurence inthree sites of India, whcih will be located in three different eco-regions in India (Western Himalayas, Western Ghats and the plains of central India)
- To examine the correlation of fire occurence with different forest types
- To assess the effects of fires of varying frequency on forest structure and functioning on the basis of satellite imagery and other available data
- To identify the reasons for forest fires, their link to existing forest formations, and their role in the supply of ecosystem services (ES)

Major Results Achieved:
After selecting three sites for operation, contacting respective partners in the field and establishing linkages with the forest administration on the national level, all project partners, representatives of the Ministry of Environment and Forest as well members of the project advisory board met in Delhi to discuss the content and ways forward of the project. Literature about forest fires and the relationship between forest fire and ecosystem services was collected and compiled in an EndNote data base. The literature and the data base are available on the Project Internet platform (BSCW) for project partners. Field studies have shown the broad and intensive use of fire in Indian forest and their importance for obtaining a large variety of forest products and other services. The preference for patches to burn as well as the motivation behind setting fires varies strongly even on a small spatial scale. As a result almost the entire landscape in which the field work was conducted is shaped by the forest fires. Changes in the ecosystems after reducing fire intensity are not predictable but show a clear reduction in the provision of ecosystem services from the forest. A workshop was conducted to train project partners on fire ecology. CIFOR staff gave an introduction into Multidisciplinary Landcape Assessment (MLA). A first set of MLA tools was selected, tested in the field and the results analysed and discussed. The first draft of a Fire MLA manual was established. The project takes special care to build linkages with the forest department, responsible for fire management, at the national and local level. The main project partner in India organised together with the Ministry of Environment and Forests a national workshop on forest fires: “Rethinking Forest Fires” in November 2007. A project web page has been designed which will be published after further development.

Publications:
none so far

Project Title:
Study of the antidiabetic properties of Momordica charantia

Project Coordinator:
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Collaborating Institutions:
Not available

Region:
Southeast Asia and Pacific

Country:
Taiwan

Thematic Priority:
Not available

Major Research Domain:
Plant and health, insulin resistance, vegetables, supplements and functional food

Budget:
43,150 €

Goal:
To improve the quality and efficacy of bitter gourd supplementation for reduced hyperglycemia in resource-limited, high diabetic prevalent areas

Purpose:
To better understand the antidiabetic properties of bitter gourd from a biochemical aspect; and to verify the efficacy of bitter gourd varieties selected by in vitro antidiabetic methods

Outputs:
- Bioactive fraction of bitter gourd that shows the strongest antidiabetic properties identified
- Mode of actions of the antidiabetic properties of bitter gourd understood
- Antidiabetic activity of potential bitter gourd accessions for supplementation verified in vivo

Major Results Achieved:
Different Momordica charantia (bitter gourd) fractions were extracted. The dried crude extracts were dissolved in water. To investigate the anti diabetic properties of these extracts diabetic mice were administered either the lipid fraction or the saponin fraction or the hydrophilic residue or a whole fruit powder at a daily oral dose of 150 mg per kg body weight for five weeks. The control group received pure water instead. At the beginning of the animal trial the mean body weight of the mice did not differ within the five groups used in the trial. Although all animals became overweight and developed diabetes during the trial, all bitter

gourd treated mice had a lower weight gain and lower blood glucose levels than the control group. As reliable parameter the amount of glycated haemoglobin will be analyzed now.

Publications:
None so far

Project Title:
Adaptation of Landuse to Climate Change in Sub-Saharan Africa (CLIMATE CHANGE)

Project Coordinator:
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Partner Institute:
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Collaborating Institutions:
Institut de l'Environnement et de Recherches Agricoles (IERA) Ouagadougou, Burkina Faso;.
Direction de la Météorologie / Ministère des Transports Ouagadougou, Burkina Faso;
Laboratoire de Ecologie / Université d´Ouagadougou: S. Guinko ; and Centre Régional, Burkina Faso;
AGRHYMET, Niger;
Centre for Interdisciplinary Africa-Research (ZIAF), Frankfurt/Main, Germany;

Region:
West Africa

Country:
Burkina Faso

Thematic Priority:
Not available

Major Research Domain:
Not available

Budget:
1,200,000 €

Goal:
Development of a data and knowledge base that gives easily accessible information to assist local land-users in adapting to climate change in their specific region

Purpose:
Assist local farmers and every kind of land-user to adapt their land use practices to expected climate-change

Outputs:
- Atmospheric models for short term forecasts and long term projections for regional and local scales
- Adaptation of SVAT-models to local vegetation types
- Energy budget model for ruminant units in their different environments
- Digital maps of vegetation distribution and environmental factors on larger scales
- Digital maps of biophysical structures of individual plants on a small scale
- Data base of leaf water potentials, of sap flows and of photosynthetic respond curves for

different plants
- Set of values for 3D-short and long wave radiation within vegetation types
- Data base of energy of fodder-plants and the contribution of excrements to soil fertilization

Major Results Achieved:
Topographic and thematic maps were acquisitioned and georeferenced and Satellite Images were obtained. A workflow for cost-saving use of high resolution Google Earth images for field work preparation was developed. A processing chain for the classification of high resolution satellite images was developed, and is being tested. Out of the available maps a digital Burkina Faso GIS Atlas was developed which is meant as a tool for field work planning, and as tool for sharing geo information between sub projects. A network of 53 investigation sites was set up to characterize the whole area of Burkina Faso. Based on the available information 6 stations out of 53 were pre-selected to characterize 3 natural zones of Burkina Faso. A network of automatic meteorological stations measuring climate variables was installed. A complete climate scenario data set was downloaded and processed and is ready for regionalization. A project Homepage has been set up: www.aluccsa.de.

Publications:
- Bayala J., et al., 2008 ALUCCSA poster at GLOWA-Conference
- Kalinganire, A. and J. Bayala: Trip Report on fieldwork in Burkina Faso for sites selection for the implementation of ALUCCSA project.

Project Title:
Developing rice and sorghum crop adaptation strategies for climate change in vulnerable environments in Africa - RISOCAS (CLIMATE CHANGE)

Project Coordinator:
University of Hohenheim, Institute of Crop Production and Agroecology in the Tropics and Subtropics, Dept. Crop Water Stress Management, Garbenstr. 13, 70599 Stuttgart, Germany, Prof. Dr. Folkhard Asch, Prof. Dr. Georg Cadisch;

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Partner Institute:
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Partner Institute email:
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Collaborating Institutions:
CIRAD, Montpellier, France, Senegal, Madagascar;
Institut d'Economie Rurale (IER), Mali
FOFIFA, Madagascar

Region:
Europe, West Africa

Country:
Benin, France, Germany, Senegal

Thematic Priority:
Tolerance to selected abiotic stresses

Major Research Domain:
Rice, sorghum, climate change, variety development, crop mangement, crop models

Budget:
1,010,000 €

Goal:
To provide operational methodology to measure the impact of climate change scenarios on crop responses for key cereal-based systems of Africa

Purpose:
To enable policy makers in agricultural research to develop strategies to adapt African agriculture to climate change and to help producers to tactically adapt their system to increased climate variability

Outputs:
- Characterization and validation of genotypic traits enhancing water saving management practices for irrigated rice in the Sahel
- Characterization and validation of genotypic, morphological traits for adaptation to unreliable rainfall patterns and water acquisition in rainfed Sorghum
- Characterization and validation of genotypic, physiological traits to reduce water losses

under unreliable water availability in rainfed upland rice
- Field testing of a large number of genotypes and establishment of a database on genotypic phenological responses to a large number of different environments
- Development, validation and application of a suitable, modeling based methodology to predict the impact of different climate scenarios on existing and hypothetical crop varieties
- Workshops and training

Major Results Achieved:
Field based activities were coordinated and synchronized during a kick-off workshop in Senegal. A thesis project on simulation-modelling was initiated. Specific methodologies and protocols for microclimate characterization in irrigated rice systems were developed, as well as explicit concepts for crop model adaptation for RISOCAS purposes. Field trials on irrigated rice were established in Senegal including a water saving trial. Studies on rainfed sorghum were implemented in Mali at three sites covering a latitudinal and rainfall gradient. The major activity was to characterize the genotypic and morphological traits for sorghum adaptation to unreliable rainfall patterns. Field trials on rainfed rice started in Madfgaascar. The RISOCAS project website (www.risocas.de) serving as central communication and information platform was established and updated frequently.

Publications:
latitudinal and precipitation gradients in Mali, ICRISAT, Bamako, May 2008 – Presentation.
- Giese, M.: The RISOCAS project. Introduction of the project to African visitors from the “Brot für die Welt” counterparts. Tropenzentrum der Universität Hohenheim, September 2008 – Presentation.
- Stürz, S., Schlegel, I., Sow, A. Asch, F.: Physiological response of lowland rice cultivars to the standard soil culture system. In: Competition for resources in a changing world: New drive for rural development, Proceedings of Tropentag 2008, Hohenheim, Germany, p. 488.

Project Title:
Lessons from the tsunami 2004 in Aceh: Mitigation or aggravation through trees? Modeling the effect of coastal vegetation on tsunami impact in West Aceh, Indonesia

Project Coordinator:
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Partner Institute:
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Collaborating Institutions:
Not available

Region:
Southeast Asia and Pacific

Country:
Indonesia

Thematic Priority:
Not available

Major Research Domain:
Tsunami, agroforestry services, disaster mitigation, modeling, risk assessment and prevention

Budget:
59,257 €

Goal:
A modeling tool that can assist coastal land-use planners in developing safer and economically viable vegetation barriers to mitigate the impact of a potential future tsunami.

Purpose:
To develop a robust model, an improved version of the existing one (Laso Bayas 2007) that explicitly considers the role of coastal vegetation as a tsunami mitigating factor. Additional data and evidence from a wider coastal area will be collected to validate and improve the model. Given the homogeneous off-shore factors (important to determine tsunami strength) of the West Aceh and surrounding coastal areas (such as bathymetry, coastal orientation and distance to epicenter), the area is ideal to validate the model in the field as well as to further develop it.

Outputs:
1. Land cover patterns and their change due to the tsunami event determined
2. Improved vegetation resistance factor developed
3. Improved model on the mitigation provided by coastal vegetation on a tsunami event and

its interactions with other factors is operative
4. Test trial of the developed model

Major Results Achieved:
Not available

Publications:
Not available

Project Title:
Individual and combined effects of five quantitative trait loci on resistance to the parasitic weed Striga hermonthica in Sorghum bicolor under field conditions in Mali and Sudan

Project Coordinator:
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Partner Institute:
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Bamako (Mali) & Nairobi (Kenya)

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Collaborating Institutions:
Institut d'Economie Rurale (IER) - Mali, Agricultural Research Corporation (ARC) - Sudan, Kenya Agricultural Research Institute (KARI), Department of Agricultural Research & Human Resource Development (DARHRD), - Eritrea

Region:
Sub-Saharan Africa (SSA)

Country:
Eritrea, Kenya, Mali, Sudan

Thematic Priority:
Not available

Major Research Domain:
Producing more and better food at lower cost through genetic improvements
Biotic stress, Striga hermonthica, Sorghum bicolor, Breeding, Resistance, Marker Assisted Backcrossing

Budget:
60,000 €

Goal:
The resulting unique set of sorghum genotypes introgressed with different quantitative trait loci (genes) for striga resistance offer the exceptional possibility to investigate effects of the five different gene loci individually and in combination. It has therefore a high potential for developmental impact through more targeted plant breeding for striga resistance in sorghum and offers the possibility to identify adapted genotypes of sorghum with stable striga resistance which can be used directly as improved cultivars in four countries of Africa.

Purpose:
Analyse the individual and combined effect of 5 QTL for striga resistance in sorghum for future integrated striga management through MABC, and assist four NARS to verify the value of developed Striga resistant FPSVs to justify release into seed systems in Mali, Eritrea, Kenya and Sudan

Outputs:
Output 1: Availability of BC2S2-introgression lines with single- and multiple-QTL in different farmer-preferred backgrounds
Output 2: Information on the effectiveness of individual QTL in relation to field performance across genetic backgrounds and striga ecotypes
Output 3: Information on interactions between QTL (epistasis) for striga resistance on yield performance under striga-infested conditions
Output 4: Information on farmers' appreciation of superior lines and researchers' score of landrace trait recovery
Output 5: Availability of superior lines in terms of yield and stability/effectiveness of QTLs for striga resistance

Major Results Achieved:
not yet available (new project)

Publications:
Not available

Project Title:
Trees in multi-use landscapes in South-East Asia (TUL-SEA): A negotiation support toolbox for integrated natural resource management

Project Coordinator:
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Project Coordinator email:
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Partner Institute:
Institute for Plant Production and Agroecology in the Tro¬pics and Subtropics, Prof. Dr. Georg Cadisch;
Institute for Agricultural Economics and Social Sciences in the Tropics and Subtropics, Prof. Dr. Matin Qaim;

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cadisch@uni-hohenheim.de; qaim@uni-hohenheim.de

Collaborating Institutions:
SEANAFE (network on agroforestry education) universities in each country plus site-level NGO's plus local government (planning) agencies

Region:
Southeast Asia and Pacific

Country:
Indonesia, Philippines, PR China, Thailand, Viet Nam

Thematic Priority:
Increasing income from fruit and vegetables
Integrated land, water and forest management at landscape level

Major Research Domain:
tree crops, multi-use landscapes, intergrated natural resource management, trade off analysis

Budget:
1,000,000 €

Goal:
Local resource managers in mul¬ti-use landscapes with trees use cost-effective, replicable tools and approaches to appraise the likely im¬pacts of new technologies and changes in market access and to support evidence-based negotiations of contentious issues

Purpose:
Not available

Outputs:
- 15 cost-effective iNRM case studies in a wide range of conditions in SEA
- Local capacity on trade-off analysis to support evidence-based iNRM negotiations and ex ante impact assessments
- A Negotiation Support Toolbox (NST) of appraisal instruments, and trade-offs and scenario-based models tested and integrated

Major Results Achieved:
Tools and methods for improvements in agricultural productivity and environmental services in multi-use landscapes with trees were developed. A set of 15 methods was described at the level of 4-page flyers. A Quick Biodiversity Survey (QBS) protocol was developed and tested twice. A study was conducted in North Sumatra to test the RAFT (Rapid Appraisal of Agro-Forestry Practices and Technology) method which has been designed by project staff to develop recommendations on priority options for technological intervention to increase the value of a tree based system for improving local livelihood. Six training of trainers courses were conducted so far. Five tools were implemented by partners in five locations in Indonesia. Five potential sites have been selected for implementation of project tools in Vietnam. In the Philippines, 14 sites have been identified. A survey on use of simulation models for natural resource management by stakeholders was conducted. The TUL-SEA project involved numerous national and international partners to broaden the network and promote TUL-SEA tools. The project assisted in the assessment of an organic coffee plantation in Indonesia by providing a study of the possibility of improving robusta organic coffee. A project website is available at http://www.worldagroforestry.org/sea/projects/tulsea/.

Publications:
- Baon, JB. and Wibawa A. 2008. Pengembangan Kopi Robusta Organik dalam Rangka Revitalisasi Kopi Ulu di Nagari Paninggahan, Kecamatan Junjung Sirih, Kabupaten Solok, Sumatera Barat (Organic Robusta Coffee Development for “Kopi Ulu” Revitalization in Nagari Paninggahan, Junjung Sirih Sub-District, Solok District, West Sumatera). Indonesian Coffee and Cacao Research Institute (ICCRI) and World Agroforestry Centre - ICRAF, SEA Regional Office.
- Harja D, Wisnubroto EI, Kurniasari V, Hairiah K and van Noordwijk M. 2008. The Dark Side of SExI-FS: Tree Roots as Landslide Anchor. Bogor, Indonesia. World Agroforestry Centre - ICRAF, SEA Regional Office.
- Harto Widodo R, Mulyoutami E, Farida , Jeanes K, Lusiana B, Joshi L and van Noordwijk M. 2007. Rapid hydrological appraisal - step 2. Bogor, Indonesia. World Agroforestry Centre-ICRAF, SEA Regional Office.
- Jihad. 2008. Keanekaragaman Jenis Burung pada Beberapa Tipe Agroforestri dan Hutan di Sekitar Kawasan Sibulan-Bulan, Batangtoru, Sumatera Utara (Birds Biodiversity Survey in Several Types of Agroforestry and Forest in Sibulan-Bulan, Batangtoru, North Sumatera). World Agroforestry Centre - ICRAF, SEA Regional Office.
- Joshi L, Nurhariyanto , Prasetyo PN, Martini E and Wulandari D. 2008. A Quick Biodiversity Survey (QBS) for Rapid Agro-Biodiversity Appraisal (RABA). Bogor, Indonesia. World Agroforestry Centre - ICRAF, SEA Regional Office.
- Kartiwa B and van Noordwijk M. 2008. Pemantauan Kondisi Iklim dan Hidrologi DAS Paninggahan di Nagari Paninggahan. World Agroforestry Centre - ICRAF, SEA Regional Office.
- Kurniatun Hairiah and Subekti Rahayu. 2007. Pengukuran karbon tersimpan di berbagai macam penggunaan lahan. World Agroforestry Centre - ICRAF, SEA Regional Office, Bogor, Indonesia. 77p.
- Lusiana B, Widodo R, Mulyoutami E, Adi DK and van Noordwijk M. 2008. Assessing Hydrological Situation of Talau Watershed, Belu Regency, East Nusa Tenggara. World Agroforestry Centre - ICRAF, SEA Regional Office, Bogor, Indonesia. Working Paper No. 58:72p.
- Lusiana, B., van Noordwijk, M. and Cadisch, G. Negotiation support tools: linking science and policy. Poster presentation at International Symposium ‘Interdependencies between upland and lowland agriculture and resource management‘, 7-8 October 2008, University of Hohenheim, Stuttgart, Germany.
http://www.tropentag.de/2008/abstracts/links/Lusiana_voDeYrwa.php
- Martini, E., Rahmanulloh A. and Mulyoutami E. 2008. Trip Report to North Sumatra for Sugarpalm Agroforestry Study: “We are from PBR (Partai Bargot Rakyat)”. Batang Toru Watershed Area, 23 November-6 December 2008. World Agroforestry Centre - ICRAF, SEA Regional Office.
- Nurhariyanto and Prasetyo PN. 2008. Metode Survey Cepat Keanekaragaman (Quick

Biodiversity Survey Method). World Agroforestry Centre - ICRAF, SEA Regional Office.
- Nurhariyanto, Joshi L and Martini E. 2008. Dung beetles (Coleoptera; Scarabaeoidea) diversity: indicator of animal diversity? Bogor, Indonesia. World Agroforestry Centre - ICRAF, SEA Regional Office.
- Nurhariyanto. 2008. Survey Biodiversitas Kumbang Tinja (Coleoptera: Scarabaeidae, Aphodiidae & Trogidae) dan Primata pada Agroekosistem Karet (Biodiversity Survey for Dung Beetles and Primates in Rubber Agro-ecosystem). World Agroforestry Centre - ICRAF, SEA Regional Office.
- Prasetyo PN, Joshi L and Martini E. 2008. Bats as environmental service providers in Bungo, Jambi, Indonesia. Bogor, Indonesia. World Agroforestry Centre - ICRAF, SEA Regional Office
- Prasetyo PN. 2008. Survey Keanekaragaman Jenis Kelelawar dan Mamalia Kecil (Biodiversity Survey for Bats and Small Mammals). World Agroforestry Centre - ICRAF, SEA Regional Office.
- Report on “Estimasi Karbon Tersimpan di Lahan-lahan Pertanian di DAS Konto, Jawa Timur” (Carbon Stock Estimation at Agricultural Area of Konto Watershed, East Java), by University of Brawijaya (in Bahasa Indonesia)
- van Noordwijk M and Wulandari D. 2008. Trees in multi-Use Landscapes in Southeast Asia (TUL-SEA): A negotiation support toolbox for Integrated Natural Resource Management (INRM). Bogor, Indonesia. World Agroforestry Centre - ICRAF, SEA Regional Office.
- van Noordwijk M and Wulandari D. 2008. Trees in multi-Use Landscapes in Southeast Asia (TUL-SEA): A negotiation support toolbox for Integrated Natural Resource Management (INRM) (Vietnamese version). Bogor, Indonesia. World Agroforestry Centre - ICRAF, SEA Regional Office.
- Widodo R.H. 2008. Penerapan Kaji Cepat Hidrologi (RHA): "Analisis Hidrologis dan Tutupan Lahan (Land Cover) Kawasan Rinjani, Lombok by WWF Indonesia” (in Bahasa Indonesia). Documentation Process. World Agroforestry Centre - ICRAF, SEA Regional Office.

In addition, more than 20 flyers have been produced.

Project Title:
Improving soil management recommendations for smallholder farmers in sub-Saharan Africa using new infrared technology for rapid diagnosis of soil constraints

Project Coordinator:
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Partner Institute:
Bruker Optik GmbH, Ettlingen, Germany;
University of Hohenheim, Institute of Plant Production and Agroecology in the Tropics and Subtropics, Prof. Dr. Georg Cadisch, Stuttgart, Germany;

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Collaborating Institutions:
Bruker South Africa Ltd., South Africa;

Region:
East Africa, Southern Africa, West Africa

Country:
Kenya, Mali, Mozambique

Thematic Priority:
Integrated land, water and forest management at landscape level

Major Research Domain:
soil management, soil analysis, infrared spectrocospy

Budget:
140,000 €

Goal:
To increase smallholder agricultural production in sub-Saharan Africa while protecting the environment through evidence-based targeting of improved soil management recommendations by agricultural research and development organizations and the private sector

Purpose:
National agricultural research organizations and private sector advisory services in sub-Saharan Africa adopt soil infrared spectroscopy to help target soil management and fertilizer recommendations

Outputs:
- Generalizable indicators of soil fertility capability and soil constraints to crop production in sub-Saharan Africa based on rapid infrared spectral analysis of soils.
- Demonstration of use of soil fertility indicators based on infrared spectroscopy for targeting soil management recommendations in three pilot countries (Kenya, Mali, Mozambique).
- Improved data on prevalence of key soil fertility constraints in the three pilot countries.
- Capacity building of national agricultural research institutes in the three pilot countries and

awareness creation among public and private advisory services in ten sub-Saharan African countries.

Major Results Achieved:
A system based on the use the free software “R” was implemented for spectral pre-treatment and data analysis independent of manufacturer software. Project staff wrote procedures to read binary spectral files and deal with differences in wave number positions. Scripts and procedures for cluster analysis, partial least-squares regression, boosted regression trees, wavelet decomposition and Kennard-Stone algorithm for sample selection are currently developed and tested. Two user-friendly manuals for the near- and mid-infrared spectrometer were written and made available to support a standardized collaboration of the African infrared laboratories. At the same time, these manuals are part for the upcoming ICRAF laboratory ISO certification. The infrared laboratory staff in Nairobi implemented the procedures and was trained to train the staff of the other laboratories in the African network.

Comment:
Output one was adapted after testing the use of a single soil fertility indicator derived from the spectral information. Established predictions of single soil properties can be combined together with common knowledge of soil constraint limits to estimate the soil fertility status of a given sample and subsequently define soil fertility constraint classes or syndromes. These advances will permit outputs two and three to be achieved by providing demonstrations of use of spectral data for making management recommendations based on the ICRAF library data.

Publications:
- “Multi Purpose Analyzer (MPA) Manual”
- “TENSOR 27 Manual”
- Terhoeven-Urselmans, T., Vagen, T.G., Spaargaren,O. and Shepherd, K. 208. Global soil spectral library: a spectrally driven approach for assessing soil quality using infrared spectra. In: Tielkes, E. (Hsg.). Competition for resources in a changing world: new drive for rural development. Tropentag 2008, book of abstracts, October 7-9, University of Hohenheim, Stuttgart, Germany, 490.
- Terhoeven-Urselmans,T., Vagen,T.G., Spaargaren,O. and Shepherd,K. 2009. Global soil infrared spectral library implemented in R. Soil Science Society of America Journal, about to be submitted.

Project Title:
Development of carbon market and conservation financing mechanisms for multifunctional landscape bio-corridors in the Upper Mekong

Project Coordinator:
Professor Xu Jianchu ICRAF,

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Partner Institute:
Goettingen University (Centre for Tropical and Subtropical Agriculture and Forestry)
Professor Christoph Kleinn, Forest Inventory and Remote Sensing; Rainer Brumme , Soil Science of Tropical Ecosystems

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Collaborating Institutions:
Chiang Mai University
b) Dr Steve Eliott, Forest-Biodiversity Restoration Research, Chiang Mai University
c) Dr Dietrich Schmidt-Vogt, Professor of Natural Resources, Asian Institute of Technology
Laos, National Agriculture and Forestry Research Institute (NAFRI):
a) Mr. Khamphay Manivongh
b) Dr. Horst Weyerhaeuser, Research Coordinator, Vientiane, Laos
China
Xishuangbanna Tropical Botanic Garden (XTBG-CAS)
a) Professor Chen Jin, Director, plant ecology
b) Dr Zhu Hua
c) Dr Chuck Cannon
d) Dr Ferry Slik
e) Dr Hu Huabin
Kunming Institute of Botany (KIB-CAS)
a) Professor Yang Yongping, Ethnobotanist and Deputy Director
b) Dr Jiahui Chen, plant taxonomist
c) Ms Yun Wang, botany
ICRAF-China
a) Jianchu Xu, ecologist and coordinator
d) Dr. Timm Tennigkeit CIM Expert on carbon finance
e) Dr Andreas Wilkes, CIM Expert on climate adaptation and payment for ecosystem services
f) Professor Zhang Peifang, Remote Sensing
g) Mrs Huafang Chen, GIS technician
h) Ms Haiying Yu, PhD candidate on GIS and remote sensing
i) Mr Jun He, social scientist
j) Mrs Qing Liu, socio-economist
Myanmar, Department of Forestry

Region:
ASIA

Country:
Laos, Myanmar, Thailand

Thematic Priority:
Integrated land, water and forest management at landscape level
Rural institutions and their governance

Major Research Domain:
multi-funcional landscapes, sustainable land use, biodiversity

Budget:
1,198,000 €

Goal:
To support enhanced and connected multifunctional landscape corridors with both positive livelihood and environmental benefits, managed by smallholder farmers through integrated management and financial mechanisms; and hence contribute to sustainable land-use policies and practices

Purpose:
To identify and develop landscape corridors, stepping stones, and framework species within secondary vegetation and agricultural landscapes in the region. The proposed project seeks to build regional, national, and local capacities for improving livelihoods and landscapes with integrated conservation and development mechanisms.

Outputs:
a) the multifunctional landscape corridors with stepping stones and framework species identified; b) land-use dynamics for each stepping stone assessed; c) biodiversity and carbon assets assessed; d) opportunities for carbon financing and biodiversity offset determined; e) capacity of national partners and key stakeholders enhanced.

Major Results Achieved:
not yet available

Publications:
None so far

Project Title:
Food security and poverty alleviation through improved valuation and governance of river fisheries in Africa

Project Coordinator:
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Collaborating Institutions:
Nigerian Institute for Freshwater Fisheries Research
Department of Fisheries, Ministry of Agriculture, Animal Production, Livestock and Fisheries, Cameroon
Department of Fisheries, Niger; Department of Fisheries, Malawi
Economist University of Malawi; Department of Fisheries, Zambia
Resource Economist University of Cape Town, South Africa
Policy Analyst Institute for Sustainable Development and Aquatic Resources, United Kingdom

Region:
Central Africa, Southern Africa, West Africa

Country:
Cameroon, Chad, Malawi, Niger, Nigeria, Zambia

Thematic Priority:

Major Research Domain:
inland fisheries, policy advice, fishery policies, economic valuation

Budget:
799,820 €

Goal:
To sustain and improve the livelihoods of the rural poor who depend on inland fisheries for their employment, income and food security along the rivers and fringing floodplains of the Lake Chad and Zambesi Basins

Purpose:
To strengthen the capacity of national and regional decision-making to develop and implement governance and policies mechanisms that support river fisheries and enhance their contribution to poverty alleviation and national food security

Outputs:
- An in-depth review of governance arrangements for river fisheries in the Lake Chad and Zambezi Basins
- A review of the current fisheries policy processes at national and regeional levels in the Lake Chad and Zambezi basins
- An ex-ante assessment of the impact of improved governance and valuation information on fisher livelihoods in these 2 river basins
- A comprehensive valuation exercise of the contribution of river fisheries to rural and urban livelihoods in each basin
- A set of robust valuation methods for developing countries river fisheries
- A technical Guide on Economic Valuation of River Fisheries in Developing Countries for policy-makers and planners
- The development and strengthening of professional networks between the NARS partners within and between the two basins
- Up to 16 African professionals trained in economic valuation techniques and governance and policy processes analysis
- at least 3 articles submitted to international peer-reviewed journals

Comment:
A 6-month no-cost extension of the project was granted in February 2008 to complete the data analysis and produce high quality scientific outputs.

Major Results Achieved:
Project Phase 2 has been implemented to transform the knowledge generated on Governance analysis and Policy analysis during Phase 1 into scientific outputs. The conclusions of the governance analysis were summarised as a chapter to appear in 2009 in the book: Fish Trade and Development", published by the Royal Swedish Academy of Agriculture and Forestry. A more comprehensive analysis was submitted to the international Journal World Development. The main conclusions of the Policy analysis are being summarised into three working papers which focus on:
• Investigating the Policy Process for Natural Resource Exploitation in Africa – a comparison of inland fisheries in the Lake Chad and Zambesi Basins;
• Valuing the Importance of Regional Trade for Development in Africa: an empirical case-study of fish trade in the Lake Chad Basin and central Africa;
• Policy approaches and development narratives for fisheries management in Africa – a review of past experiences and lessons learned.
Fieldwork was completed in all partner countries with the assistance of the NARS and data were cleaned and entered for analysis. In total, collections of panel data of 261 households in Nigeria, 285 households in Cameroon, 112 households in Malawi, and 70 households in Zambia was completed with the assistance of the NARS.

Comment:
A 6-month no-cost extension of the project was granted in February 2008 to complete the data analysis and produce high quality scientific outputs."|"- Béné C. "Governance and decentralisation reforms in small-scale fisheries: an African perspective" to appear in 2009 in Fish Trade and Development", published by the Royal Swedish Academy of Agriculture and Forestry.
- Béné C., Belal E., Baba M.O., Malasha I., Njaya F., Ovie S., Raji A., Na Andi M, "Governance and decentralization in small-scale fisheries: an African perspective." Paper presented at the Bi-Annual Conference of the International Institute of Fisheries Economic and Trade (IIFET) in Nha Trang Vietnam (22-25 Jul 2008).
- Béné C., Belal E., Baba M.O., Ovie S., Raji A., Malasha I., Njaya F., Na Andi M., Russell A., and Neiland A. "Power competition, conflicts and alliances at local level: analysing 'democratic' decentralization of natural resources through the lenses of Africa inland fisheries." World Development (submitted Sept 2008)
- Chiwaula, L.S. and H. Waibel (2008): "Risks, shocks and their impact in small scale fishing communities of Hadejia-Nguru Wetlands in Nigeria". presented at the 6th European Development Research Network (EUDN) PhD Seminar at University of Goettingen,

Germany, 17-18 October 2008
- Njaya F., Donda, S. Béné C. “Power contestation and alliances: analysis of local actors’ strategies to capture co-management reforms in Malawi”. Paper presented at the Bi-Annual Conference of the International Institute of Fisheries Economic and Trade (IIFET) in Nha Trang Vietnam (22-25 Jul 2008).
- Witt R., Chiwaula L. and Waibel H. “Vulnerability and household livelihoods in small scale fishing areas in Africa: An asset-based approach” submitted for presentation at the International Conference of Agricultural Economists, Beijing August 2009.
- Witt, R., Pemsl D.E. and Waibel H. “Small-scale inland fisheries in Africa: How to collect data for poverty assessment?” Paper presented at the Annual Conference of Verein für Socialpolitik, Research Committee Development Economics, May 30-31, 2008 Zurich, Switzerland.

Publications:
Strengthening institutions and improving policy development

Project Title:
Climate change impact assessment and adaptation options in vulnerable agro-landscapes in East Africa (CLIMATE CHANGE)

Project Coordinator:
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Partner Institute:
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Collaborating Institutions:
World Agroforestry Center - ICRAF, Kenya;
United Republic of Tanzania

Region:
East Africa

Country:
Tanzania

Thematic Priority:
Not available

Major Research Domain:
Adaptation strategies, agro landscapes, adaptive capacity, climate variability, sustainable livelihoods

Budget:
1,200,000 €

Goal:
To improve the livelihood of smallholders through a range of CCGP's aiming at regional food security, poverty alleviation and sound natural resource management

Purpose:
National and local resource managers use cost-effective and replicable tools and approaches to appraise the likely impacts of climate change, improve the adaptive capacity of their farm systems, and increase the resilience of the agrolandscapes they live in

Outputs:
- Regional downscaled climate change scenarios for different emission scenarios
- Model based estimations of climate change impacts on current land use systems and practices
- Scenarios of sustainable livelihoods and resilient agrolandscapes under climate change
- Assessment of adaptive responses and practices and criteria for best adaption practices

Major Results Achieved:
The project kick-off meeting took place in Tanzania in May 2008. As a case study region the administrative region Morogoro and the watershed Wami-Ruvu was chosen. Local research institutions intending to collaborate with ReACCT were selected. A data survey explored the availability of meteorological data in terms of their type, quality, and spatial and temporal resolution. The regional climate model CCLM was applied to perform a couple of climate simulations for Tanzania. In order to validate and adjust CCLM for the region of interest, a prioritized list of required reference data was prepared including the necessary meteorological parameters, their spatial and temporal resolution. The regional climate model CCLM was implemented and tested with a configuration which completely covers the African continent. A number of state of the art hydrologic water balance models were evaluated. A range of crop growth models have been reviewed and a short list proposed based on suitability and familiarity to local partners in the study region of Morogoro. Socio-economic work focused on the development of approaches and concepts in ReACCT.

Publications:
- Tscherning K, Sieber S, Wenkel K, Kersebaum K, Manful D, Dietrich O, Gomani Ch, Lischeid G, M, Ojoyi M, Baur H, Dietz J, Kitalyi A, Kindt R, Gerstengarbe F.W, Böhm U & Büchner M (2008) Climate Change Impact Assessment and Adaptation Options in Vulnerable Agro-Landscapes in East-Africa,
- Poster presented at the Tropentag 2008, International Conference on Research for Development in Agriculture and Forestry, Food and Natural Resource Management Competition for Resources in a Changing World: New Drive for Rural Development, University of Hohenheim October 7 - 9, 2008, in Stuttgart-Hohenheim (Germany)

Project Title:
Strategies to use Biofuel Value Chain Potential in Sub-Saharan Africa to respond to Global Change - Enhancing low-productivity Farming in Tanzania and linking to SMEs (CLIMATE CHANGE)

Project Coordinator:
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Partner Institute:
IFPRI, ICRAF, Wuppertal Institute for Climate Environment and Energy (WI), Institute for Environmental Economics and World Trade (IUW) - Leibniz University of Hanover, Association for Strenghthening Agricultural Research in Eastern and Central Africa (ASARECA)

Partner Institute email:
Not available

Collaborating Institutions:
Not available

Region:
Sub-Saharan Africa (SSA)

Country:
Tanzania

Thematic Priority:
Not available

Major Research Domain:
Capacity Building, Strategies to use Biofuel Value Chain Potential, Global Change, Enhancing low-productivity farming, benefits to SMEs

Budget:
1,100,000 €

Goal:
Identify the potential for linking low-productivity farming to small and medium enterprises (SME) to enhance livelihoods through biofuel value chains in the scope of increased global energy demand.

Purpose:
To provide farmers, regional organizations and local authorities in sub-Saharan Africa with feasible strategies to benefit from biomass production potential and mitigate food insecurity.

Outputs:
Not available

Major Results Achieved:
not yet available (new project)

Project Title:
What futures for fisheries production systems in West Africa? Development of scenarios for adaptation to climate change

Project Coordinator:
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Partner Institute:
The WorldFish Center – Malaysia Office

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Collaborating Institutions:
Not available

Region:
West Africa

Country:
Ghana, Mauritania, Senegal

Thematic Priority:
Not available

Major Research Domain:
Climate change, fisheries, food security and poverty alleviation, social and economic issues within fisheries supply chains, innovative adaptation strategies

Budget:
60,000 €

Goal:
1. Identify the key features of fisheries productions systems in West Africa as well as drivers of change with a focus on Senegal, Mauritania and Ghana
2.Identify the impact of climate variability and change on these systems
3. Identify how fisheries productions systems are likely to respond to future changes under different climate change, population change, trade patterns, economic and policy scenarios.
4. Provide decision support system tools for national and regional decision makers; explore alternative adaptation strategies, foster knowledge-sharing and dialogue across countries and between science and policy.

Purpose:
The ZMT is interested in gaining knowledge on the impact of climate change on fisheries production systems and on the impact of climate variability on Large Marine Ecosystems. It will profit from its experiences in governance and regional development research as well as climate change.
The WFC seeks to achieve a better understanding of how climate change, taking into account alternative development paths and governance systems, will affect fisheries production systems in order to assist decision-makers in devising policy strategies and

adaptation planning. Project activities will build on current research conducted by the WFC on changes in trade patterns and demand and supply, and on the resilience of fisherfolk livelihoods in West Africa. The project will also be linked to other scenarios initiatives at the regional and the global scale.

Outputs:
The primary output will be scenarios for Mauritania, Senegal and Ghana fisheries production systems to inform policies and identify innovative adaptation strategies. The project results will be used to increase awareness regarding the opportunities and negative impacts that climate change brings, promoting planned adaptation at the national and regional level, thus reducing vulnerability to climate change. Secondary outputs arising from the project include:
1. Bibliographic database and a literature review of the impacts of climate variability and change on fisheries and dependent-livelihoods in West Africa
2. Scenarios for the management of potential future fisheries production system taking into account climate change and other identified key drivers at the regional and country level
3. Set of innovative adaptation strategies identified
4. At least one peer-reviewed publication, one project report and one policy brief

Major Results Achieved:
not yet available (new project)

Publications:
Not available