

World Agroforestry Centre

# **Medium-Term Plan**

## **2008 – 2010**

Transforming Lives and Landscapes through  
Agroforestry Science

*June 15, 2007*

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# Table of Contents

Abbreviations.....	i
<b>MTP Overview .....</b>	<b>1</b>
1. Introduction, Context and Programme Discussion .....	1
2. Implementation of EPMR Recommendations .....	3
3. Highlights of the 2008 Project Portfolio .....	11
5. Financial Indicators .....	15
<b>MTP Narratives.....</b>	<b>16</b>
Global Project 1: Multiscale Assessment of Agroforestry Impacts .....	16
Global Project 2: Tree Genetic Resources and Domestication .....	20
Global Project 3: Tree-based Diversification and Intensification of Smallholder Agriculture .....	26
Global Project 4: Tree Product Markets .....	29
Global Project 5: Agroforestry in multifunctional landscapes: Tradeoffs and Synergies .....	34
Global Project 6: Agroforestry for Land Rehabilitation .....	38
Global Project 7: Agroforestry Systems for Climate Change Adaptation and Mitigation .....	42
Global Project 8: Policy Options and Incentive Mechanisms for Strengthening Agroforestry .....	46
Global Project 9: Strengthening Agroforestry Institutions and Learning .....	42
Global Project 10: African Highland Initiative .....	54
Global Project 11: ASB Partnership for the Tropical Forest Margins .....	58
<b>MTP LogFrames.....</b>	<b>61</b>
GP1 LogFrame - Multiscale Assessment of Agroforestry Practices and Impacts .....	62
GP2 LogFrame - Tree Genetic Resources and Domestication .....	64
GP3 LogFrame - Tree-based Diversification and Intensification of Smallholder Agriculture.....	67
GP4 LogFrame - Tree Product Markets .....	68
GP5 LogFrame - Agroforestry in multifunctional landscapes: tradeoffs and synergies .....	70
GP6 LogFrame - Agroforestry for Land Rehabilitation.....	71
GP7 LogFrame - Agroforestry for Climate Change Adaptation and Mitigation.....	72
GP8 Logframe - Policy options and incentive mechanisms for strengthening agroforestry .....	74
GP9 LogFrame - Strengthening Agroforestry Institutions and Learning tools for Linking Knowledge to Action .....	75
GP10 LogFrame - African Highlands Initiative.....	77
GP11 LogFrame - ASB Partnership for the Tropical Forest Margins.....	79



# **List of Financial Tables**

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Table 1: Allocation of Project Costs by CGIAR System Priority Area and Priorities in 2008 in millions of US \$.....	82
Table 2: Cost Allocation of Resources by CGIAR System Priority from 2006 – 2010 in millions of US \$.....	82
Table 3: Project Cost Summary from 2006-2010 in millions of US \$.....	83
Table 4: Allocation of Project Costs to CGIAR Priorities from 2006 to 2010 in millions of US \$.....	83
Table 5: Investments by Undertaking, Activity and Sector from 2006 to 2010 in millions of US \$.....	85
Table 6: Project Investments by Developing Region from 2006 to 2010 in millions of US \$.....	86
Table 7: Summary of Investments by Developing Region from 2006 to 2010 in millions of US \$.....	87
Table 8: Expenditure by Object from 2006 to 2010 in millions of US \$.....	87
Table 9: Member and Non-Member Unrestricted and Restricted Grants in millions of US \$.....	88
Table 10: Allocation of Member Grants and Centre Income to Projects from 2006 to 2010 in millions of US \$ ...	90
Table 11: Internationally and Nationally Recruited Staff from 2006 to 2010 in millions of US \$.....	98
Table 12: Currency Structure of Expenditure from 2006 to 2008 in millions of units and percent.....	98
Table 13: Statement of Financial Position (SFP), 2006-2008 .....	98
Table 14: Statement of Activities (SOA), 2006-2008 in \$ millions.....	99



# Abbreviations

AAMPS	Association for African Medicinal Plants Standards
ACIAR	Australian Centre for International Agricultural Research
ADG	Assistant Director General
AEZ	Agroecological zones
AF	Agroforestry
AGM	Annual General Meeting
AHI	African Highlands Initiative
AI	Amazon Initiative
AIDS	Acquired Immuno Deficiency Syndrome
APAARI	Asia Pacific Association of Agricultural Research Institutions
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
ASB	Alternatives to Slash-and-Burn (Partnerships for the Tropical Forest Margins)
ASNAPP	Agribusiness in Sustainable Natural African Plant Products
AFTP	Agroforestry Tree Products
BOT	Board of Trustees
CAADP	Comprehensive African Agricultural Development Programme
CAFNET	Coffee Agroforestry Network
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza
CAPRI	Collective Action and Property Rights
CBO	Community Based Organization
CDM	Clean Development Mechanism
CCER	Centre Commissioned External Review
CGIAR	Consultative Group on International Agricultural Research
CIAT	International Centre for Tropical Agriculture
CIDA	Canadian International Development Agency
CIFOR	Centre for International Forestry Research
CIMMYT	International Maize and Wheat Improvement Centre
CIP	International Potato Centre
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement
CORAF/WECARD	West and Central African Council for Agricultural Research and Development
CP	Challenge Programme
CPWILD	Commercial Products from the Wild
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DFID	Department for International Development
DG	Director General

ECAPAPA	East and Central African Programme for Agricultural Policy Analysis
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuária
EPMR	External Programme and Management Review
ES	Environmental Services
ETFRN	European Tropical Forest Research Network
FANRPAN	Food, Agriculture and Natural resources Policy Analysis Network
FAO	Food and Agricultural Organization
FARA	Forum for Agricultural Research in Africa
FASID	Foundation for Advanced Studies on International Development
FORNESSA	Forestry Research Network for sub-Saharan Africa
FORRI	Forestry Resources Research Institute
GDP	Gross Domestic Product
GPs	Global Projects
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation)
HIV	Human Immunodeficiency Virus
HR	Human Resources
ICIPE	International Centre of Insect Physiology and Ecology
ICRAF	International Centre for Research in Agroforestry (World Agroforestry Centre)
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
ER	Institut d'économie Rurale du Mali
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IPCC	Inter-Governmental Panel on Climate Change
IISD	International Institute for Sustainable Development
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute
INERA	Institut de l'Environnement et Recherches Agricoles
INRAN	Institut National de Recherches Agronomiques du Niger
IPG	International Public Good
IRAD	Institutional Research and Application Development
IRD	Institut de recherche pour le développement
IRRI	International Rice Research Institute
ISAR	Institut des Sciences Agronomiques du Rwanda
ISRIC	International Soil Reference Information Centre
IT	Information Technology
ITTO	International Tropical Timber Organization
IUCN	World Conservation Union
IWMI	International Water Management Institute
KARI	Kenya Agricultural Research Institute
KEFRI	Kenya Forestry Research Institute
LAC	Latin American Countries
LADA	Land Degradation Assessment in Drylands

LP	Land and People
LULUCF	Land Use, Land-Use Change and Forestry
MDG	Millennium Development Goals
MRV	Millennium Research Villages
MTP	Medium Term Plan
NARO	National Agricultural Research Organisation
NARS	National Agricultural Research Systems
NASA	National Aeronautics and Space Administration
NEPAD	The New Partnership for Africa's Development
NGARA	The Network for Natural Gums and Resins in Africa
NGO	Non Governmental Organizations
NRM	Natural Resource Management
R&D	Research and Development
RAEZ	Regional Agro Ecological Zone
REDD	Reduced Emissions from Deforestation and Degradation
RELMA	Regional Land Management (SIDA)
RUPES	Rewarding Upland Poor for Environmental Services
SAC	Strategic Alignment Committee
SADC	Southern African Development Cooperation
SAFRUIT	Sahelian Fruit Trees
SCAP	Smallholder Conservation Agriculture Promotion
SI	Strengthening Institutions
SIDA	Swedish International Development Agency
SLT	Senior Leadership Team
SPIA	Standing Panel on Impact Assessment (CGIAR)
SPs	CGIAR System Priorities
SSA	Sub-Saharan Africa
STCP	Sustainable Tree Crops Programme
SWEP	Systemwide and Ecoregional Programmes
PGR	Plant Genetic Resources
THETA	Traditional Health for the Treatment of AIDS
TM	Trees and Markets
TOFNET	Trees on Farm Network
TSBF	Tropical Soil Biology and Fertility Institute
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
USA	United States of America
USAID	United States Agency for International Development
WWF	Worldwide Fund for Nature





# MTP Overview

## 1. Introduction, Context and Programme Discussion

The year 2006 was an important milestone for the World Agroforestry Centre. The Centre achieved over 80 percent of the output targets in the just-ended Medium Term Plan (MTP - 2007-2009). In addition, impact assessments in the areas of integrated natural resource management, fertilizer trees and fodder shrubs demonstrated strong evidence of transformations in agroforestry land use and policy. At the same time, research on carbon sequestration, ecosystem services and land degradation gained momentum as major new grants were secured.

Following the 3<sup>rd</sup> External Programme and Management Review (EPMR) during the year, the World Agroforestry Centre's management started a strategic major realignment of its organizational structure and research programmes that are reflected in the current MTP.

Key developments influencing this MTP are: (a) a new 10-year strategic plan (2008-2017) with refinements in the Centre's mission and institutional goals; and (b) reorganization of programmes from themes to 'Global Projects'.

The changes will most likely continue through 2008 as the Centre aligns current research with emerging science priorities in accordance with the new Strategic Plan.

### **a. Development of a new Strategic Plan**

In its final report of 2006, the 3<sup>rd</sup> EPMR Panel fully endorsed the World Agroforestry Centre's Vision and commended the approach taken to establish a foundation for strategic planning at the Centre. The Panel, however, challenged the Centre to develop a full strategic plan. The report recommended that the Centre "...consolidate its strategic research priorities into a long-term workable strategic plan that directs more effort towards a small number of relevant emerging research topics".

As a first step toward addressing this recommendation, the Strategic Leadership Team (SLT) endorsed the creation of a new Strategic Alignment Committee (SAC). The role of SAC is to provide overall direction and leadership in the planning process that should ultimately involve all staff in the organization.

SAC organized two externally facilitated workshops in

September 2006 and March 2007 to develop the process for consolidating strategic research priorities. In addition to a refreshed mission statement, the workshops achieved the following:

- i) clarification of World Agroforestry Centre's role, niche and strategic advantage;
- ii) definition of strategic priorities for linking agroforestry research-for-development to global poverty, hunger and environmental challenges;
- iii) clarification of major research thrusts and outcomes associated with the strategic priorities; and
- iv) a mechanism for ensuring an integrated approach to generating knowledge and innovations at multiple scales, from local to global.

To support our vision of an Agroforestry Transformation, the World Agroforestry Centre formulated the following mission statement that embodies our overall direction:

***We use science to generate knowledge about the complex role of trees in agricultural systems and their effects on livelihood and the environment, and foster use of the knowledge to influence decisions and practices that impact the poor.***

The vision and mission rests on the assumption that the world will soon be keen to adopt agroforestry as a means to create a multifunctional agriculture that addresses its greatest challenges on a holistic, integrated basis. This will increasingly demand knowledge, policy options, capacity, and institutional networks for linking knowledge to action. The *World Agroforestry Centre's overall goal therefore is to become the partner of choice for a wide range of scientific and development institutions in generating solutions to global problems of rural poverty, hunger, and environmental degradation.* This goal is addressed through the following four institutional objectives:

- **Generate knowledge** by engaging in strategic research in the context of a few key complex global problems, and generate global public goods on agroforestry that have the greatest potential for improving the well-being of poor farmers and protecting the environment;
- **Development-support** by strengthen our role in linking agroforestry knowledge to action, and supporting development institutions facilitating uptake and scaling up of innovations derived from our research;

- **Influence Policy** by engaging in key global and regional policy fora where mainstreaming

The Centre engages with users of knowledge throughout the research and development cycle, and aspires to provide knowledge products in forms that decision makers — from farmers to global policy leaders — need. The Centre aims to adopt management standards and incentives which support work within an effective ‘Knowledge-to-Action’ framework that enrich those used by traditional research organizations.

### ***b. The World Agroforestry Centre’s Research: From ‘Themes’ to ‘Global Projects’***

Through the strategic planning process, the World Agroforestry Centre identified three key priorities to frame its research-for-development agenda. These three strategic priorities are defined around the major entry points for agroforestry in addressing challenges in agriculture and natural resource management. The priorities now form the basis for defining the Centre’s Global Projects (GPs) and are linked to the Millennium Development Goals (MDGs). These priorities are:

- **Agroforestry for livelihoods:** Research to address livelihood impacts of agroforestry innovations, smallholder-farm household constraints with access to quality tree germplasm, integration and management of trees on-farm, and market value chains for tree products (*linked to MDG1 and MDG6*).
- **Agroforestry and environment:** Research to address tradeoffs in degradation avoidance and land rehabilitation, foster adaptation to climate change, enhance the role of agroforests in maintaining ecosystem services, and negotiation support systems (*linked to MDG7*).
- **Agroforestry and institutions:** Research to address the apparent disconnect between local knowledge, policy and science, differences in knowledge and level of information, link multiple ways of learning, insufficiency of approaches and methods to handle the management and integration of knowledge, and the disconnect between agriculture and forestry institutions (*linked to MDG2 and MDG8*).

Based on this framework, the World Agroforestry Centre has reorganized its research into nine Global Projects. In addition to grounding the science of agroforestry, the GPs are defined to facilitate learning and synthesis as well as generation of global public goods. We recognize that some degree of consolidation and refocusing of the projects will be necessary, but together they form the basis for the 10-year Strategic Plan that will be updated as our learning is enriched.

A detailed description of the Global Projects and outputs, including their alignment with

CGIAR System Priorities, is presented in the **MTP Narrative** section (see Table A for a summary). Table B presents mapping of the 2006 MTP Focal Area Outputs and budget allocations to the Global Projects. Overall, the World Agroforestry Centre’s research for development agenda is now strongly aligned with the System Priorities, including major contributions to sub-priorities **2D, 3A, 3D, 4A, 4D,** and **5D**.

In addition to the Global Projects, the Centre will also maintain its hosting and substantive involvement in two system-wide and eco-regional programmes: the African Highlands Initiative (AHI) and the ASB Partnership for Tropical Forest Margins. These are also described in this MTP.

### ***c. Development-support, policy engagement and networking***

As noted earlier in this section, the World Agroforestry Centre also considers development support, science-policy linkages and institutional networking as crucial elements of its mission. These institutional objectives foster the use of agroforestry knowledge to influence decisions that impact the poor. Over the years, the Centre has engaged in activities to support development institutions facilitating uptake and scaling-up of innovations derived from its research. Several major donor-funded projects have served as major learning and innovation platforms for linking knowledge to action. These projects include the recently ended Regional Land Management (RELMA) initiative that was supported by the Swedish International Development Agency (SIDA) in Eastern Africa and the Zambezi Basin Agroforestry programme in Southern Africa, funded by the Canadian International Development Agency (CIDA).

Participating in global and regional policy fora is key to ensuring that agroforestry knowledge is mainstreamed into decisions and practices that impact the poor. For example, agroforestry is being increasingly recognized as a productive land use that contributes directly and synergistically to objectives of international conventions. The World Agroforestry Centre contributes methods, tools and practices to foster use of agroforestry in implementing the conventions.

Similarly, the Centre connects its work to regional and national policy fora through engagement with relevant government agencies and ministries. As a result, agricultural development, economic growth, poverty reduction, and environmental policies are major targets for mainstreaming agroforestry at the national level.

Finally, the World Agroforestry Centre’s capacity to be a boundary spanning organization for agroforestry depends heavily on networking with and strengthening the capacity of institutions. The development of

agroforestry education networks in Africa (ANAFE) and Southeast Asia (SEANAFE) with support from SIDA has played an important role in leveraging pedagogical transformations in universities. Innovations in curricula and teaching methods are helping to produce students who are better prepared to engage in integrative research.

Through initiatives such as the SII Project funded by the Netherlands Government, the Centre is helping to produce training materials and mainstream their use for improving integrated natural resource management research by national agricultural research systems (NARS). The SII project aims to strengthen regional and national research as well as development and learning institutions in developing countries through a series of short, specialist training events and the development of appropriate learning resources.

## **2. Implementation of EPMR Recommendations**

The World Agroforestry Centre has made rapid and significant progress in implementing recommendations of the 3<sup>rd</sup> EPMR (see Table C). Since mid-2006, substantive changes have been made in various areas, including the science agenda and organizational framework for implementation articulated in the new Strategic Plan. Other important structural and operational changes are ongoing. Most of these changes are set to be completed by December 2007. A mini-review of Recommendations 1 and 2 is currently underway. All these changes are calculated to bring long-term benefits and reinforce the Centre's role as a global science organization.

**Table A – Global Projects and alignment with CGIAR System Priorities**

Global Projects	Alignment with the CGIAR System Priorities (primary links only)
1. Multiscale Assessment of Agroforestry Impacts - <i>ex ante and ex post impact assessments; scaling-up methods</i>	3D (Sustainable income from forests and trees) 5D (Improving R&D options to reduce rural poverty and vulnerability)
2. Tree Genetic Resources and Domestication - <i>characterization, conservation and improvement of tree germplasm; domestication principles and practices</i>	1B (Conservation/characterisation of under-utilized Plant Genetic Resources) 2D (Genetic enhancement of selected species to increase incomes) 3A (Increasing incomes from fruits and vegetables)
3. Tree-based Diversification and Intensification of Smallholder Agriculture - <i>principles, tools, and approaches for integration of trees on-farm</i>	3D (Sustainable income from forests and trees) 4C (Improving water productivity) 4D (Sustainable agro-ecological intensification in low and high-potential areas)
4. Tree Product Markets - <i>markets as opportunities and drivers of agroforestry land use</i>	3A (Increasing income from fruit and vegetables) 3D (Sustainable income from forests and trees)
5. Agroforestry in multifunctional landscapes: tradeoffs and synergies - <i>landscape scale interactions and functioning of agroecosystems</i>	3D (Sustainable income from forests and trees) 4A (Integrated land water and forest management at landscape level) 4D (Sustainable agro-ecological intensification in low/high potential environments)
6. Agroforestry for Land Rehabilitation - <i>assessments and technological options</i>	4A (Integrated land, water and forest management at landscape level) 4D (Sustainable agro-ecological intensification in low/high potential environments)
7. Agroforestry Systems for Climate Change Adaptation and Mitigation – <i>assessment of impacts and options for income generation and environmental sustainability</i>	3D (Sustainable income from forests and trees) 4A (Integrated land water and forest management at landscape level) 4D (Sustainable agro-ecological intensification in low/high potential environments)
8. Policy Options and Incentive Mechanisms for Strengthening Agroforestry - <i>decision support tools, incentive systems, and options for influencing policy</i>	4A (Integrated land, water and forest management at landscape level)
9. Knowledge and Learning Tools for Agroforestry Innovation - <i>leveraging agroforestry research for development through institutions</i>	5A (Science and technology policies and institutions) 5D (Improving R&D options to reduce rural poverty and vulnerability)

**Table B – Mapping of 2006 MTP Focal Area Outputs and Budgets to the new Global Projects (Primary: ■ Secondary: ■)**

Focal Area Outputs	Old Focal Area Output Title	GP1 Multiscale Assessments	GP2 Genetic Resources	GP3 Tree Management	GP4 AFTP Markets	GP5 Multifunctional Landscapes	GP6 Land Rehabilitation	GP7 Climate Change	GP8 Policy options	GP9 Learning & Institutions
ES1.1	Watershed management					0.758	0.255		0.262	
ES1.2	Biodiversity conservation					0.183				
ES1.3	Trees in multifunctional landscapes					0.113	0.038		0.039	
ES2.1	Climate change mitigation					0.050	0.050	0.155		
ES2.2	Climate change adaptation							0.055		
ES3.1	Harmonising policy for environment and poverty goals					0.507		0.787	1.315	
ES3.2	Rewards for Environmental Services					0.138	0.139		0.431	
ES3.3	Agroforestry in international policy								0.047	
LP1.1	Land degradation and soil fertility			0.295		0.321	0.970	0.332		
LP1.2	Land rehabilitation and enrichment						0.840	0.288		
LP2.1	Smallholder resources, livelihoods and strategies	0.893								0.224
LP2.2	Integrated tree-crop-livestock			0.446						
LP2.3	Improved water productivity			0.089		0.084	0.254			
LP3.1	Institutional innovations							0.399	1.602	
LP3.2	Incentives for smallholder agroforestry	0.490							0.127	
SI-1.1	Agroforestry-NRM science, technology and policies							0.273	0.821	0.264
SI-1.2	Agroforestry research/teaching capacity			0.307						1.162
SI-1.3	Institutionalization of agroforestry, NRM						0.373			1.489
SI-2.1	Characterisation, partnering with development institutions									
SI-2.2	Collaboration and networking								0.207	0.799
TM1.1	Tree genetic resources and information		1.521					0.389		
TM1.2	Seed and seedling systems		1.120							
TM1.3	On-farm management of tree genetic diversity			0.233		0.055				
TM2.1	Participatory evaluation and analysis		0.988							
TM2.2	Tree improvement and management		0.301	0.079						
TM2.3	Improving dissemination and scaling up	1.098								
TM3.1	Market research				1.024					
TM3.2	Tree product development				2.299					
<b>TOTALS</b>		<b>2.482</b>	<b>3.929</b>	<b>1.451</b>	<b>3.323</b>	<b>2.208</b>	<b>2.919</b>	<b>2.678</b>	<b>4.851</b>	<b>3.938</b>

## Table C – Progress on Implementation of EPMR Recommendations

**Name of Centre:** WorldAgroforestry

Dates of EPMR Report Presentation and Discussion:

Science Council: May 10<sup>th</sup> 2006; Cotonou, Benin

Executive Council: May 18<sup>th</sup> 2006; The Hague, Netherlands

CGIAR Annual General Meeting: December 2006, Washington DC, USA

Recommendation as listed in EPMR Report	Accepted	Implementation		Target Date of Completion
		Milestones	Progress Achieved	
<p><b>Recommendation 1</b></p> <p><i>ICRAF consolidate its strategic research priorities into a long-term workable strategic plan that directs more effort towards a small number of relevant emerging research topics. (page 93)</i></p>	Accepted	<ul style="list-style-type: none"> <li>Strategic Alignment Committee (SAC) endorsed by the ICRAF Programmes Committee, including the Senior Leadership Team (SLT), Theme Leaders (TLs), and Regional Coordinators (RCs)</li> <li>Document on SAC operations formally endorsed by SLT</li> <li>Framework for the process to develop strategic research priorities established by SAC</li> <li>Workshop of the Programmes Committee convened at which framework for selecting research priorities is confirmed</li> <li>Framework for selecting research priorities presented to the Board ExCo for review in October 2006.</li> <li>New strategic plan finalized and presented to the Board for discussion and approval at its meeting in April, 2007</li> <li>New strategic plan published and disseminated to all stakeholders(staff, partners, donors) in June, 2007</li> </ul>	<ul style="list-style-type: none"> <li>Decision was made to establish a Strategic Alignment Committee in March, 2006.</li> <li>SAC began its formal meetings, and developed a terms of reference for its work in April 2006 which was approved by the SLT.</li> <li>Documentation of the progress of the SAC was initiated during its first meeting in April 2006.</li> <li>SAC convened a workshop during the Programmes Committee that developed and confirmed the framework for selection of strategic research priorities in September, 2006.</li> <li>A second workshop was held in March 2007 during which the strategic priorities were identified in the form of 9 (nine) Global Projects, including areas of emerging science.</li> <li>Draft Strategic Plan incorporating the priorities was completed and tabled for Board approval at its 44<sup>th</sup> meeting in April 2007.</li> </ul>	December 2007
<p><b>Recommendation 2</b></p> <p><i>An analysis be undertaken of the likely impacts of involvement in large development projects, including the Millennium Villages Project, on ICRAF's overall balance between research and development, staff commitments and administrative costs; it is also important to ensure that projects with restricted funds be aligned with ICRAF's strategic research goals (page 40)</i></p>	Accepted	<ul style="list-style-type: none"> <li>WorldAgroforestry's current involvement in the MRV project was reviewed and analysed at a meeting convened in May 2006</li> <li>Guidelines on embedding science in development projects drafted and agreed upon by the Programmes Committee in September 2006</li> <li>The guidelines on embedding science in projects with development support components used by the strategic alignment committee to review current and new project initiatives by March 2007</li> <li>The Medium Term Plan for 2008-10 to include an analysis of the action taken to deploy the guidelines in decisions on embedding science in projects with development-support components (June 2007)</li> </ul>	<ul style="list-style-type: none"> <li>WorldAgroforestry's current involvement in the MRV project was reviewed and analysed at a meeting convened in May 2006.</li> <li>Guidelines on embedding science in development projects were drafted in May 2006</li> <li>SAC prepared a draft memo to the DG on the status of ICRAF's involvement in the MRV project. DG will convene a meeting of WorldAgroforestry staff associated with the MRV project to discuss and finalize the analysis as a report.</li> <li>Guideline for embedding science in development is being evaluated by staff</li> <li>An additional guideline on the development of new projects is being developed to facilitate linking of funded grants to Global Projects and MTP outputs.</li> </ul>	June 2007

<p><b>Recommendation 3</b> ICRAF merges its south Asia and Southeast Asia programmes into an Asia Region, with liaison units posted in India and China with clearly stated roles. (page 46)</p>	<p>Agreed to study the issue and explore alternatives</p>	<ul style="list-style-type: none"> <li>• Discussion convened with the regional coordinators of South Asia and Southeast Asia to develop a process for analysis of strategic alignment of the regions (March 2006)</li> <li>• The strategic frameworks for the two regions reviewed and mapped against each other to elucidate similarities and differences with regard to impact pathways. (September 2006)</li> <li>• Processes developed to implement joint planning for programmatic and administrative synergies between the regions (by December 2006)</li> <li>• First round of joint planning for inter-regional collaboration on proposals and publications (during 2007)</li> </ul>	<ul style="list-style-type: none"> <li>• The first discussion on regional strategic alignment was convened in March 2006</li> <li>• Strategic frameworks now developed for joint review in September 2006</li> <li>• Comparative analysis of the respective programmes completed in October 2006 in the form of a spreadsheet of topics of current interest to both regions as the basis for inter-regional collaboration.</li> </ul>	<p>December 2007</p>
<p><b>Recommendation 4</b> ICRAF ceases to maintain Latin America as a Region but instead retains a liaison unit there, associated with the Amazon Initiative. (page 48)</p>	<p>Accepted</p>	<ul style="list-style-type: none"> <li>• Analysis on the future of the Centre's work in Latin America discussed with the Board in April 2005.</li> <li>• Three options for the future modality of managing WorldAgroforestry activities in Latin America reviewed in depth at the Board of Trustees meeting in January 2006, including the solution indicated by the Panel. The panel's recommendation concluded to be the favoured option, to be implemented through the process of establishing the business plan of the forthcoming Amazon Initiative Ecoregional Program.</li> <li>• Consultations with AI partners on the issue during 2006.</li> <li>• Terms of Reference of the current reviewed and amended during 2006</li> <li>• Decision on the future modality for managing the regional work of WorldAgroforestry issue to be finalized</li> </ul>	<ul style="list-style-type: none"> <li>• Analysis on the future of the Centre's work in Latin America discussed with the Board in April 2005.</li> <li>• Three options for the future modality of managing WorldAgroforestry activities in Latin America reviewed in depth at the Board of Trustees meeting in January 2006</li> <li>• The RC is jointly employed by CIAT and WorldAgroforestry, and his current employment contract ends June 2007. The TOR for the current Regional Coordinator position will be changed as of July, 2007.</li> </ul>	<p>July 2007</p>
<p><b>Recommendation 5</b> ICRAF maintains its role in ASB. The Panel concurs that the capacity developed in ASB should be sustained and strengthened to maintain a global platform in which ICRAF's innovative research can be validated and implemented (page 55)</p>	<p>Accepted</p>	<ul style="list-style-type: none"> <li>• WorldAgroforestry's emerging science reflected in ASB new strategic direction</li> <li>• WorldAgroforestry's regional engagement in the new ASB strategic direction clarified</li> </ul>	<ul style="list-style-type: none"> <li>• ASB has developed its work plan and budget for 2007, and operates under a new Coordinator.</li> </ul>	<p>December 2007</p>
<p><b>Recommendation 6</b> The CGIAR commission an external review of the AHI Systemwide Program to seek answers to the questions raised by the Panel and make recommendations on the future role of ICRAF in the AHI. (page 57)</p>	<p>Accepted</p>	<ul style="list-style-type: none"> <li>• New coordinator to be appointed for AHI</li> <li>• Thematic priorities for IPGs, modes of operation, and modes of advancing impact clarified by AHI Steering Committee;</li> <li>• External review of AHI commissioned by CGIAR SC;</li> <li>• Integration of AHI research themes and priorities with WorldAgroforestry's Eastern Africa regional programme, and in relation to CGIAR priorities and the Eastern and Southern Africa MTP completed.</li> </ul>	<ul style="list-style-type: none"> <li>• New coordinator recruited end of 2006 and assumed duties in March 2007</li> <li>• AHI Steering Committee discussed and clarified the Initiative's approach to IPGs, modes of operation, and modes of advancing impact by mid-2007.</li> <li>• Integration of AHI research themes and priorities with WorldAgroforestry's Eastern Africa regional programme, and in relation to CGIAR priorities and the Eastern and Southern Africa MTP completed by mid-2007.</li> <li>• The CG's meta-review was completed, including for AHI, with generally favourable comments.</li> <li>• AHI review got underway in April 2007</li> </ul>	<p>December 2007</p>

<p><b>Recommendation 7</b> ICRAF Board and management strictly enforce their “zero-tolerance” approach to staff and service providers who transgress the rules and procedures governing the use of the Centre’s resources, taking prompt, decisive and unambiguous action when malfeasance has been established; the results should be communicated (with appropriate safeguards) to all Centre staff and other parties affected. (page 78)</p>	Accepted	<ul style="list-style-type: none"> <li>The revised Human Resources Manual with the Code of Conduct and Whistle Blowing policies published and enacted in July 2006.</li> <li>All staff have signed a copy of the Code of Conduct which will be placed in their respective files by December 2006.</li> </ul>	<ul style="list-style-type: none"> <li>The revised Human Resources Manual with the Code of Conduct and Whistle Blowing policies were reviewed and approved. The Manual was released to staff (August 2006).</li> </ul>	Action completed and formally institutionalized
<p><b>Recommendation 8</b> Major risk factors be discussed thoroughly at the BoT level and risk management becomes a standing agenda item for each session of the full BoT. (page 78)</p>	Accepted	<ul style="list-style-type: none"> <li>Meeting of the committee in June 2006 to review the progress of the ESBC plan. Teleconference meeting planned with the Chair of the Audit Committee in July 2006.</li> <li>The risk management plan will be reviewed by the Executive Committee of the Board in October 2006</li> <li>Risk management will continue to be a regular agenda item at every Board meeting</li> </ul>	<ul style="list-style-type: none"> <li>The Risk Management Committee met in October 2006 and identified new risks facing the Centre as well as reclassified other risks which had changed in their risk impact &amp; likelihood.</li> <li>These changes were updated into the overall risk profile of the Centre. These analyses and actions are contained in the risk management report sent to the board in March, 2007.</li> <li>Board reviewed the report at its 44<sup>th</sup> Meeting in April 2007</li> </ul>	Action completed and formally institutionalized
<p><b>Recommendation 9</b> A review by the CGIAR audit unit of ICRAF management’s BOT secretariat policies and management’s procedures including, but not limited to, the production and dissemination of documents for all board meetings, to provide a foundation for the most expeditious possible improvement programme (page 80)</p>	Accepted	<p>The CGIAR Audit Unit (AU) has scheduled this assignment and will carry it out in two phases during 2007.</p> <ol style="list-style-type: none"> <li>Terms of Reference to be sent to the Board Chair and the Senior Leadership Team (May)</li> <li>Carry out review (Sept)</li> <li>Draft report and circulate to recipients (October)</li> <li>Issue final report (by end of December)</li> </ol>	<ul style="list-style-type: none"> <li>Draft TOR has been developed, shared with the Board of Trustees Chair and Senior Leadership Team, finalized and approved (July).</li> <li>A final draft report on Board Reporting at ICRAF with management comments has been circulated to the audit committee of the board for their comments.</li> <li>The final report was circulated to the full Board and discussed during its 44<sup>th</sup> meeting in April, 2007.</li> </ul>	December 2007
<p><b>Recommendation 10</b> ICRAF engage the services of an independent, appropriately qualified and experienced management consultant to work with the three most senior levels of management to clarify and strengthen their respective roles and responsibilities, and to establish appropriate managerial processes. (page 82)</p>	Accepted	<ul style="list-style-type: none"> <li>Independent international management consultant engaged to work with SLT (January, 2006)</li> <li>Scope of work of consultant extended to the top three levels of management (March 2006)</li> <li>Second consultant engaged to provide executive coaching (July 2006)</li> <li>Performance Improvement Plan developed (August 2006)</li> <li>Report to the CGIAR ExCo on progress achieved (October, 2006)</li> </ul>	<ul style="list-style-type: none"> <li>Independent international management consultant engaged to work with SLT (January, 2006)</li> <li>Scope of work of consultant extended to the top three levels of management (March 2006)</li> <li>Second consultant engaged to provide executive coaching (July 2006)</li> <li>Performance Improvement Plan developed (August 2006)</li> <li>Reports on progress achieved in all aspects of the plan were submitted to the CGIAR Secretariat in October, 2006, and February, 2007.</li> <li>A new Management Decision Matrix with clear roles and responsibilities was drafted and is currently being finalized</li> </ul>	December 2007

<p><b>Recommendation 11</b> ICRAF urgently recruits a qualified and experienced professional Human Resources manager, whose training and experience cover the entire spectrum of HR services, including staff management, staff development, but also compensation and benefits. (page 63).</p>	<p>Accepted</p>	<ul style="list-style-type: none"> <li>Restructuring plan for the HR Unit completed.</li> <li>Recruitment of a new HR manager completed.</li> <li>Fresh recruitment of all positions in the HR Unit to be initiated upon approval of the new HR restructuring plan.</li> <li>Review and assessment of progress completed in mid-2007</li> </ul>	<ul style="list-style-type: none"> <li>Restructuring plan for the HR Unit drafted in May 2006, and an updated version completed in March 2007</li> <li>Recruitment of a new HR manager was initiated in May 2006 and completed in late 2006. New HR Manager took over in February 2007.</li> </ul>	<p>December 2007</p>
<p><b>Recommendation 12</b> ICRAF appoints a suitably qualified and experienced Chief Operations Officer (at the level of ADG-Operations) with overall responsibility for Financial Services, Human Resources, Operations, a Joint Services Unit to be established with ILRI and all other administrative services. (page 102)</p>	<p>The response to this</p>			
<p><b>Recommendation 13</b> The Office of Strategic Initiatives be repositioned as a unit reporting directly to the DG and assisting the Office of the DG principally in resource mobilization and external relations. (page 101)</p>	<p>Accepted</p>	<ul style="list-style-type: none"> <li>The responsibility for the systemwide programmes (ASB and AHI) transferred to the DDG-P (August 2006)</li> <li>The full range of functions of the DSI clarified in the context of the SLT performance improvement plan (August 2006)</li> <li>The role of the DSI vis-à-vis the DDG-P regarding interactions with the theme leaders and regional coordinators revised and implemented (Sept 2006)</li> </ul>	<ul style="list-style-type: none"> <li>The transfer of responsibilities for the system wide programmes (ASB and AHI) discussed and agreed upon by the Directors and DG (June 2006)</li> <li>The revised role of the DSI vis-à-vis the DDG-P regarding interactions with the theme leaders and regional coordinators discussed and agreed upon by the Directors and DG (June 2006)</li> <li>DSI role clarified, realigned and reassigned as Assistant Director General within the Director General's Office as of 1 January, 2007</li> </ul>	<p>December 2007</p>

<p><b>Recommendation 14</b></p> <p><i>A joint ICRAF-ILRI Corporate Services Unit be established as soon as possible, including IT, Research Support and Communications. (page 58, 59, 66, 69)</i></p>	<p>Accepted</p>	<ul style="list-style-type: none"> <li>Corporate Services staff of ILRI and WorldAgroforestry held a workshop to determine the alignment issues in May 2006.</li> <li>A full proposal on the alignment of corporate and research services completed (July 2006)</li> <li>Proposal submitted to the CG Secretariat for shared financial support (August 2006)</li> <li>Research support services unit jointly implemented (October 2006)</li> <li>Joint operations provider being contracted by both centres</li> <li>Joint WorldAgroforestry/ILRI IT CCER conducted in November 2006 to ascertain working frameworks within the independent IT units with the aim of merging them into a single IT unit across the two centres</li> </ul>	<ul style="list-style-type: none"> <li>Corporate Services staff of ILRI and WorldAgroforestry held a workshop to determine the convergence issues in May 2006.</li> <li>Draft proposal on the alignment of corporate and research services completed in June 2006.</li> <li>Analysis of joint service provider for operations completed in July 2006</li> <li>Proposal for alignment of corporate services between ILRI and ICRAF completed and submitted for co-financing by the CGIAR Secretariat in September 2006</li> <li>Proposal and co-financing approved by the CGIAR Secretariat in October 2007</li> <li>Alignment process fully underway as articulated in the proposal.</li> <li>IT CCER commissioned in November 2006 has been completed and actions are underway to streamline the service</li> </ul>	
<p><b>Recommendation 15</b></p> <p><i>ICRAF moves to the following revised organizational structure and staffs it appropriately. (page 102)</i></p>	<p>Accepted. This response relates to both</p>	<ul style="list-style-type: none"> <li>The revised organizational plan presented and discussed at the Programmes Committee Meeting in September 2006.</li> <li>The plan will be finalized and presented to the Executive Committee of the Board of Trustees at its next meeting in October 2006.</li> </ul>	<ul style="list-style-type: none"> <li>The senior leadership team launched intensive work on the elements of a revised organizational plan at its retreat on June 3, 2006.</li> <li>The revised organizational plan presented and discussed at the Programmes Committee Meeting in September 2006.</li> <li>New organizational realignment plan endorsed by Executive Committee of Board in October 2006 and approved by the full Board in November, 2007.</li> <li>The approved organizational realignment plan fully implemented as of 1 January, 2007</li> </ul>	<p>December 2007</p>

### 3. Highlights of the 2008 Project Portfolio

The 2008-2010 MTP is based on the World Agroforestry Centre's new research-for-development project structure. The nine projects defined in the new Strategic Plan are a combination of current strategic research and emerging science priorities. Since the new strategy extends through 2017, the Centre envisages that the three-year rolling MTP will over time reflect various degrees of emphasis and levels of financial investment among the Global Projects. This will be based on evolving changes in global importance of problems, the Centre's scientific and technical capacity, opportunities for resource mobilization, and many other factors.

By including all nine Global Projects in the current MTP, the Centre is making a commitment to define the ultimate boundaries of its scientific portfolio to ensure research remains strategy and mission-driven. Annual reviews of the MTP will highlight changes in implementation of the GPs relative to projected investment opportunities over the 10-year timeframe. In this document, we summarize key highlights of the 2008 portfolio for each of the nine Global Projects, including links to the previous MTP projects.

#### ***Global Project 1: Multiscale Assessment of Agroforestry Impacts***

This is a relatively new area of strategic research for the World Agroforestry Centre that evolved from the growing recognition of global demand for tree-based practices that enhance multiple functions of landscapes. It includes all of LP2.1 (Analyzing smallholder constraints and opportunities and identification of agroforest interventions) and large parts of LP3.1 (Options for collective action and other incentive mechanisms for smallholders) and TM2.3 (Improving dissemination and scaling up of germplasm, technologies and practices) from the previous MTP. The 2008 portfolio highlights include knowledge of equity and productivity impacts of agroforestry in Eastern and Southern Africa as well as testing of methods for land degradation assessment to understand vulnerability risks of the poor and enhance targeting of agroforestry interventions (cross-linked and integrated with GP6).

#### ***Global Project 2: Tree Genetic Resources and Domestication***

This project is an enhanced and combined formulation of TM1 (Agroforestry Tree Germplasm) and TM2 (Tree Domestication) from the previous MTP. It focuses on addressing two perpetual constraints to leveraging improved livelihoods and generating environmental benefits from agroforestry. These are: (a) the absence of enough quality tree planting

material; and (b) availability of improved planting material for high-value indigenous and exotic trees for on-farm integration by smallholder farmers. Highlights of the 2008 portfolio include species-specific characterization of germplasm, intra-specific assessments of tree diversity, and methodologies and protocols for tree improvement and germplasm dissemination (cross-linked with GP3 and GP4).

#### ***Global Project 3: Tree-based Diversification and Intensification of Smallholder Agriculture***

This project mainly incorporates LP2.2 (Principles and options for management of agroforestry), LP2.3 (Principles and options for integrating agroforestry with water), TM1.3 (On-farm management of tree diversity), and TM2.2 (Tree improvement and management) from the previous MTP. It addresses the role of agroforestry in enhancing the performance of smallholder farming systems. The project includes the following components: increasing productivity of associated crop and livestock systems, generating income through high-value tree products, enhancing nutrient and water use efficiency in tree-based systems, and increasing the resilience of agricultural systems through tree-based practices based on production ecology principles.

Highlights of the 2008 portfolio include a number of cross-regional synthesis of social and economic constraints for adoption and on-farm integration of trees (cross-linked with GP1 and GP5), several extension and training materials for on-farm management of high-value trees, lessons learnt in water harvesting on smallholder farms, and suitability maps of tree species in select smallholder production systems.

#### ***Global Project 4: Tree Product Markets***

Tree cultivation increases margins for farmers, in terms of efficiency and volume, and increases their access to tree product value chains. This project, which is drawn from TM3 (Marketing of Agroforestry Tree Products) in the previous MTP, will focus on value-adding opportunities that enhance incomes of smallholder farmers. While tree-product markets offer a great opportunity for improving livelihoods through income generation, markets can also serve as drivers for land-use change that impacts the environment. The project therefore includes parts of ES2 (Climate Change) and ES3 (Environmental Policy) from the previous MTP to enable smallholder farmers effectively harness markets without adverse effects on the environment. Highlights of the 2008 portfolio include assessment of constraints for tree product markets and services, development of guidelines for facilitating the development of seed and seedling marketing systems, and enhancing the capacity for medicinal tree products.

### ***Global Project 5: Agroforestry in Multifunctional Landscapes: Tradeoffs and Synergies***

This Global Project builds on and refocuses the World Agroforestry Centre's experience with projects ES1.2 (Joint World Agroforestry Centre/CIFOR biodiversity conservation), ES1.1 (Watershed management), and ES1.3 (Trees in multifunctional landscapes) from the previous MTP. In addition, it builds on work of ASB Partnership for Tropical Forest Margins in the areas of tradeoff analysis for agricultural land use and forest conservation, and cross links with GP3 on farm level scale, and GP8 on institutions.

Highlights of the 2008 portfolio include the development of dynamic tradeoff models for 'goods' and 'services' from multifunctional landscapes with trees, validation of models for assessment of landscape-level watershed functions, improvement of methodologies for rapid appraisal of hydrological functions and agrobiodiversity in landscapes, and synthesis of existing knowledge on carbon sequestration potential from agroforestry systems.

### ***Global Project 6: Agroforestry for Land Rehabilitation***

This is an emerging science area for the Centre that aims to provide governments, land resource managers and other stakeholders with the knowledge and decision-support tools for assessing and tackling land degradation through agroforestry. The project derives largely from LP1 (Land and Soil Health) and incorporates LP2.3 (Principles and options for smallholder agroforestry management) in the previous MTP. It also cross-links with GP1 to guide resource allocation, identify rehabilitation strategies and monitor outcomes and impact.

Highlights of the 2008 portfolio include dissemination of a land health surveillance framework for evidence-based diagnosis, testing and targeting of land rehabilitation interventions in sub-Saharan Africa; design concepts for an evidence-based decision support system to target agroforestry options for land rehabilitation; and a meta-analysis of experimental data on agroforestry-based soil rehabilitation in African maize systems.

### ***Global Project 7: Agroforestry Systems for Climate Change Adaptation and Mitigation***

Agroforestry plays important roles in enhancing the resilience of agro-ecosystems through micro-climate moderation, protection of crops against droughts and floods through soil and water conservation, buffering against pests and diseases as well as diversifying the ecological system and farmers' incomes. By identifying the resources on which agroecosystem adaptation can be based, the World Agroforestry

Centre is well positioned to contribute to the maintenance and strengthening of agricultural systems in the face of climate change and to recognize where vulnerability will be highest.

This project is a reformulation of ES2 (Climate Change) in the previous MTP. It focuses on four major lines of research: vulnerability assessment, impact of climate change on agroforestry systems, adaptation to climate change, and synergies in agroforestry systems between climate change adaptation and mitigation.

Highlights of the 2008 portfolio include development of a toolbox for carbon measurement and monitoring in smallholder agroforestry.

### ***Global Project 8: Policy options and incentive mechanisms for strengthening agroforestry***

Policy and institutional constraints affect the performance of smallholder agriculture in many developing countries. This is no less important in the area of agroforestry than other agricultural sectors. The World Agroforestry Centre seeks to influence policy processes by providing targeted advice on how agroforestry can better contribute to the goals of regional environmental plans and the multilateral environmental agreements. This project builds on LP3 (Institutional Innovations and Incentives) and ES3 (Environmental Policy) in the previous MTP.

Highlights of the 2008 portfolio include a synthesis of by-laws for natural resource management in Africa, a scoping study on compensation for ecosystem services in Africa, estimates of emission abatement costs functions for contrasting sites in the tropical forest margins, and policy advice to national and local policy makers on how to facilitate environmental service agreements.

### ***Global Project 9: Strengthening Agroforestry Institutions and Tools for Linking Knowledge to action***

Many countries recognize the importance of agroforestry, but it is clear that few of them have established policies and institutions to handle agroforestry or mainstream it into existing institutions. Similarly, global institutions need to be better informed on the potentials and challenges of agroforestry. This global project is a reformulation of SI1 (Strengthening the capacity for agroforestry and NRM science at national institutions) and SI2 (Enhancing capacity for sharing agroforestry and NRM innovations for scaling up) from the previous MTP. It focuses on understanding the underlying causes of agroforestry capacity inadequacy and the identification of strategic, cost-effective approaches for alleviating capacity constraints.

Highlights of the 2008 portfolio include tools for characterizing agroforestry readiness of research and

development institutions as well as boundary issues, a learning-competency matrix of different stakeholders involved in developing and managing Agroforestry programmes. It also includes analysis of successful cases of organizations that link knowledge to action in integrated natural resource management as basis for good practice guides and learning tools as well as policy briefs to promote integration of agroforestry into institutions.

Two previous MTP projects that will be maintained include those of the Systemwide and Ecoregional Programmes (SWEPE) – the African Highlands Initiative (now labeled as *Global Project 10*) and the ASB Partnership for the Tropical Forest Margins (now *Global Project 11*). The contents of these two SWEPE projects are currently under review and likely change in the next year or so. But any change will be closely aligned with the other nine Global Projects.

#### 4. Collaborative strategies

The World Agroforestry Centre will ensure successful implementation of the 11 Global Projects through strong and strategic partnerships across a range of research, development and educational institutions, from national to global level. The Centre will remain committed to working through collaborations within the Alliance of CGIAR Centres as well as with institutions outside the CGIAR.

##### **Partnerships in the CGIAR**

Within the CGIAR, the World Agroforestry Centre is engaged in strategic alliances with other centres of the Alliance as well as with System-wide and Ecoregional Programmes, Challenge Programmes and other Global and regional initiatives.

- **Strategic alliances with other centres:** In 2006, the World Agroforestry Centre and the Centre for International Research in Forestry (CIFOR) successfully launched a Biodiversity Platform to focus and integrate our joint activities in tropical forest landscape mosaics. Establishment of the Platform benefited greatly from the Swiss Development Corporation, which is funding a full-time senior scientist as coordinator, and the Finnish Ministry of Foreign Affairs, which has appointed two Junior Programme Officers to support the development of projects.

This alliance with CIFOR provides a key platform for implementation of *GP1*, *GP3*, *GP5*, *GP6*, *GP7* and *GP8*. While the World Agroforestry Centre will leverage its strengths in agroforestry research for development, CIFOR will mobilize its methodological approaches to enhancing forestry policy and practice for livelihoods and environment. The World Agroforestry Centre also continues its joint engagement with ILRI on shared

support services and facilitation of the CGIAR integrated action plan for research in Eastern and Southern Africa. In the West and Central Africa, Eastern and Southern Africa regional action plans, the World Agroforestry Centre will seek to foster alignment of integrated natural resource management principles to enhance regional expression of CGIAR System Priority 4.

- **System-Wide Ecoregional Programmes:** The World Agroforestry Centre continues to broadly contribute to SWEPEs of the CGIAR, and maintains its strong engagement with and hosting of ASB and the AHI. As a result of the successful review and partnership accolades in 2005 and 2006, ASB remains an attractive platform for cross-institutional collaboration in research in the tropical forest margins. The World Agroforestry Centre supported ASB's rebranding as a global 'Partnership for the Tropical Forest Margins', a label consistent with its evolving research priorities. In 2006, ASB bid farewell to its Coordinator, Dr Thomas Tomich, who left for the University of California, Davis. Dr Brent Swallow was appointed interim Coordinator to facilitate a rejuvenation of the global research agenda. The AHI also continues to set the pace in action-oriented research focused on managing agriculture and natural resources at the community level. The AHI successfully transitioned to a new leadership in January 2007 with arrival of Dr Jeremiah Mowo. In addition to ASB and AHI, the Centre continues to participate in the Genetic Resources Programme (*linked to GP2*), the Initiative on Water Management (*linked mainly to GP3 and GP6*), the Desert Margins Programme (*linked to GP6*), and the cross-centre research on Collective Action and Property Rights (*linked to GP8*).
- **Challenge Programmes:** The World Agroforestry Centre's participation in Challenge Programmes (CPs) remains far below expectations. This may be partly due to the fact that the current set of the CPs are oriented towards research in commodity crops or are in other ways beyond the Centre's niche and scope. Nevertheless, opportunities exist for constructive engagement in the Sub-Saharan Africa CP, which will benefit immensely from the Centre's approach to integrated natural resource management research. In addition to the SSA-CP, the Centre is strongly positioning itself for a more proactive approach to the CPs currently under consideration, three of which are strategic for several of the Centre's Global Projects. The proposed Oasis CP has direct links to *GP6*; Climate Change CP is linked to *GP7*; and the one on high-value fruits and vegetables to *GP2*, *GP3* and *GP4*.

- **Other global and regional initiatives:** The World Agroforestry Centre continues its engagement in the Amazon Initiative (AI) as a strategic approach to agroforestry research for development in Latin America. The Secretary of the AI reports jointly to the World Agroforestry Centre and CIAT. Other collaborating centres are Bioversity, CIFOR and the International Food Policy Research Institute (IFPRI) – with the prospect of additional centres joining the initiative in the near future. Other collaborators include six national research systems of the Amazon countries plus an increasing network of Amazonian universities, research institutes and NGOs. The World Agroforestry Centre supported the proposal to Science Council pushing for transformation of AI into a SWEP.

### **Non-CGIAR Partnerships**

Outside the CGIAR, the World Agroforestry Centre continues to harness new opportunities for agroforestry research for development by engaging with mainstream development institutions, international non-governmental organizations, regional and sub-regional organizations and national agricultural research systems. In addition, the Centre has strong links with major organizations in the private sector.

- **Development partners:** The World Agroforestry Centre is exploring links with initiatives of the New Partnership for Africa's Development (NEPAD). In addition to technical backstopping for TerrAfrica, the implementation mechanism for NEPAD's strategy on sustainable land management, the Centre has also formalized links with the NEPAD Office of Science and Technology to support the development of soil science capacity building initiative for African universities. This engagement will be strategic for implementation of *GP6* and *GP9*.
- **Non-governmental organizations:** The Centre has a well-established alliance with Conservation International that focuses on improved livelihoods and sustainable landscapes (*linked to GP5, GP6, and GP7*) and strengthening institutions for integrated conservation and development (*linked to GP9*) in tropical biodiversity hotspots. Joint initiatives are being developed through this alliance for implementation in Southeast Asia (Indonesia and Philippines) and Africa (Madagascar).

In 2006, the Centre explored two new and substantive partnerships with NGOs. A partnership with the World Wildlife Fund (WWF-US), a not-for-profit international conservation organization based in Washington DC, focuses on collaboration around community-based carbon sequestration to

tap into emerging international carbon markets. The objective of the alliance is to deliver cost-effective climate change mitigation options while promoting biodiversity conservation, sustainable land use, and improvements in rural livelihoods that reduce poverty. This partnership will be strategic for delivery of *GP7*.

A second alliance was with the Academy for Educational Development (AED), also a US-based international consulting firm, which uses innovative communication tools to promote uptake of science-based options for poverty reduction, food security and environmental sustainability. The Centre initiated discussions on a major joint initiative with AED on scaling-up improved agroforestry options in Eastern and Southern Africa. The focus of the initiative will be on income-generating enterprises based on integrated fodder and soil fertility improvement systems, which are key components of *GP1, GP3* and *GP4*.

Other strategic alliance opportunities are being explored with CARE and World Vision to leverage agroforestry options to enhance livelihoods in Africa and Southeast Asia.

- **Regional and sub-regional organizations:** In sub-Saharan Africa, the World Agroforestry Centre has established strong links with the Forum for Agricultural Research in Africa (FARA) for major initiatives to support transformation of the continent's agriculture. These initiatives include one on Building Africa's Scientific and Institutional Capacity (BASIC), which will benefit immensely from the Centre's research-for-development agenda. The Centre is also strongly linked to subregional organizations in West and Central Africa ( West and Central African Council for Agricultural Research and Development, CORAF), Eastern and Central Africa (Association, Association for Strengthening Agricultural Research in eastern and Central Africa, ASARECA) and Southern Africa (Food, Agriculture and Natural Resources network, FARNPAN) for implementation of integrated natural research management initiatives.
- **National Research Systems (NARS):** The World Agroforestry Centre will continue to build on its strong tradition of working with NARS partners in all countries where it is engaged in research for development. The Centre considers NARS partners vital links for grounding agroforestry in the context of national agricultural, forestry, environment and economic development priorities. NARS partners include academic (universities) and research institutions. Although work with NARS partners is mostly through donor-funded projects,

alliances such as the Network for Agriculture, Agroforestry and Natural Resources Education in Africa (Network for Agroforestry, Agriculture and Natural Resource Management Education - ANAFE) and Southeast Asia (Southeast Asia Network for Agroforestry Education, SEANAFE), and the Amazon Initiative (see above) are strategic for leveraging agroforestry impacts nationally. This will be a key factor for pursuing the Centre's vision of a global agroforestry transformation.

- **Private Sector:** The World Agroforestry Centre is currently engaged in major global alliances with Unilever and Mars Incorporated on research to enhance market value chains for high-value agroforestry tree products (linked to *GP2*, *GP3*, and *GP4*). It is also envisaged that the alliances will help leverage opportunities for smallholder climate change mitigation (carbon sequestration) and adaptation (on-farm diversification) initiatives linked to *GP7*.

## 5. Financial Indicators

### a. *Financial outcomes in 2006*

The World Agroforestry Centre's total nominal income (unadjusted for purchasing power) increased by about 1.5%, from US\$31.01 million in 2005 to US\$31.47 million in 2006. The increase was mainly due to exchange gains on unrestricted grant income due to a weak US dollar relative to other major donor currencies. Of course, the view is less encouraging when judged in price-adjusted terms.

Total expenditure increased by 6%, from US\$30.49 million in 2005 to US\$32.33 million in 2006. This increase is attributed to accelerated implementation of research activities in 2006, funded mostly from restricted grants. In addition, the Centre invested US\$0.35 million in replacement of equipment from the designated net assets.

Changes in net assets for the year 2006 reflect a deficit of US\$0.85 million, compared to a surplus of US\$0.52

million in 2005. The unforeseen non-delivery of EU funds amounting to \$1.47 million, a decision that was communicated to Centre in December, drastically changed our year-end financial position. As a result, the total unrestricted net assets in the Centre reduced to US\$13 million. This translates to 82 days of cash expenditure. The Centre's working capital as of year-end was equivalent to 140 days of cash expenditure. These figures measure long-term and short-term solvency of the Centre, respectively.

These indicators are above the lower thresholds recommended by the CGIAR's Secretariat. The 2006 outcomes were approximately 9% above the estimates reported in the MTP submitted in June 2006 for income and expenditure.

### b. *Financial estimates for 2007*

Total nominal income for 2007 is estimated at US\$31.1 million, an increase of about 4% compared to our MTP proposal submitted in June 2006. Expenditure in 2007 is estimated at US\$31.1 million, reflecting an increase of about 4% compared to the figure presented in June 2006. This increase is largely the net result of the anticipated funding from the EC at double the projected contribution for 2006 and the withdrawal of unrestricted core of approximately US\$0.5 Million from Denmark. For 2007, there is no anticipated increase in net assets and there are no proposals to draw from reserves to pay for operations.

### c. *Financial proposal and plans 2008-2010*

The financing plan for 2008 included in the 2008-2010 MTP is based on known or highly probable sources of future grants. The Centre is being highly conservative in including probable sources in the 2008 financing plan, and we expect some moderate changes in the 2008 proposal. The plans for years 2009 and 2010 have been extrapolated on the basis of the 2008 financing plan, assuming a 5% average growth rate.



# MTP Narratives

## Global Project 1: Multiscale Assessment of Agroforestry Impacts

### Rationale

#### Project goal

To improve agroforestry research and development investments through a better understanding of how agroforestry innovations can provide benefits across varying landscapes, communities and people.

#### Project objectives

1. To develop methods for *ex post* and *ex ante* assessment of agroforestry impacts at different spatial scales.
2. To conduct strategic *ex post* studies of the impacts of agroforestry across different agro-ecological zones for distilling success factors for creating impact at scale.
3. To analyze the opportunities, constraints and tradeoffs for agroforestry to benefit different types of smallholder farmers across different market and agro-climatic conditions.
4. To provide targeting and other information to guide investments in agroforestry research and development.

#### Problem diagnoses

Although agroforestry is increasingly being considered in research and development initiatives, there is a need to continually update the global knowledge base about priority investment opportunities in both research and development. One aspect of the knowledge base is awareness of the various ways in which agroforestry can make a significant impact on livelihoods and the environment. Lack of data on the contribution of agroforestry to household and national economies as well as to the environment constrains policy makers and development organizations in using agroforestry as a potential intervention to improve livelihoods.

A second aspect is the knowledge of which agroforestry systems or species are 'best fits' in particular niches in the landscape, which ones can solve certain types of land degradation problems, generate significant revenue for smallholders or have the best chance of benefiting women or other vulnerable groups.

These two areas are among the priority knowledge gaps this project aims to fill.

Lastly, in order to increase the generation and use of evidence about agroforestry impacts, this project will also develop improved research methods and facilitate their dissemination to national and international partners. The World Agroforestry Centre is well placed to do this because we have already developed a number of methods to help analyze the complex impact pathways of agroforestry systems.

As important as knowing 'where' different agroforestry systems can best make a difference is having the know-how to apply various interventions. This project will contribute to global investment strategies in two ways. Firstly, through a better understanding of the types of investments required to foster significant agroforestry transformations. This may include institutional and policy reforms or strengthening as well as public investments. Among these investments, considerable emphasis will be devoted to identifying more effective methods for the diffusion of agroforestry innovations to and between smallholder farmers.

Secondly, we will seek to better articulate and quantify the costs, risks, benefits and tradeoffs of agroforestry investments so that they may be more readily considered in programmes and projects. Up to now, inability to quantify possible income or productivity gains through agroforestry has limited its inclusion in development initiatives.

#### Links to CGIAR System priorities

The project is primarily linked to **5D** (Improving research and development options to reduce poverty and vulnerability), with specific contributions to improving *ex ante* and *ex post* risk management through agroforestry and improved characterization of the rural poor in relation to agroforestry opportunities. and **3D** (Sustainable income generation from forests and trees) on providing policy advice and a range of options that allow for tradeoffs between stakeholders, services and products. Secondary links are to **3A** (Increasing income from fruit and vegetables), **4A** (Integrated land, water and forest management at landscape level), **4D** (Sustainable agro-ecological intensification in low and high potential environments), **5B** (Making international and domestic markets work for the poor), and **5C** (Rural institutions and their Governance ),

## **Alterations in project composition and outputs**

There is a whole new formulation of World Agroforestry projects, and this project was created afresh to fill an underdeveloped research topic. It includes all of the former outputs under LP2.1 and large parts of LP3.1, LP 3.2 and TM2.3. It will also coordinate and synthesize monitoring and impact methods research that was previously diffused, for example in LP1.1, LP2.2 and ES2.1.

## **Description of Impact Pathways**

This project encompasses the following two Outputs:

- GP1.1. Agroforestry opportunities and priority investment areas identified, assessed and recommended (*targeting, ex ante assessment, constraints to adoption, analysis of dissemination and diffusion methods*)
- GP1.2. Agroforestry impacts on livelihoods and landscapes assessed and analyzed (*ex post assessment, adoption, livelihoods, welfare, environment, success factors*)

### **Output-outcome-impact pathway**

This global project will deliver the following CGIAR Output Targets:

**Practices:** (1) Tools and methods for *ex ante* and *ex post* and tradeoff assessment at different scales, emphasizing complex interactions common with agroforestry systems; (2) approaches and methods for effective dissemination and diffusion of agroforestry innovations to and between farmers.

**Policies and Strategies:** Strategies and approaches for creating impact of agroforestry systems at scale, including sets of interventions required and indicative investment needs.

**Other Knowledge:** (1) major opportunities for agroforestry development and their targeting; (2) identification of key constraints for adoption of agroforestry systems; (3) success factors for creating agroforestry impact at scale; (4) actual impacts of agroforestry on welfare and the environment at different spatial and temporal scales.

**Capacity:** Capacity built on (1) use of best practices for assessment of agroforestry and NRM impacts; (2) best practices to communicate the impacts of agroforestry systems to policy makers, development organizations, and other stakeholders.

Jointly, these output targets are envisaged to produce the following *Outcomes*:

- Increased awareness and recognition of the potential benefits and constraints of agroforestry in development strategies and policies.
- Better informed decisions by agroforestry

programmes or projects and other development partners as to appropriate agroforestry systems, species, and methods for their dissemination and diffusion.

- Increased ability among agroforestry research, development, and policy stakeholders to determine investment opportunities and returns to agroforestry.
- Improved capacity for impact monitoring and assessment in agroforestry and NRM.

In the long term, these outcomes are intended to lead to national and international organizations making investments in agroforestry that are more effective in creating livelihood and environmental impacts at scale.

### **Conditioning factors**

Possible constraints to achieving the outcomes and impacts are:

- Conducting analyses of methods, institutions, and systems at scales present research challenges for the project.
- Fragmentation of agroforestry across ministries, departments and agencies makes it difficult to achieve optimal coordination and implementation.
- Lack of recognition of agroforestry potential (and possibly incentives) to generate significant income and in reasonable periods of time is a major bottleneck.
- Difficulty in quantifying many benefits of agroforestry systems may reduce its attractiveness to mainstream investors.

### **Centre partnerships and capacity strengthening**

To achieve the outcomes and impacts, we need to link strongly with major development initiatives and engage in relevant international conventions (external/internal and public/private) that will demand and can act upon information generated in the project. The names and roles of partners are provided under 'Elaboration of Partners' Roles' below. Capacity strengthening is indeed a core element of this project, as indicated in the objectives, output targets and also in the section 'Additional Roles Beyond Research'.

### **Target ecoregions**

For Output GP1.1 (*ex ante*): Ideally, the World Agroforestry Centre aims to identify the priority agroforestry investment opportunities in all the major agro-ecological zones (AEZ) within its tropical developing country mandate. However, medium-term priority will be given to areas in which the expected payoffs to agroforestry investment are high and where there is a high chance that such investments can be made.

### 1. In sub-Saharan Africa

Regional EAZ 1 Warm arid and semi-arid tropics (AEZ 1)

RAEZ 2 Warm subhumid tropics (AEZ 2)

RAEZ 3 Warm humid tropics (AEZ 3)

RAEZ 4 Cool tropics (AEZ 4)

### 2. In Asia

RAEZ 8 Warm arid and semi-arid tropics (AEZ 1)

RAEZ 10 Warm humid tropics (AEZ 3)

### 3. In Latin America

RAEZ 17 Warm humid tropics (AEZ 3)

### **Beneficiaries and end users**

The key clients and major users of the outputs generated in this project are:

- Funding agencies (World Bank, FAO, DFID, Asian Development Bank, ACIAR, Ford Foundation).
- Development organizations (notably extension systems and international NGOs such as World Vision and CARE).
- National policy makers and programmes.
- Research organizations involved in agroforestry and researchers involved in evaluation.
- International conventions such as those on agriculture, forestry, environment, trade and desertification.

The end beneficiaries of the information will be smallholder farming communities throughout the developing world who will gain from the uptake and implementation of the project's outputs by the clients noted above.

### **Centre's roles**

1. Mobilize research partnerships from different regions of the world and resources to generate research on important agroforestry systems in the major RAEZs, emphasizing the learning of lessons on how major agroforestry systems became successful.
2. Evaluate major constraints and opportunities for agroforestry across major RAEZs and identify priorities for research and development.
3. Develop methods for the *ex post* and *ex ante* assessment of agroforestry impacts — as well as costs and risks — of both a scientific and practical nature used by a variety of agroforestry investors and users.
4. Build a cadre of experts and a community of

practice among research and development organizations in the use and improvement of impact assessment methods for agroforestry.

## **Research approach to develop International Public Goods (IPGs)**

### **Advantage of project for generating IPGs**

The project will be implemented in several important ways to foster the generation of IPGs. First, the project will operate across different regions with different agro-ecological and institutional settings. This will enable it to test fundamental hypotheses on the impact of agroforestry and draw out more widely applicable lessons.

Second, the project will build a bridge to the professional evaluation communities and to advanced research institutes that use complex models and scenarios that will help to bring the finest science to assessing the impacts of agroforestry across different spatial and temporal scales.

Third, and related, the project will enhance the capacity for using such tools and methods among researchers in other organizations to enhance the potential for high quality research outputs in the future. Fourth, the major outputs in the project are linked so as to enhance their value and IPG nature. For example, *ex post* assessment results feed directly into *ex ante* models, which, in turn, are used to help establish priority investments in agroforestry research and development.

### **IPG nature of outputs**

The major outputs listed above are outputs of international relevance. In particular:

- The identification of priority agroforestry constraints and investment opportunities will be in relation to underlying conditioning and driving factors and are thus relevant across numerous countries and regions.
- Identification of success factors in creating impact at scale through agroforestry that can be applied by policy makers, private sector, farmers, and other investors in many countries.
- Similarly, lessons for creating agroforestry impacts for specific target groups, such as women and the poorest households, will be identified through studies in several locations and be globally relevant.
- The methods developed for *ex ante* and *ex post* impact assessment will be useful for research and development users across the developing world.

### ***Additional roles beyond research***

In addition to the instrumental uses like the knowledge products listed above, there is also the function of facilitating the transformation of outputs to outcomes. In order to do this effectively, the project will develop an information database on agroforestry adoption and impacts, including tools, methods, and empirical information. It will link to other websites and databases carrying similar information, and, where possible articulate these within the indicators and targets of the Millennium Development Goals (MDGs).

The project will actively disseminate the empirical results and lessons of the project and endeavour to provide the best information on potential agroforestry benefits, costs, risks and constraints to investors in agroforestry. One way to achieve this will be by focusing on major development initiatives in which agroforestry is likely to be an attractive option. These initiatives include tree enterprise development, sustainable land management or carbon sequestration programmes. Secondly, the project will join forces with GP9 to facilitate access to research results by key national institutions in selected countries in Africa, Asia, and Latin America. It will do this both proactively and in response to demands for services from investors in agroforestry research and development.

Finally, although capacity building is listed as a bona fide output, it is useful to mention its elements in this project. The World Agroforestry Centre has developed a number of new methods and techniques for impact assessment, especially at landscape scales and has been actively promoting their application and training others on how to use them. The Centre will continue to create awareness on such methods and techniques through training within the Knowledge-to-Action paradigm. The GP1 project also recognizes that improvements in impact assessment methods emanate from many organizations and sectors and will, therefore, support a community of practice in impact assessment for agroforestry in which experts in evaluation can be better linked to practitioners in national research and development organizations.

### **Elaboration of Partners' Roles**

#### ***List of major collaborators***

Since some of the objectives of this project are newly formulated, there is also mention of future partners with whom concept notes have been developed or discussions held.

On the research side, the World Agroforestry Centre is already involved in a long-term impact study in

East Africa with close collaboration with ILRI and the Foundation for Advanced Studies in International Development (based in Tokyo). National partners include Makerere University and Tegemeo Institute of Egerton University. Further linkages will be forged with the Trees on Farm Network and East and Central African Programme for Agricultural Policy Analysis of ASARECA.

In Southern Africa, World Agroforestry has conducted adoption and impact studies with the University of Florida, University of California, Berkeley, and local universities. The Centre has engaged in a collaborative project with ICRISAT, and is now engaged in discussions with FANRPAN for collaborative work in many areas including impact assessment.

In West Africa, the World Agroforestry Centre has had a long-term partnership with the Overseas Development Institute and University of Laval for studies of farmer uptake of agroforestry.

In South Asia, key collaborators in impact assessment include IWMI, GBPUAT (Govind Ballabh University of Agriculture and Technology), and the Indian Council for Agricultural Research. Plans for additional impact studies have been made with the National Centre for Agriculture Policy Research. Finally, in Southeast Asia, The World Agroforestry Centre has collaborated with Hohenheim University and several national universities and research institutes such as Indosesian Soil research Institute (ISRI) and Indonesian Research Institute for Estate crops (LRPI).

In future, The World Agroforestry Centre is already in discussions with IFPRI for *ex ante* impact assessment research. It will also strive to strengthen strategic collaboration with CIFOR, the Institutional Learning and Change group of the CGIAR, Michigan State University, the University of Florida and FARA.

This project will also collaborate with major development initiatives as they help to create laboratories for learning about creating impact at scale — and at the same time are key clients for project outputs). Many of these initiatives are taking place in Africa and the World Agroforestry Centre has already begun some forms of collaboration. These include NEPAD's TerrAfrica initiative and other programmes under the Comprehensive African Agricultural Development Programme (CAADP). World Agroforestry is also collaborating with the Earth Institute of Columbia University to assess the impact of agroforestry in the Millennium Villages Project. It also aims to work with the Swedish VI Agroforestry programme active in countries bordering Lake Victoria. Lastly, there are to collaborate with WWF and World Vision across numerous sites of Africa, Asia, and Latin America.

### **Strategic roles of different partners**

The World Agroforestry Centre seeks conceptual and methodological inputs and support from advanced research institutes such as FASID (Foundation for Studies in International Development), Michigan State University and the University of Florida and other CGIAR centres such as IFPRI. Other specialized CGIAR centres such as ILRI and IWMI are important to be able to assess certain impacts of agroforestry, for example on milk production or water use. The World Agroforestry Centre's collaboration with FASID and ILRI in East Africa brings together complementary skills in assessing crop, livestock, trees and soils related impacts. Similarly, the Centre collaborates with IWMI to assess the hydrological impacts of agroforestry systems at scale, such as in India. The Centre has also collaborated on several projects with IFPRI in the past including an *ex post* assessment of fertilizer trees in western Kenya. But Centre is keen to work more closely with IFPRI on *ex ante* studies (for instance on smallholder timber), utilizing IFPRI's impact modeling and forecasting skills. The Centre's is collaborating with ICRISAT in southern Africa mainly to provide them with new tools for monitoring soil quality changes, while plans are underway to strengthen links with Michigan State University, which has been undertaking broad-based agricultural surveys in southern Africa to better contextualize its own impact assessment work in the region.

The Centre will also seek a partnership with the University of Florida on information databases on agroforestry impacts. Towards this end, the University of Florida will be a co-host of the Second World Congress on Agroforestry in 2009 and the two institutes will work together to synthesize the state of knowledge on adoption and impact for that event.

The Earth Institute's project is multisectoral and high profile. The World Agroforestry Centre's involvement on impact assessment with this group enables it learn and put into practice monitoring and evaluation systems as well as indicators across a broad set of sectors, particularly in health, gender, community empowerment.

The building of relationships with FANRPAN and ECAPAPA are intended to tap into their knowledge and connections with policy makers in Africa in order to strengthen the World Agroforestry Centre's ability to achieve its policy outcomes. Partnerships with national research institutions and universities enhance the quality of the research by bringing new perspectives, specialized information, different skills mixes and a degree of external objectivity to the impact research.

Finally, as mentioned, partnerships with major development partners and programmes are designed for the dual purposes of having access to a larger

number of learning laboratories as well as better understanding the research needs of likely clients for the project outputs.

### **SWP collaborations**

The World Agroforestry Centre is collaborating with the African Highlands Initiative Ecoregional programme in assessing its outcomes and impacts and to develop quantitative baselines for future assessment. Likewise, it continues to be a strong partner in the ASB Partnership for the Tropical Forest Margins in evaluating the impacts and tradeoffs of agroforestry systems across the humid tropics. Recently, the Centre has engaged in discussions on assessing the impact of integrated agricultural research for development methods within the SSA-CP. And finally, the World Agroforestry Centre has been an active participant in the formation of Flagship 2 of the regional Collective Action Plan for Eastern and Southern Africa in which the main objective is identifying approaches for achieving large-scale impacts agricultural research.

## **Global Project 2: Tree Genetic Resources and Domestication**

### **Rationale**

#### **Goal**

Smallholder farmers, their support agencies and researchers have access to information and knowledge needed to improve rural livelihood options through appropriately characterized, conserved and developed tree genetic resources, as well as well functioning seed and seedling systems.

#### **Outputs**

1. Innovative generic technologies and management approaches developed and promoted for characterization, domestication, and conservation of agroforestry tree genetic resources, within the context of current and emerging global challenges and opportunities.
2. Improved and sustainable technologies and strategies formulated for collection, procurement, multiplication, dissemination and deployment to meet demands of quality agroforestry tree genetic resources by farmers and stakeholders
3. Existing strategies improved and new approaches developed for documenting and disseminating information on the use, domestication, distribution and management of agroforestry tree species genetic resources.

## **Problem diagnoses**

The World Agroforestry Centre seeks to contribute toward the Millennium Development Goals for the eradication of poverty and hunger, the promotion of social equity and mitigation of global concerns related to climate change and environmental degradation by understanding and promoting farm forestry in the tropics. Agroforestry systems are ubiquitous within the tropics and are characterized by a great diversity among and within tree species found within contrasting biological and complex niches. Such systems are of immense value for farmers, partners and markets. Although there are opportunities to improve and optimize productivity of agroforestry systems, the diversity within the systems pose major challenges in developing generic models and principles. The vast range of taxa, restricted current use, lack of market integration and particular biological characteristics mean that much variation remains untapped to improve livelihoods and environments within the context of current and emerging global challenges and opportunities. GP2 is designed to resolve fundamental problems that constrain effective productivity of tree genetic resources tree and domestication. Such problems include the following:

- Constraints to tree domestication, characterization and conservation, such as:

- Limited biological understanding of the range of useful tree species.* This is due to the perennial nature, life history traits (e.g. dioecy) with long generation intervals in working with tree propagation and growth. To overcome this limitation there is a need to modify and update priority setting exercises for agroforestry species due to changing requirements influenced by markets, niches, climate change and biotechnology, among other reasons. Related problems that need to be addressed include a limited understanding and documentation of performance and productivity between exotic, indigenous and naturalized species; poor knowledge on nutritional and therapeutic values of indigenous species in agricultural landscapes; lack of adequate approaches and knowledge that allow multiple species to be domesticated.
- Absence of innovative tools and protocols for understanding genetic level diversity and conservation of tree germplasm.* Challenges in this area include lack of knowledge on appropriate *ex, circ* and *in situ* conservation strategies, longevity and practicality of maintaining live gene banks of taxa with large growth forms, diversity

among biological specificities of the range number of species involved (for instance, recalcitrance, reproductive biology and phenology) and different niches. Other problems include limited knowledge available on adaptability in response to climate change and land degradation as well as methods that are ineffective, fragmented and unnecessarily costly. In addition, there is inadequate understanding and awareness of problems and benefits of managing intra-specific diversity; limited understanding of the role and importance of diversity in agroforestry systems; poor genetic quality in founder populations of tree seeds being released by development projects; potential risks of loss of tree vigour resulting from inbreeding and poor management of tree genetic diversity on-farm and within landscape; dysgenic selection; limited knowledge of phenotypic plasticity of priority tree species; lack of comprehensive guidelines and indicators for managing intra-specific diversity; and *ex ante* impact assessments of genetically modified trees in agroforestry landscapes lacking.

- Scarcity of innovative tools and methodologies for tree propagation and management:* Key problems include lack of generic protocols for participatory selection of priority agroforestry species in different agroecological zones, taking emerging global issues into consideration; lack of global guidelines for domestication for researchers and stakeholders; lack of methodologies for elite clonal selection and development of cultivars of indigenous tree species (current methodologies are for exotic species); and the challenge of repeatability due to long generation time. Other challenges include limited knowledge of tradeoffs between biotechnological (tissue culture and genomics), participatory and non-participatory domestication approaches to tree improvement for agroforestry species; and lack of case studies to help extrapolate generic technologies. There is also lack of continuous monitoring and improvement of tree genetic resources and fine-tuning of management practices in different niches, improve farmer uptake, which is below species saturation level due to lack of tested alternatives. In addition efficient procedures for better-adapted indigenous species are often unknown, resulting focusing in few

exotic taxa, while current approaches are inflexible and often involve high market risks to producers thereby limiting adoption;

- Constraints to tree germplasm supply and availability: tree seed markets are poorly developed, hence availability and supply a problem. Tree seed supply is cited as a problem but tree seed demand is un-quantified; economics data on tree seed and seedling production is scanty; current practices of germplasm transfers cross-landscapes not well documented and the current ITPGR is not relevant to most tree genetic resources. Other problems include a focus on tree seeds and not tree seedlings; lack of farmer-saved tree seed projects; lack of appropriate models for tree germplasm supply to farmers; and inadequate analysis of the cost effectiveness, required incentives, and quality and quantity considerations at a farm and landscape level. Furthermore, data on phenomena such as inbreeding and outbreeding in agroforestry tree species at farm and landscapes levels not widely available; while farmer access to germplasm of good physiological and genetic quality of a range of tree species is limited, leading, in turn to, limited adoption and the planting of a few readily available species only. Uniform farm landscapes are not conducive to maximizing productivity and sustainability while addressing market and environmental risks.
- Constraints to documenting and disseminating information on the use, domestication, distribution and management of agroforestry tree species genetic resources. Challenges in this areas include lack of appropriately presented information — in different formats and with the right amount of detail — to guide farmers, scientists, CBOs, NGOs and other stakeholders on the availability, management and use of the wide range of different

Agroforestry tree species. Other problems include unavailability of accessible agroforestry databases to guide stakeholders in species selection for specific functions; lack of methods for recording current activities on the distribution, domestication and on-farm management of the wide range of agroforestry tree genetic resources, hence there is lack of learning from these activities. Research is on going on many agroforestry species and there is therefore a need for continuous updating of information. In contrast to annual crops, comprehensive information on tree germplasm is lacking as are databases developed with stakeholders and comprehensive guidelines on management tree genetic resources. Tree species knowledge is also not freely available for all stakeholders.

### ***Alterations in project composition and outputs***

GP2 is an enhanced and combined formulation of the previous projects TM1 (Agroforestry Tree Germplasm) and TM2 (Tree Domestication)

### ***Alignment with CGIAR System Priorities***

Project GP2 has three major outputs aligned with CGIAR System Priorities. These priorities include **1B** (Conservation/characterisation of under-utilized Plant Genetic Resources); **2D** (Genetic enhancement of selected species to increase incomes); and **3A** Increasing income s from fruits and vegetables. Other links are to priorities **4A** (Integrated land, water and forest management) and **5D** (Improving R&D options to reduce rural poverty and vulnerability). The Centre's work under output GP2.3 (Seed and Seedling Systems), however, goes beyond System Priorities and is listed as a new research area and development activity.

## Description of Impact pathways

The output-outcome-impact results chain for GP2 is summarized in the diagram below.

Outputs	Outcomes	Impacts
GP2.1 Innovative Generic technologies and management approaches developed and promoted for characterization, domestication, and conservation of agroforestry tree genetic resources, within the context of current and emerging global challenges and opportunities.	Sustainability and productivity of agroforestry systems improved as farmers and other stakeholders domesticate, utilize and conserve broader range of important tree species in more optimal ways, thereby promoting current and future use.  Adoption of appropriate tree species for greater feasibility, climatic adaptability and profitability enhanced with: i) Availability of quality tree genetic resources and innovative management practices; ii) Updated and improved information facilitating utilization and management of tree genetic resources.	Sustained and productive agroforestry systems contributing towards alleviation of poverty and food security and protection of the environment.
GP2.2 Improved and sustainable technologies and strategies formulated for collection, procurement, multiplication, dissemination and deployment to meet demands of quality agroforestry tree genetic resources by farmers and stakeholders		
GP2.3 Existing strategies improved and new approaches developed for documenting and disseminating information on the use, domestication, distribution and management of agroforestry tree resources.		

More specifically it is envisaged that:

- Greater availability of demonstrably superior tree species and provenances will lead to increased tree planting by farmers.
- Participatory domestication with farmers will lead to more suitable and improved tree species.
- Well understood species x management x site interactions will lead to better cultivation practices and targeting of tree species.
- Farmer-led testing of species will lead to more adoptable tree management practices.
- Researching the dissemination and diffusion processes will lead to increased adoption and impact.
- Better quality founder populations will lead to greater intraspecific diversity of trees cultivated on farm.
- Greater availability of well-documented and quality germplasm will lead to increased species diversity in nurseries and on farm.
- Proper characterisation of tree germplasm will lead to more efficient and effective conservation.
- Freely available and comprehensive knowledge on tree species will lead to greater recognition of role of trees and

increased tree cultivation.

- Decentralised tree seed systems will lead to greater sustainability than centralised ones.
- Higher quality tree seed will lead to increases in nursery and farmer demand.
- Well-informed and supported tree nursery operators will lead to filling of gap in extension on tree seed and tree species cultivation.

Within Global Project 2, World Agroforestry will work with a variety of partners and actors and will play the roles of primary research provider, facilitator and advocate.

### **Target ecoregions**

Research under GP 2 is carried out in the following eco-regions:

#### **1. In sub-Saharan Africa**

RAEZ1 Warm arid and semi-arid tropics (AEZ 1): West Africa: Mali, Niger, Senegal, Burkina Faso; East Africa: Ethiopia, Kenya, Tanzania; Southern Africa: Malawi, Mozambique, Zambia and Zimbabwe.

RAEZ 2 Warm sub-humid tropics (AEZ 2): East Africa: Uganda; Southern Africa: Malawi, Mozambique, Zambia and Zimbabwe.

RAEZ 3 Warm humid tropics (AEZ 3): Cameroon, DR Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Ghana, Nigeria.

## 2. In Asia and the Pacific

RAEZ 8 Warm arid and semi-arid tropics (AEZ 1): India and Thailand.

RAEZ 9 Warm sub-humid tropics (AEZ 2): India, Sri Lanka and Thailand.

RAEZ 10 Warm humid tropics (AEZ 3): Bangladesh, Indonesia, Laos, Philippines, Sri Lanka and Thailand.

RAEZ 11 Warm arid and semi-arid subtropics with summer rainfall (AEZ 5): China, India.

## 3. In Latin America and the Caribbean

RAEZ 17 Warm humid tropics (AEZ 3): Brazil, Peru.

### **Beneficiaries and end users**

The primary beneficiaries of GP2 are national tree seed agencies, farmers, tree nursery operators, national forestry and agroforestry research institutes, NGOs, universities and extension agents. The end users of the tree knowledge and tree germplasm produced by the project include: community based organisations, development agencies, extension agents, farmers, inter-governmental bodies involved in germplasm transfers, international Research Institutions, local policymakers and national policymakers, national research institutions, non-governmental organizations, producer associations and regional bodies involved in germplasm regulation, and tree seed marketers.

### **Research approach to develop International Public Goods (IPGs)**

The two main types of International Public Goods (IPGs) produced by this project are tree knowledge and tree germplasm. While substantial knowledge on trees in commercial plantations and natural forest exists, information on trees for on-farm cultivation is not readily available. Nearly 5000 tree species have been listed as occurring on farms in the tropics but information on their genetic make-up, management, propagation and conservation is lacking. Yet the wide bioclimatic suitability of such a large number of both exotic and indigenous species means this knowledge has a high IPG value. Tree knowledge produced by this project includes general and species specific information. Both types of knowledge take the form of strategies, guidelines, domain recommendations, practices, methods and protocols. The germplasm IPGs are produced at village and national levels.

Tree germplasm collected, conserved and produced by the Centre is used to establish populations for research and multiplication across national boundaries. Farmer-developed varieties (populations and clones) may be shared internationally, especially when part of a pre-agreed network and when *sui*

*generis* IPR protection systems operate. Nationally developed germplasm at species, provenance and clonal levels are encouraged to be part of multilateral system.

### **Elaboration of Partners' Roles**

The World Agroforestry Centre collaborates with international, regional and national partners to produce the outputs and promote achievement of the outcomes and impacts of GP2.

The international partners primarily assist in molecular genetics work for marker-assisted selection, development of strategies, databases, international policy formulation, multilateral conservation efforts, and advocacy. The international partners include the following: ARCS Siebersdorf, Australian Tree Seed Centre, CAB International, CIFOR, CIRAD, Danish Forest Seed Centre, European Forestry Institute, Food and Agricultural Organization (FAO), Ghent University, International Centre for Under-utilised Crops, IITA, Bioversity, International Society Horticultural Science, Scottish Crop Research Institute and Winrock International.

The regional partners primarily assist in regional networking and conservation efforts. The regional collaborators include: CORAF, COMIFAC, APAARI, ASARECA/TOFNET, Centro Agronómico Tropical de Investigación y Enseñanza (CATIE), Forum for Agricultural Research in Africa (FARA), FORNESSA and SADC Tree Seed Centre Network.

The national partners primarily engage with the Centre in developing and testing methods, developing improved germplasm and propagation methods, conservation of individual tree species, and assembling range-wide collections. The national partners include: national tree seed centres; national agricultural research institutes, national horticultural institutions, national forestry research institutes, universities, national health authorities (for fruit and medicinal species), national extension systems, and national quarantine authorities. In addition, national NGOs and CBO partners will be engaged on scaling up research.

### **Global Project 3 –Tree-based Diversification and Intensification of Smallholder Agriculture**

#### **Rationale**

#### **Project Goal**

Smallholder farmers and their support agencies have access to the knowledge needed to improve rural livelihood options through appropriate intensification and diversification of farming systems.

## **Project objectives**

1. To understand economic opportunities of diversified and intensified agroforestry systems, including options for tree crops, and develop principles and guidelines for improved agroforestry management and integrating agroforestry on tropical smallholder farms.
2. To better understand the tradeoffs between economical, environmental and cultural benefits of changes in tree species richness and evenness within tropical smallholder farming systems.
3. To assess the efficiency of water productivity and use of agroforestry systems and to develop strategies for a sustainable water management and adoption of agroforestry on small farms.
4. To develop methods for mixed agroforestry systems that can explore and predict consequences of tree growth and economic benefits from diversified systems.

## **Problem diagnoses**

In recent years, many smallholder farmers around the world have seen little improvement in their welfare because agricultural productivity has stagnated, inputs costs have increased faster than outputs prices, while production and market risks remained high. Most farmers in the tropics are not insured and rely on local social networks — that may well share the same exposure to risk factors — for this function.

Following the recommendations of agricultural advisors, many farmers have also become less insulated from risk because they now focus on monoculture production or on only one dominant farming enterprise. At the same time, fragmentation of tropical landscapes has resulted in declined availability (and increased costs) of products and services previously obtained from natural ecosystems adjacent to farming areas. Whereas agroforestry systems can play an important role by providing new sources of ecosystem products and services, there is lack of information on the best ways to diversify agroforestry systems for optimal benefits to both the small-scale producers and the global community.

Climate change and rainfall variability as well as land degradation and desertification are among the most important obstacles to the achievement of food (income) security and poverty reduction. It is also expected that a reduction of the planned, established and managed diversity of agricultural systems has impacted negatively on the stability of ecosystems, rendering them less able to cope with environmental shocks.

At the same time, there is a marketing niche for medium-scale tree production systems that can offer greater livelihood options to farming communities

than some well-established global monoculture cash crop production systems such as coffee, tea, rubber, cashew nut or cocoa.

Inadequate water supply is a major constraint to agricultural production in dry lands. In many cases, however, rains provide adequate quantities of water for optimal crop production but this water is lost, usually by overland flow, before the vegetation can use it. Water is also lost through poor tree management and landscape planning. For example, some fast-growing tree species such as eucalypts and acacias are increasingly depleting the environment because their fast growth is matched by higher water and nutrient consumption.

Local and ‘scientific’ ecological knowledge on tree selection and management on farms is hardly available or non-existent for most native tree species. There is therefore a dire need to generate such information, which could be used in strategies for integrating trees on small farms to increase food and tree crop productivity. Information is also lacking on the tradeoffs between economical and environmental benefits of indigenous tree species that are presently over-exploited in the wild and underutilized in agricultural systems.

This project specifically addresses the role of agroforestry in enhancing the performance of smallholder farming systems – increasing the productivity of associated crop and livestock systems, enhancing water use efficiency by trees, leading to more diverse production systems and generating income through high-value tree products. Rubber-based agroforestry systems in Southeast Asia, Shea tree-based parklands in West and Central Africa, cacao production systems in West Africa and Southeast Asia, coffee systems in Latin America, Africa and Southeast Asia and smallholder fruit and timber production in all three continents — especially where accessible forest resources have been depleted — are prime examples of how agroforestry can contribute to rural livelihoods. There are also vast opportunities for agroforestry to have wider poverty reduction impacts through market-driven and locally led tree cultivation systems, but these openings are not well understood by policy makers, development planners, researchers and donors. Hence, there is need for more research to demonstrate the existing use and impacts of these systems.

There is also a need to understand the principles of managing integrated systems and the synergies or tradeoffs between improved economic returns, short-term market production, pest and disease risks and long-term sustainability of the systems. The costs and risks of such intensified and diversified systems have to be understood. GP3 will focus on the farm-scale interactions between trees and livelihoods, in between the tree germplasm quality issues of GP2, the market

value-chain aspects of GP4, the landscape-scale interactions of GP5, the policy aspects of GP8 and the livelihood analyses of GP1.

### **Links to CGIAR System priorities**

- GP3 matches most closely with the CGIAR priorities **3D** (Sustainable income from forests and trees) mainly on approaches and options development for improving opportunities for the market exploitation of a range of forest products by the poor; **4C** (Improving water productivity), mainly on improving the management practices to enhance the productivity of water for diversified smallholder farming systems (Goal 1); and **4D** (Sustainable agro-ecological intensification in low and high-potential areas) on the following areas:
  - Improving the understanding of degradation thresholds and irreversibility, and the conditions necessary for success in low productivity areas (Goal 1);
  - Identifying domains of potential adoption and improvement technologies for improving soil productivity, preventing degradation and for rehabilitating degraded lands (Goal 3);
  - Improving soil quality to sustain increases in productivity, stability, and environmental services through greater understanding of processes that govern soil quality and trends in soil quality in intensive systems (Goal 5);
  - Designing methods to manage and enhance biodiversity to increase income, reduce risk and vulnerability through integrated pest management (IPM), crop diversification, and genetic diversity within crop species (Goal 6);
  - Optimizing productivity at high input use through understanding and managing spatial and temporal variation (Goal 7); and
  - Identifying social, economic, policy and institutional factors that determine decision-making about managing natural resources in intensive production systems (Goal 8).

GP3 will also contribute to **5D** (Improving R&D options to reduce rural poverty) on identifying agricultural research and development pathways, in order to implement options to reduce rural poverty.

### **Alterations in project composition and outputs**

This project is the result of aggregation and changes of research activities of a number of projects in the previous MTP, including LP2.2 (Integrated tree-

crop-livestock systems), LP2.3 (Improved water productivity), TM1.3 (On-farm management of tree genetic diversity) and partly with LP2.1 (Smallholder resources, livelihoods and strategies), TM2.2 (Tree improvement and management). Moreover GP3 provides the farm-level interface for some elements of other Global Projects as follows: GP5 on biodiversity conservation and trees in multifunctional landscapes; GP6 on erosion prevention technology and soil fertility enhancement); and GP7 on impact of climate change on agroforestry systems; as well adaptation to climate changes.

## **Description of Impact Pathways**

### **Output-outcome-impact pathway**

The World Agroforestry Centre and its partners and actors (Universities, NARS, ARIs, other CGs, Government institutions, NGOs, development agencies, CBOs) will actively engage in targeted research activities leading to the following three outputs for GP3:

- GP3.1 Principles, methods and options developed for improved agroforestry management, including their economic and ecological impacts on smallholder farms.
- GP3.2 Knowledge and options developed for improved water productivity and use in agroforestry systems including tradeoffs at the farm level.
- GP3.3 Knowledge of opportunities developed and promoted for agroforestry to improve agricultural productivity and to create greater system resilience and alternatives for income generation within smallholder farming systems.

### **Output-to-outcome**

Enhanced use of improved methods and information for research agendas on agroforestry systems for smallholder farms by researchers.

- Development programmes for smallholder farmers include agroforestry management options among intervention choices they consider, and use improved tools and knowledge to make more informed choices on integrating agroforestry into farming systems.
- Smallholder farmers enhance intensified and diversified farming systems with more water efficient, productive and sustainable tree-based options taken up by smallholder farmers, for the supply of products and provision of services.
- Researchers targeting agroforestry systems for smallholder farms have access to and use improved methods of system analysis,

experimentation and support of farmer-level learning, as well as information critical for adjusting research agendas.

- Development programmes for smallholder farmers are better equipped to include diverse agroforestry systems among the intervention choices they consider, and use improved tools and knowledge to make more informed choices on integrating agroforestry into farming systems.
- Smallholder farmers across the tropics maintain and enhance intensified and diversified farming systems with more productive and sustainable tree-based options for the supply of products for local use and markets, and the provision of local services.

### **Outcome-to-impact**

These outcomes are expected to contribute to a transformation of lives and landscapes through widespread adoption of agroforestry systems that increase farm level productivity and household incomes, enhance food security and water productivity, and protect the environment.

### **Conditioning factors**

Increasing agricultural productivity (and its general lack of increase) for food security and increased income for a smallholder farmers are conditioned by the location-dependent combination of the following factors:

- Lack of cultural and social values on the cultivation of trees that lead to poor adoption of tree-based options.
- Obsolete national policies, natural resource (and especially 'forest') management laws related to land and tree access and tenure that do not support management of trees on farm, need little investment by farmers and entrepreneurs on-farms while unsustainable exploitation of tree resources from natural ecosystems persists.
- Poorly organized markets for tree products leading to loss of income for producers, spoilt tree products, restricted choice for consumers and non integration of environmental costs of the exploitation of resources
- Poorly equipped and trained extension services leading to poor adoption of agroforestry technologies on-farm and promotion of outdated perceptions of agroforestry.
- Scientific difficulties of deriving principles from complex ecological systems.
- Periodic increase in price of well-established commodities (such as rubber, cacao, cashew nut and oil palm) leading to development and

adoption of intensive monocultures that often compete with diversified systems adopted by smallholder farmers in developing countries.

These conditioning factors point towards an integrated systems approach to the enhancement of diversified and intensified agroforestry systems, because 'lack of knowledge' at the level of the farmer and the various support and governance systems interacts to maintain status quo, and the most strategic entry points for change and improvement differ between contexts and locations.

### **Centre partnerships and capacity strengthening**

The World Agroforestry has a number of partnerships in the area of Tree Intensification and Diversification on-farm. They include, but not exclusively, the following major funded cooperation projects:

- ACIAR-Teak and related projects on smallholder timber in SE Asia – Collaborative research with CIFOR and national partners in Indonesia
- Sustainable Agriculture and Natural Resources Management –Collaborative Research Support Project (SANREM-CRSP), Philippines.
- IFAD funded 'Growing out of poverty – Tree cultivation in West and Central Africa for home use and markets' project, Cameroon.
- Domestication of *Allanblackia* in Cameroon, Ghana, Nigeria and Tanzania supported by Unilever, Austria and GTZ.
- IFAD-supported 'Programme for strengthening livelihood strategies in the West African Sahel through improved management and utilization of parkland agroforests', TAG 799, WCA/Sahel..
- EU-supported 'Sahelian Fruit Trees' – SAFRUIT through the Faculty of Life Sciences, the University of Copenhagen, Denmark.
- 'Food for Progress' project in Cameroon funded by USAID.
- IFAD-supported 'Smallholder Conservation Agriculture Promotion (SCAP) in Western and Central Africa' project.
- Norway-funded "Development of Prototypes for eco-farms in Mali (ECOFERM) project, Mali
- BMZ-supported TUL-SEA project in SE Asia, especially where it supports the further application and use of the WaNuLCAS model for water, nutrient and light capture in agroforestry systems, as well as the SExI-FS, spatially explicit individual based forest simulator.
- A recently completed CFC project on smallholder rubber agroforestry systems in Indonesia and Thailand and the likely follow-on activities.

- CAFNET project on coffee-agroforestry systems in Eastern Africa.

### **Target ecoregions**

GP3 work is applicable to all tropical regions where the Centre is working, but the priority regions are:

#### **1. In sub-Saharan Africa**

RAEZ1 Warm arid and semi-arid tropics: West Africa (Burkina Faso, Guinea, Mali, Niger, Nigeria and Senegal)

RAEZ 2 Warm sub-humid tropics: East Africa (Kenya, Uganda); Southern Africa (Malawi)

RAEZ 3 Warm humid tropics: Cameroon, DR Congo, Ethiopia, Kenya, and Rwanda.

RAEZ 4 Cool tropics: Burundi, Lesotho, Rwanda, and parts of Angola, Ethiopia, Kenya, Madagascar and Tanzania.

#### **2. In Asia and the Pacific**

RAEZ 8 Warm arid and semi-arid tropics (AEZ1): India.

RAEZ 9 Warm sub-humid tropics (AEZ2): India and Nepal and Sri Lanka

RAEZ 10 Warm humid tropics (AEZ3): Laos, Indonesia, Thailand, Philippines, Vietnam and SW China

### **Beneficiaries and end users**

The ultimate beneficiaries are smallholder farmers who will benefit from the wider experimentation, testing and dissemination of a more complete range of agroforestry-based farm management practices that will raise productivity, generate income and protect the environment on-farms and in tropical landscapes. Other end users include national research institutions, development agencies, extension agents, inter-governmental bodies involved in rural poverty alleviation, international research institutions, local and national policymakers, on-governmental organizations.

### **Centre's roles**

The World Agroforestry Centre works with various partners and actors. The Centre's role is the generation of knowledge, research provider and facilitator.

## **Research approach to develop International Public Goods (IPGs)**

### **Advantage of project for generating IPGs**

This Global Project will focus mostly on

understanding the constraints and opportunities at the scale of major farming systems, as opposed to individual farms, to be able to set priority research areas in the development of productive agroforestry systems for smallholders. The World Agroforestry Centre is well placed to deliver IPGs based on its experience in analyzing lessons learned on systems, strategies, approaches and methods for increasing agricultural productivity.

### **IPG nature of outputs**

This global project will focus on developing principles and strategies for improving farming systems through tree diversification and intensification, and on identifying the attributes of species that can play useful functional roles while protecting the environment on-farm. It will also invest in the development of tools, databases, simulation models, guidelines, maps, practices and materials that regional, national and local researchers and development practitioners can use to help identify agroforestry solutions appropriate to their respective conditions. Moreover, the information on the management, water use and productivity of various exotic and indigenous tree species occurring on-farm in various tropical sites have a critical IPG value as diverse natural and traditional farming systems are increasingly replaced by monoculture systems in many agricultural systems.

### **Additional roles beyond research**

Beyond research, this global project will advocate national policies that facilitate the adoption and adaptation of new and integrative approaches. The global project will also be involved in building the capacity of scientists from key institutions on research approaches, methods and principles of agroforestry. The public will also be better informed about tradeoffs, costs and risks and synergies between economical and environmental benefits of growing different mixtures of tree species within farming systems.

## **Elaboration of Partners' Roles**

### **List of major collaborators**

- CG Centres: ICRISAT, IITA, CIFOR, ILRI, Bioversity International, CIAT & ARIS: CIRAD
- Other centres: ICIPE
- Universities: University of Hohenheim (Germany); Ghent University (tree diversity on farm); University of Copenhagen (Fruit trees on farm in WCA/Sahel), Bogor Agricultural University, Indonesia; University of Malawi.

- NARS representing national Agriculture, Forestry and Livestock research
- Local government (Southeast Asia) and NGOs.

### ***Strategic roles of different partners***

The project will collaborate with the above key institutions based on their respective expertise and their contribution to project outputs. ICRISAT's expertise in improved water productivity and diversifying agriculture into high-value crops in the dry lands would help the project develop the best strategies for diversified farming systems. Collaboration with IITA's Department of Farming Systems can help in developing methods and tools for creating greater system resilience and alternatives for income generation within smallholder farming systems.

Biodiversity International's expertise on methods of assessing and in-situ conservation of the agrobiodiversity can help in developing strategies of tree genetic conservation on small farms within diversified farming systems. CIRAD with their experience on some tree-based farming systems such as coffee, cocoa and palm oil would facilitate analyzing the potential to integrate agroforestry in smallholder high-value tree crop systems, and assess various values and tradeoffs of such systems.

Other collaborations include with CIAT could be on agroforestry systems for improved food security in southern Africa, ILRI on integrating fodder trees and shrubs into livestock systems, particularly on farm level, and ICIPE on developing principles, models and frameworks for pest risk assessment and management on-farms.

The Centre intends to work with the University of Copenhagen and its partners to conduct research on various aspects on the adoption and the impact of integrating indigenous fruit trees on small farms. Other institutions such as the University of Hohenheim (Germany), the University of Malawi and Ghent University will be involved in assessing tree diversity on-farm and on the adoption and impact of integrating indigenous fruit trees on small farms. The Coffee Network (CAFNET) will also get involved in the assessment of coffee-agroforestry systems in East Africa.

Local governments and NGOs will facilitate action research and extension of new technologies to farmers and field workers, and policy and decision makers.

### ***SWP collaboration***

The project will collaborate with the African Highlands Initiative and ASB Partnership for the Tropical Forest Margins to evaluate impacts and tradeoffs of farming systems. GP3 will also work closely with Programme 4 'Poverty alleviation and

sustainable management of water, land and forest resources of the CGIAR MTP for West and Central Africa.

## **Global Project 4: Tree Product Markets**

### **Rationale**

#### ***Goal***

To increase small-scale farmer and entrepreneur benefits in agroforestry tree product and service value chains by improving their marketing systems.

#### ***Project objectives***

1. To assess constraints and opportunities facing smallholder farmers and other stakeholders e.g., small scale entrepreneurs and private companies, in key agroforestry tree product value chains;
2. To test policies, technologies, and institutional innovations aimed at improving the functioning of markets for agroforestry tree products and the performance of small tree product enterprises so as to improve the livelihoods of smallholder farmers and other poor participants in value chains
3. To build the capacity of participants in value chains to implement marketing initiatives that benefit smallholders, especially those stakeholders representing and training smallholder farmers and other poor participants.

#### ***Problem Diagnoses and Opportunities***

There is considerable evidence throughout the developing world that smallholder farmers can improve their livelihoods increased participation in agroforestry tree-product value chains. There are many different ways farmers can increase their participation. These include by adding value to raw products by processing, collectively selling their farm produce, targeting new markets, or by differentiating products through quality improvements (for instance, specialty coffee) or by certification to ensure products meet social or ecological standards (ecocertification or fair trade). Farmers benefit from such activities not only in terms of higher incomes, but also through increased food security, employment and greater enterprise diversification, which reduces risk. However, several constraints limit farmers from participating in value chains, such as:

- Lack of information about market opportunities
- Lack of information and capital and limited skills about how to produce and transform products to meet market opportunities
- Lack of organizational capacity to successfully market products

- Local and national policies that discourage farmers from participating in markets (for instance, charcoal production is often illegal) or fail to regulate trade where needed (as in the case of herbal medicines).
- Lack of functioning tree seed and seedlings markets, which are constrained by government policies (e.g. licensing regulations), lack of information — such as that on how to propagate a species— and NGO policies (for instance, distribution of free seed discourages farmers from marketing seed).
- Lack of institutional support for marketing, including credit facilities, market information systems, research, input supply networks, and poor infrastructure, such as transport and storage.
- Insecure land tenure may constrain farmers from producing long-term gestation agroforestry products such as farm timber
- Constrained capacity to produce enough products (of quality and quantity) to meet buyers' demand for sufficiently long periods as required in producing fruits for supermarket demand locally or for export, for instance.
- High cost of certification limits producers' ability to get higher product prices for organic and fair-trade standards.
- Lack of markets that would compensate farmers for ecologically beneficial production. Consumers are often willing to pay a premium for such produce but the market fails to offer them this choice.
- A host problems that generally limit agricultural productivity, including population pressure, land degradation, poor rainfall, pests and diseases, and lack of cash for purchasing inputs.

Market analysis is essential for agroforestry to play a significant role in improving livelihoods. Prioritization of products and zones of action requires analysis of key market factors such as consumer demand, market chains, infrastructure, competition and investment channels. Market analysis should begin by assessing the demand for products by consumers and other buyers along the value chain. Sound analysis of benefits and risks to different categories of people (gender, poor, chronically ill, marginalized, youth) is necessary to ensure market interventions are pro-poor and pro-business.

Analysis of land and resource use and tenure systems (*de facto* and *de jure*) is also essential to understand how benefits to individuals and groups relate to land management. Markets for tree products may endanger natural woodlands or forests if tenure systems at landscape scale are not addressed. There is also a

need to understand who are likely to be the winners and losers as cultivation and commercialization advance. For example, those harvesting tree products from the wild may suffer if cultivation provides the products at lower cost.

Private-public partnerships are needed for developing enterprise models that improve livelihoods of small farmers and provide adequate returns to private companies. Helping farmers to develop products that meet consumers' social and ecological standards (such as fair trade or eco-certification) have a huge potential for improving prices of tree products and producers' incomes. Innovative marketing is needed to link farmers producing ecologically beneficial products with consumers willing to pay a premium for such products.

### ***Links to CGIAR System priorities***

Project objectives align well with CGIAR System Priorities. Output 4.1 will help to identify opportunities and constraints relating to technologies, policies and institutional innovations to increase smallholder incomes from fruits (Priority **3A**) and for promoting sustainable income generation from trees (Priority **3D**). This output will also help to make markets work for the poor (Priority **5B**) and improve options to reduce rural poverty and vulnerability (Priority **5D**). Assessing constraints and opportunities will focus on the poor, who are often marginalized by market-based initiatives.

Output 4.2 on best practices and innovations for improving smallholder access to markets will also contribute to increasing incomes from fruits and trees (Priority **3A** and **3D**). Because the focus in this output is on poor smallholders, the results will help make markets work for the poor and will help reduce poverty and vulnerability (Priority **5B** and **5D**). Helping the poor receive compensation for the ecological services they provide will be an important priority in the Centre's eco-certification efforts. Capacity enhancement (Output 3) for the poor and those institutions helping them are also critical for ensuring that markets work for the poor.

### ***Alterations in project composition and outputs***

This project description draws on the former Project TM3 (Marketing of Agroforestry Tree Products) in the previous MTP. It also adds a new focus on markets for environmental services, which have recently emerged partly due to the efforts of previous projects ES2 (Climate Change) and ES3 (Environment policy). As pointed out in the problem diagnoses, this addition is in response to growing opportunities for smallholders to participate in carbon markets in developed countries as well as local markets for environmental services in their own regions. These markets allow

farmers to receive compensation for planting trees that sequester carbon and provide other services such as watershed protection and soil erosion control. This project therefore cross-links strongly with GP7

(on tools and methods for carbon measurement and monitoring) and GP8 (on policy options for enhancing smallholder access to carbon markets).

## Description of Impact Pathways

The *output-outcome-impact* pathway for GP4 is summarised as follows:

Outputs	Outcomes	Impacts
G.P 4.1 Understanding of constraints and opportunities of agroforestry tree product market chains	Better targeting of improved practices, institutional innovations, and policies.	Higher returns and reduced risk for poor farmers, women and vulnerable groups
G.P 4.2 Best practices and institutional innovations for improving smallholder access to markets	Adoption of best marketing practices and innovations by a wide range of partners reduces transaction costs and results in more effective and efficient value chains	
G.P 4.3 Capacity enhancement for improved smallholder tree product market chains	Better functioning of agroforestry tree product and service markets	

### Conditioning factors

Policy and institutional factors play a critical role in ensuring the success of outcomes and achievement of impact. Donor and national policies promoting the marketing of agroforestry tree products need to be maintained and strengthened. Substantial amounts of donor funds are needed to facilitate market development. In most developed countries, farmers are paid to plant trees. Such subsidies are needed for developing countries as well. Policies at the national and global level, such as the Clean Development Mechanism of the Kyoto Protocol, are needed to ensure that global markets function and smallholders have access to them.

Many trends are also affecting the demand for agroforestry tree products. Urbanization and rising per capita incomes will continue to increase demand for many agroforestry tree products such as fruits, timber for construction and fodder. However, the increased focus on large-scale plantations in Africa and to some extent in Asia is an important threat to smallholder access to tree product markets.

### Centre partnerships and capacity strengthening

The project will also strengthen partnerships with the private sector. Existing partnerships with Unilever, Mars and Syngenta will be enhanced to help smallholder farmers access markets, diversify incomes and improve their livelihoods. The recently launched tree products platform, Naturally African, is a good example of initiatives in this area. The pan-African platform will function as an information and resource centre linking

key stakeholders participating in value chains of numerous tree product enterprises to improve incomes of rural producers.

The Centre will also strengthen partnerships with

- FAO and CIFOR in approaches to marketing tree products, particularly in humid tropics of west and central Africa.
- Care International's Poverty and Environment Network, particularly in the area of wood marketing
- Corporate Council on Africa, a US-based association of private corporations interested in linking US-based agribusiness and African rural producers.

Capacity strengthening will also benefit key stakeholders in value chains, including: NARS and policy makers facilitating the development of marketing chains, and stakeholders representing and training smallholder farmers and other poor community members.

### Target ecoregions

#### 1. In sub-Saharan Africa

RAEZ1 Warm arid and semi-arid tropics (AEZ 1): West Africa (Mali, Niger, Senegal, Burkina Faso); East Africa (Ethiopia, Kenya, Tanzania); Southern Africa (Malawi, and Zimbabwe).

RAEZ 2 Warm subhumid tropics (AEZ 2): East Africa (Uganda, Kenya, Rwanda, Tanzania); Southern Africa (Malawi and Zimbabwe).

RAEZ 3 Warm humid tropics (AEZ 3): Cameroon, DR Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Ghana, Nigeria. Congo, Guinea

## **2. In Asia and the Pacific**

RAEZ 8 Warm arid and semi-arid tropics (AEZ 1): India and Thailand.

RAEZ 9 Warm subhumid tropics (AEZ 2): India, Sri Lanka and Thailand.

RAEZ 10 Warm humid tropics (AEZ 3): Bangladesh, Indonesia, Laos, Philippines, Sri Lanka and Thailand.

### ***Beneficiaries and end users***

The primary beneficiaries outside of World Agroforestry Centre scientists are government, NGOs and private sector entities seeking to promote smallholder participation in markets for agroforestry products and services. Within the Centre, this project will link strongly with and contribute to GP2 (to help farmers exploit market opportunities); GP1 (in assessing the impacts); GP8 (on policy constraints); and GP7 (on improving smallholders access to carbon markets).

Other end users of the market and tree product knowledge and innovations produced by the project include: certification bodies, community based organisations, development agencies, extension agents, farmers, producer associations, inter-governmental bodies involved in trade, International Product Research Institutions, local policymakers, National policymakers, National Product Research Institutions, Universities and other educational institutions, regional bodies involved in trade, and marketers.

### ***Centre's roles***

The World Agroforestry will contribute to improving the functioning of markets to benefit the rural poor through generating knowledge and methods, convening stakeholders' forums, building networks and disseminating decision-support tools and training materials. This is also linked to other roles in the other Global Projects such as impact assessment methods (GP1), agroforestry species and practices that help farmers take advantage of market opportunities (GP2), and methods for policy options (GP8).

## **Research approach to develop International Public Goods (IPGs)**

### ***Advantage of project for generating IPGs***

The project has several strengths that will facilitate the development of valuable International Public Goods. Project members are drawn from a wide range of disciplines and backgrounds, including

agroforestry, agricultural economics, marketing and extension. The members are working in a wide range of agroforestry practices and environments across the tropics in collaboration with a broad range of partners, including the private sector, NARS, CGIAR centres and policy makers.

### ***IPG nature of outputs***

Market knowledge generated includes information on prices, actors, volumes, timing, margins and profitability. It also encompasses analysis of opportunities for market expansion, collective marketing and formation of producer associations. This knowledge base itself is an IPG that can be used by current or potential participants in agroforestry product markets.

Some other key international public goods to be produced by the project include

- Models for public-private partnerships
- Decision-support tool for planning and promoting market-based seed production and distribution systems
- Approaches for linking smallholder farmer to markets for environmental services
- Diagnostic and analytical tools for identifying market opportunities and assessing the performance of agroforestry tree product value chains.

### ***Additional roles beyond research***

'Action research': assisting small-scale seed vendors and nursery operators to form associations so as to assess the advantages and disadvantages of such associations and generate lessons (IPGs) that can be applied in promoting them.

Capacity building: Conducting training courses and developing training curricula helps in disseminating best practices and assuring that lessons and IPGs reach a wide range of partners as well as to teachers and students in educational institutions.

Development-support: Facilitating the dissemination and use of training materials and decision-support tools by beneficiaries and end users.

## **Elaboration of Partners' Roles**

### ***List of major collaborators and strategic roles of different partners***

CG Centres: CIAT, IFPRI, ICRISAT

Others: Commercial Products from the Wild (CPWild), University of California, Berkeley.

Other partnerships and cross linkages that need to be developed include with Naturally Africa, the Corporate Council on Africa and the private sector.

## Role of Partners

Name of Partner <i>* New partners</i>	What they will do	Output	Geographical scope
CIAT	Assist in assessing constraints and opportunities for smallholder agroforestry tree enterprise development.	GP 4.1, 4.2, and 4.3	East and southern Africa
IFPRI	Policy research and how to improve market performance	GP4.1 and 4.2	Global
ICRISAT	Provide expertise in smallholder seed systems to develop best practices for tree nurseries and smallholder production and distribution systems for seed and seedlings.	GP 4.2	East and southern Africa;
Commercial Products from the Wild, University of California at Berkeley	Provide critical expertise in an area where we have limited capacity. The business development perspective is critical in developing IPGs concerning enterprise models, public-private partnerships and models for sustainable seed production and distribution systems.	GP4.1 and 2	East and southern Africa
Hannover University, Germany, Ethiopia Institute of Agricultural Research,* and Kenya Agricultural Research Institute, East and Central African Programme for Agricultural Policy Analysis (ECAPAPA), Department of Agricultural Research (Malawi)	Market analysis to assess fruit marketing opportunities	GP 4.1, 4.2, and 4.3	Kenya, Ethiopia, Malawi
FAO, Department of Forestry Policy and Institutions Service (FONP)	Approaches to marketing analysis and development	GP 4.1 and 4.2	West Africa
Care International's Poverty and Environment Network*	Feasibility and promotion of timber marketing	GP 4.1 and 4.2	East Africa
Food, Agriculture and Natural Resources Policy Analysis Network in Southern Africa*	Assessment of policy constraints to fruit marketing	GP4.1	Southern Africa
Kunming Institute of Botany, Yunnan (China),	Chemical analyses of shea product samples in order to establish a certification system based on origin.	GP4.2	West Africa, China
FAO, Inter-Governmental Group on Oilseeds, Oilseeds and Fats (FIGGOOF)	Technical oversight in establishment of certification system for shea products	GP4.2	West Africa

## SWP collaborations

This project will link with the Alliance Centre of the CGIAR involved in Flagship 2 of the Eastern and Southern Africa Regional Collective Action Plan, which has a focal area on linking smallholder farmers to markets.

# Global Project 5: Agroforestry in multifunctional landscapes: Tradeoffs and Synergies

## Rationale

### Goal

Local resource managers in multi-use landscapes with trees routinely use cost-effective, replicable tools and approaches to appraise the likely impacts of changes in land use on watershed functions, biodiversity and carbon stocks, as well as on economic productivity of the landscape

### Project objectives

1. To obtain empirical data, understand and synthesize process-based models of ecological and economic tradeoffs between 'goods' (for subsistence and markets) and 'services' (carbon stocks, biodiversity indicators and quantifiable watershed functions) obtained from multifunctional landscapes with trees, compared with those without.
2. To construct and test rapid appraisal tools that allow for location-specific integrated natural resource management solutions with diversified agroforestry systems in complex landscapes with multi-stakeholder negotiation processes.
3. To support multiple ways of learning from landscape scale experiments with modification of incentive systems for enhancing the role of multifunctional agroforestry systems.

### Problem diagnoses

Trees use water while storing carbon; they replace natural forest while reducing poverty. Market-oriented monocultures compete with risk-averse poly-cultures, trading off income and risk. Plantations displace smallholders, trading off local rights and income opportunities, while; national reforestation programmes use public resources, promising an increase in environmental services that may not happen. Trees in all these examples are closely linked to 'tradeoffs' and 'conflict', exaggerated expectations and disappointment.

Integrated natural resource management (INRM) requires site-specific understanding of tradeoffs and synergies between and among the *goods* and *services* that trees in agro-ecosystems can provide. It is thus more complex when compared to simpler, readily scalable *green-revolution* technologies. Replicable, cost-effective approaches are needed in the hands of local professionals with interdisciplinary skills to help stakeholders sort out positive and negative effects of trees in multi-use landscapes ('agroforestry') on

livelihoods, water and (agro-) biodiversity, associated rights and rewards, and, ultimately, on the Millennium Development Goals (reducing poverty, promoting equitable forms of globalization, building peace).

Research from different parts of the tropical world has shown that multifunctional agroforestry systems such as shade coffee or cocoa and jungle rubber are viable alternative land-use practices. It has been demonstrated that such alternative land-use can deliver livelihood benefits while maintaining and enhancing ecosystem function, including its scope for resilience. As a result, such systems are becoming increasingly valuable in landscape management approaches to biodiversity conservation and watershed management. More recently, they are gaining recognition as potential targets for avoided deforestation strategies in climate change mitigation.

Making the most of agroforestry and other tree-based systems, however, requires good information about the ecosystem service values of various systems and practices, the inevitable tradeoffs among those services, and incentives that farmers have to invest in agroforestry systems, protect other tree-based systems and engage in tree product enterprises. This information will help reinforce the potential importance of multifunctional agroforestry systems in degradation avoidance and maintaining ecosystem services.

The World Agroforestry Centre has developed a *negotiation-support* approach for reducing conflict in multi-use landscapes (see also GP8). The approach aims to bridge perception gaps among stakeholders (within their local, public/policy and scientific knowledge paradigms) and increase recognition and respect for different knowledge systems. The approach also helps quantify tradeoffs between economic and environmental impacts at landscape scale, and allows for joint analysis of plausible scenarios. Building on the achievements of participatory rural appraisal, we can now add quantitative strengths with the *toolbox for tradeoff analysis*.

This global project builds upon and refocuses the Centre's experience with previous projects on landscape interactions, including the role of agroforestry in watershed services and providing habitats for biodiversity conservation. This project also provides the institutional home for the joint Biodiversity Platform of CIFOR and the World Agroforestry Centre. Landscape-scale research will be coordinated across the forest-agriculture spectrum. It will mainly focus on the effects of managed forests, forest remnants, plantations and agroforests on biodiversity and livelihoods.

This project presents opportunities for truly interdisciplinary collaboration with many local, regional and international partners and initiatives,

including the Global Partnership for Forest Landscape Restoration. The joint Biodiversity Platform, in particular, will promote dialogue and networking to catalyse the development of new thinking, approaches, and practice of biodiversity conservation and sustainable use in multifunctional landscapes. It will provide opportunities for sharing of lessons, especially across disciplines, sites and scales; synergies, for instance of resources, skills, mandates; and added value, through syntheses and generalization, among other areas.

### **Links to CGIAR System priorities**

GP5 matches closely with System priority **4A** (Integrated land water and forest management at landscape level), but also contributes to two other System Priorities **4D** (Agricultural intensification in low/high potential areas) and **3D** (Sustainable income from forests and trees).

### **Alterations in project composition and outputs**

This project builds on the achievements of a number of projects in the World Agroforestry Centre's MTP 2007-2009: ES1.2 (Biodiversity conservation), ES1.1 (Watershed management), ES1.3 (Trees in multifunctional landscapes). It is also closely integrated with GP3 on the plot or farm level and GP8 on the institutional side, by incorporating elements of ES3.1 (Harmonising policy for environment and poverty goals), ES3.2 (Rewards for Environmental Services), LP2.3 (Improved water productivity) and TM1.3 (On-farm management of tree genetic diversity).

## **Description of Impact Pathways**

### **Output-outcome-impact pathway**

This GP has the following three Outputs:

- GP5.1 Dynamic tradeoff models developed (based on empirical studies) for 'goods' (for subsistence and markets) and 'services' (carbon stocks, biodiversity indicators and quantifiable watershed functions) from multifunctional landscapes with trees.
- GP5.2 Rapid appraisal tools for biodiversity, watershed functions and carbon stocks at landscape scale produced that support multi-stakeholder dialogue on options for increase or change in the tree presence and (agro)forest cover in the landscape.
- GP5.3 Learning landscapes established (and IPGs derived from them) with long-term analysis of change and experiments with modification of incentive systems for enhancing the role of

multifunctional agroforestry systems in avoided deforestation for climate change mitigation, watershed protection and biodiversity conservation.

### **Output-to-outcome**

Follow through consists of active engagement in capacity building through universities, NGOs and local government agencies, to support them in the development of appropriate training methods and materials. The intended outcome is our project goal: "Local resource managers in multi-use landscapes with trees use cost-effective, replicable tools and approaches to appraise the likely impacts of changes in land use on watershed functions, biodiversity and carbon stocks, as well as economic productivity of the landscape "

### **Outcome-to-impact**

This outcome is expected to contribute to the overall impact of the World Agroforestry Centre's role of improving lives and landscapes, through more knowledge-based negotiations of changes in landscape mosaics and incentive structures.

### **Conditioning factors**

In the broad context processes of 'negotiation support' in multi-use landscapes as developed by the World Agroforestry Centre and partners, a number of conditioning factors have to be recognized before the outputs and outcomes can be achieved:

- Explicit recognition of *multiple perceptions* and *knowledge systems* of various stakeholders that informs *tradeoff* analysis across the interests involved,
- Biodiversity conservation *within* landscapes with 'domesticated forests' or complex agroforests,
- Upland-lowland negotiations to produce rules and reward mechanisms for watershed functions, that are based on *site-specific evidence* rather than *perceptions* alone,
- Improved local and national level appreciation of the role of *diversity and identity* of uplands in supporting niche market opportunities and site-specific development pathways rather than being an obstacle to 'standardized' development.

### **Centre partnerships and capacity strengthening**

A number of major funded cooperation projects contribute to GP5. These include:

- An SDC-supported CIFOR-World Agroforestry Centre project "Integrating Livelihoods and Multiple Biodiversity Values in Landscape Mosaics"

- BMZ-supported project “Trees in multi-use Landscapes in Southeast Asia (TUL-SEA): A negotiation support toolbox for Integrated Natural Resource Management”, co-implemented with the University of Hohenheim (Germany) and national partners in five SE Asian countries,
- The EU ProEco-supported “Rebuilding Green Infrastructure for Aceh and Nias with Trees Farmers Want” (ReGrIn), also co-implemented with the University of Hohenheim (Germany) and national partners in Indonesia
- A EU-CIRAD CAFNET (CRAD-696) project on environmental services of coffee in East Africa and certification (cross-linked to GP4).
- The IFAD supported PRESA project in East Africa (cross-linked to GP8).
- The IFAD supported TAG 799 (World Agroforestry Centre’s WCA/Sahel Region).
- IUCN-supported activities in the landscape mosaic surrounding Mt Elgon (Kenya/Uganda).
- The MARS Inc INAFORESTA cocoa agroforestry project.

A second phase of the IFAD-supported RUPES project (Rewarding Upland Poor for the Environmental Services they provide) is expected to start 2008. Specific links to capacity strengthening exist in SE Asia though a sub-project of the SIDA-supported Southeast Asia Network for Agroforestry Education (SEANAPE).

### **Target ecoregions**

This Global Project is applicable to all regions where the Centre works, but the priority regions with currently funded or pipeline project activities are as follows:

#### **1. In sub-Saharan Africa**

RAEZ 1 Warm arid and semi-arid tropics: West Africa (Mali, Burkina Faso); East Africa: Kenya, Tanzania); Southern Africa (Malawi, Mozambique, Zambia)

RAEZ 2 Warm subhumid tropics: East Africa (Uganda); Southern Africa (Malawi, Zambia)

RAEZ 3 Warm humid tropics: Cameroon, Ghana

#### **2. In Asia and the Pacific**

RAEZ 8 Warm arid and semi-arid tropics: India and Thailand.

RAEZ 9 Warm subhumid tropics: India, Nepal, Laos, Vietnam and Thailand.

RAEZ 10 Warm humid tropics: Indonesia, Philippines, Sri Lanka.

RAEZ 11 Warm arid and semi-arid subtropics with summer rainfall: China

### **3. In Latin America and the Caribbean**

RAEZ 17 Warm humid tropics: Brazil, Peru.

#### **Beneficiaries and end users**

Rural and forest margin landscapes have multiple stakeholders: the people who live and farm in the landscape, downstream users of the waterflows from the landscape, those who appreciate the biodiversity maintained within the agricultural landscape and those who work in industries that process products produced in the landscape. All these stakeholders can benefit from more rational and organized negotiations of future pathways at landscape scale, including the role of trees and forest areas. If incentive structures are effectively adjusted to the balance of goods and services that can be generated, rural people (whether farmers or not) can benefit through enhanced provision of local services, increased recognition and respect in public for a, and higher incomes.

End users of the project outputs are primarily local governments and participants in public initiatives advocating and an increase in tree and forest cover as well as protection of existing forest and agroforest. The tools are designed to be replicated at reasonable cost, with support from public databases and simulation models.

#### **Centre’s roles**

In this project, a number of different scientific traditions come together. One is the analytical or empirical approach that explores the spatial and temporal aspects of the lateral flows of water, soil, nutrients, organisms and fire across a landscape mosaic, depending on and shaping its spatial configuration. Another is a synthetic, process-based modelling approach that combines conceptualizing of key processes with appropriate spatial patterns. There is also the spatial analysis approach of multilayered GIS that describes and analyzes patterns as such, and derives ‘typologies’.

Other traditions are based on local ecological knowledge and ways of learning of the long-term inhabitants of the landscape, the public knowledge and logical constructs used for policy development, and the formal representation of both local and public, policy makers’ knowledge.

The World Agroforestry Centre’s primary role is to work at the crossroads of these traditions, with specialists in the various approaches who may have a university, government research or NGO affiliation, and to distill simplified approaches that do justice to the richness of multiple ways of knowing and that can be effectively communicated in fora that bring together different stakeholders.

## Research approach to develop International Public Goods (IPGs)

### *Advantage of project for generating IPGs*

The World Agroforestry Centre has more than a decade of experience in working with and learning from a series of 'benchmark areas' in the tropical forest margins, where biophysical and socio-economic research was integrated. Started under the ASB framework, a number of the Southeast Asian benchmark areas were involved in the innovative RUPES network. The initiative has now generated substantial experience and data that can be shared with stakeholders in similar landscapes as IPGs on effective landscape management. A string of publications, simulation models, rapid appraisal guidelines and quantitative indicators of watershed functions has been generated at these sites and is ready for widespread dissemination in the coming years.

The approaches pioneered in Thailand and Indonesia under the ASB umbrella (GP11) are spreading to other countries in Asia as well as in East Africa. In the formation of this new Global Project, more direct links with activities in West and Central Africa will become visible.

The capacity of World Agroforestry Centre staff to generate IPGs on agroforestry in multifunctional landscapes exists in four 'expertise groups': a) The staff directly associated with the CIFOR-World Agroforestry Centre Biodiversity Platform; b) The expertise group on 'Water flows and watershed functions in landscapes with trees'; c) The expertise group on 'Landscape patterns, multifunctionality and goods/service tradeoffs'; d) The expertise group on 'Learning landscapes: avoided deforestation with sustainable benefits (ADSB)', linked with ASB, PRESA and RUPES.

### *IPG nature of outputs*

- GP5.1 Dynamic tradeoff models developed (based on empirical studies) for 'goods' (for subsistence and markets) and 'services' (carbon stocks, biodiversity indicators and quantifiable watershed functions) from multifunctional landscapes with trees
- GP5.2 Rapid appraisal tools produced for biodiversity, watershed functions and carbon stocks at landscape scale that support multi-stakeholder dialogue on options for increase or change in the tree presence and (agro) forest cover in the landscape
- GP5.3 Learning landscapes established (and IPGs derived from them) with long term analysis of change and experiments with modification

of incentive systems for enhancing the role of multifunctional agroforestry systems in avoided deforestation for climate change mitigation, watershed protection and biodiversity conservation

### *Additional roles beyond research*

Expertise groups on (agro) biodiversity, the roles of trees in watershed functions and the integration of local ecological and formal scientific knowledge of landscape relations have advisory roles in their local work context as well as globally. The project is associated with the DIVERSITAS Agrobiodiversity global research plans and provides landscape ecological backstopping for the policy oriented activities in GP8.

## Elaboration of Partners' Roles

### *List of Partners*

#### **CGIAR Centres: CIFOR, Bioversity**

NARS: FORDA, Indonesia; Indonesian Soil Research Institute; Indonesian Tree Crop Research and Development Institute

Universities: University of Hohenheim (Germany); Brawijaya University, Indonesia; Chiang Mai University, Thailand; Australian National University; Katholieke Universiteit Leuven, Belgium

NGOs: WARSI, Indonesia; Conservation International, DIVERSITAS Agrobiodiversity

### *Strategic roles of different partners*

Partners in GP5 represent different parts of the science-development spectrum. Accordingly, they have different weights along the steps of the World Agroforestry Quality Management scale. Some partners are especially involved in the framing of issues and agenda setting, while others are full partners in the project cycle of resource mobilization, staff capacity building, method improvement, data gathering and analysis and reporting. Some differentiation occurs at the end of the cycle, where some partners are primarily focused on furthering local application and others on policy influencing.

In line with the nature of the GP5 work, partnerships involve a number of universities, both in our partner countries and those that can invest in our work. A number of stakeholders in specific aspects of the landscape mosaic, either in the water or biodiversity aspects, are partners in GP5 work. The partnership list reflects the fact that so far, GP5 is most advanced in SE Asia.

Name of Partner	What they will do	Output	Geographical scope
CIFOR	Strengthen the forest side of the landscape mosaic analysis	GP5.1 GP5.3	Global
FORDA, Indonesia	Provide a primary 'user' perspective on dynamic landscapes in Indonesia, and be test group for use of tools, esp. re watershed management	GP5.2	Indonesia
University of Hohenheim (Germany)	Co-develop methods and tool tests in practical settings	GP5.1 GP5.2	SE Asia
Brawijaya University, Indonesia	Co-develop methods and tool tests in practical settings	GP5.2	Indonesia
Chiang Mai University, Thailand	Co-develop of methods and tool tests in practical settings	GP5.2	Thailand
Indonesian Soil Research Institute	Co-develop methods and tradeoff analysis esp. re watershed management	GP5.1 GP5.2	Indonesia
WARSI, NGO, Indonesia	Provide a primary 'user' perspective on dynamic landscapes in Indonesia and be test group for use of tools	GP5.3	Indonesia
Conservation International	Provide a primary 'user' perspective on dynamic landscapes in Indonesia and share research results on the conservation side	GP5.1 GP5.3	Global
Indonesian Tree Crop Research and Development Institute	Provide a primary 'user' perspective on dynamic landscapes in Indonesia, and share research results on the productive use side	GP5.1 GP5.3	Indonesia
DIVERSITAS Agrobiodiversity	Framing of global research issue on biodiversity-productivity tradeoffs dynamic landscape mosaics	GP5.1	Global
Australian National University	Synthesis of watershed research and tool development	GP5.1	SE Asia
Katholieke Universiteit Leuven, Belgium	Synthesis of watershed research and tool development, and follow up applications	GP5.1 GP5.2	SE Asia

### ***SWP collaborations and regional MTP involvement***

ASB-Partnership for the Tropical Forest Margins as elaborated in GP11.

## **Global Project 6: Agroforestry for Land Rehabilitation**

### **Rationale**

#### ***Project Goal***

Sustainable land management is widely practised through better problem analysis, targeting and use of appropriate agroforestry options.

#### ***Project objectives***

To provide governments, land resource managers and other stakeholders with the knowledge base and decision -support tools for assessing and tackling land degradation through agroforestry.

### ***Problem diagnoses***

Land degradation is an important problem in many tropical developing countries that is undermining development efforts to increase agricultural productivity and foster environmental sustainability. Land degradation in drylands (desertification) is of particular concern because it mostly affects vulnerable populations.

Furthermore, land and soil degradation have serious consequences for other natural resources upon which development depends. For example, degradation of water quality in surface waters due to increased sediment loads affects fisheries and the quality of water sources for humans and animals, which in turn affects human health.

Governments, donors and development organizations need scientifically credible evidence to make informed decisions on which interventions can be implemented where to prevent further land

degradation and rehabilitate degraded lands. There is considerable evidence that agroforestry can provide a viable option for sustainable land management in many situations. Research by the World Agroforestry Centre and others has shown that agroforestry builds assets as well as current cash flows for smallholder farmers and helps to maintain ecosystem services at intermediate intensification levels. Nevertheless, tree cultivation is not a panacea. Interventions must be appropriately targeted to ecological and socioeconomic conditions to have positive impacts. Stakeholders also need operational monitoring tools to assess impacts of interventions on land condition and human wellbeing against baselines and targets.

Preventative actions to avoid further land degradation on relatively intact soils are generally much more cost-effective than rehabilitation following degradation. Agroforestry, integrated soil management practices, and policies to support their widespread adoption, are key strategies to help prevent over-exploitation of vegetation and soil resources, and to keep soil in place, thereby maintaining ecosystem functions such as hydrological regulation. Improving soil productivity and access to tree products in agricultural landscapes can help take pressure off forests and marginal lands. At the landscape level, agroforestry can also help maintain corridors for wildlife and enhance biodiversity in agricultural landscapes. Opportunities for preventative action need to be urgently identified to avoid greater costs in future.

Increasingly, however, lands are already degraded and major rehabilitation is required to restore ecosystem functions. Agroforestry-aided natural rehabilitation (of grazing lands, for instance) is an attractive prospect in such situations. Indeed in poor areas in Africa and South Asia, there is a growing interest in natural rehabilitation of degraded land that is reclaimed by rural communities using a combination of techniques such as water harvesting, manuring and tree planting. On farmlands, agroforestry can be an important component in integrated soil management strategies to improve soil physical structure, enhance water infiltration and build up soil carbon.

To help scale up such activities and improve ecosystem services for the benefit of society, governments and development agencies need operational frameworks that can: (1) provide evidence-based diagnostic information to guide resource allocation; (2) identify cause-and-effect relationships for prevention, early detection and rehabilitation; and (3) monitor outcomes and impact. In addition, there is a need to strengthen empirical knowledge in key agro-ecosystems on land degradation processes and their causes, and performance of agroforestry options.

### ***Links to CGIAR System Priorities***

GP6 matches most closely with CG System Priorities **4A** (Integrated land water and forest management at landscape level) and **4D** (Agricultural intensification in low/high potential areas). Primary contributions to **4A** will be to develop methods and analytical tools for the management of multiple-use landscapes with a focus on sustainable productivity enhancement (Goal 1); and enhance stakeholder capacity for socio-ecological planning at landscape and farm levels (Goal 2). Primary contributions to **4D** will be to improve understanding of degradation thresholds and irreversibility, and the conditions for success in low-productivity areas (Goal 1); identify domains of potential adoption and improvement of technologies for improving soil productivity, preventing degradation, and rehabilitating degraded lands (Goal 3); and improve soil quality to sustain increases in productivity, stability, and environmental services through greater understanding of processes that govern soil quality and trends in soil quality in intensive systems (Goal 5).

### ***Alterations in project composition and outputs***

This project incorporates the main elements of the former project LP1 (Land and soil health) in the previous MTP. Because of the importance of water harvesting for rehabilitation of degraded drylands, the project will also include former Output LP2.3 (Principles and options for more effectively integrating agroforestry with water management at the farm-scale).

### **Description of Impact Pathways**

This Global Project has two major outputs:

- GP6.1 Land and soil degradation assessment methods and empirical results generated
- GP6.2 Decision support tools for targeting agroforestry based land rehabilitation developed and applied

### ***Output-outcome-impact pathway***

Successful rehabilitation of degraded lands will lead to major transformations in lives, through increased agricultural productivity and landscapes as well as by enhancing environmental benefits. Achieving this impact will require two key outcomes: a) Policies and programmes better targeted at key land degradation and soil problems; and b) Improved agroforestry options for land rehabilitation applied and adapted by development organizations. The project will generate these outcomes through generation of land and soil degradation assessment methods and empirical results, and development and application of decision-

support tools for targeting agroforestry based land rehabilitation.

### **Conditioning factors**

The main assumption is that national programmes invest in developing sufficient scientific and technical capacity to be able to adopt new decision-support approaches and tools for improved land management. There is increased interest in addressing land degradation and soil fertility problems in tropical developing countries as an essential component of sustainable development, providing renewed opportunities for scaling up interventions; however, there is a risk that this interest may wane.

### **Centre partnerships and capacity strengthening**

The project will build on well-developed collaboration with TSBF-CIAT in the area of integrated soil fertility management and development of a soil health surveillance system for Africa. The World Agroforestry Centre is co-leading with ICRISAT the assessment component of a pre-proposal for OASIS, a CGIAR Challenge Programme to combat desertification in which nearly all centres are involved. With ICRISAT, this project is already jointly implementing soil health surveillance work in Southern Africa (Mozambique) and East Africa (Kenya) for legume-based cropping systems. The project is also jointly implementing the Desert Margins Programme.

Closer ties will be developed with ILRI on rangeland rehabilitation, while the project will continue to strengthen capacity and collaborate with other centres in land health surveillance methods and agroforestry options for land rehabilitation.

### **Target ecoregions**

Within the agroecological zones below the project will primarily target degraded agro-ecosystems, primarily cultivated land and rangeland. The focus will be refined as part of the development of the project conceptual framework.

#### **1. In sub-Saharan Africa**

RAEZ 1 Warm arid and semi-arid tropics (AEZ 1): West Africa: Mali, Mauritania, Niger, Senegal, and parts of Burkina Faso. East Africa: Parts of Ethiopia, Kenya, Tanzania and Uganda. Southern Africa: Parts of Madagascar, Malawi, Mozambique, and Zambia.

RAEZ 2 Warm subhumid tropics (AEZ 2): Southern Africa: Parts of Malawi, Mozambique and Zambia.

RAEZ 3 Warm humid tropics (AEZ 3): Parts of Kenya and Ethiopia

RAEZ 4 Cool tropics (AEZ 4): Rwanda, and parts of Ethiopia, Kenya, Madagascar and Tanzania.

#### **2. In Asia and the Pacific**

RAEZ 8 Warm arid and semi-arid tropics (AEZ 1): Parts of India.

RAEZ 9 Warm subhumid tropics (AEZ 2): Parts of India.

#### **3. In Latin America and the Caribbean**

RAEZ 17 Warm humid tropics (AEZ 3): Brazil

### **Beneficiaries and end users**

The ultimate beneficiaries are resource-poor land users in tropical developing countries. The project outputs are designed to influence decisions by a range of actors at different scales.

Regional scale: Policy development, priority setting and resource allocation decisions on land and soil management programmes by inter-governmental organizations, UN agencies, donors, non-governmental development agencies, and the private sector.

National scale: Policy development, priority setting and resource allocation decisions on land rehabilitation programmes by governments and development agencies.

Local scale: Design of local extension and development programmes and targeting of land rehabilitation recommendations to farmer communities by government local planners and extension services.

### **Centre's roles**

The World Agroforestry's role in ensuring outcomes and impacts is through the following: (i) Joint application of approaches and methods in large projects with national partners, (ii) capacity building of national programmes through MSc and PhD training, shorter training courses and hands-on training, (iii) dissemination of guidelines and training materials, and (iv) scientific and technical backstopping through advisory services to national programmes.

## **Research approach to develop International Public Goods (IPGs)**

### **Advantage of project for generating IPGs**

The World Agroforestry Centre has developed, and is continuing to improve, a land health surveillance framework for assessing land degradation at multiple scales and targeting intervention options. The 2006 External Programme and Management Review recognized elements of this work, particularly the development of infrared spectroscopy for rapid screening of soil health, as an example of both

achieved and emerging IPGs by. The land health surveillance framework is being used in a UNEP capacity-building project to guide strategies for land restoration in five West African dryland countries and in a World Bank-GEF project in Kenya led by the national agricultural research institute that is designed to tackle land degradation problems in the Lake Victoria basin. Soil health surveillance has been recommended as part of a NEPAD-endorsed strategy for saving Africa's soils and is proposed for sub-Saharan Africa as a component of the Global Digital Soil Map project.

### ***IPG nature of outputs***

A land health surveillance system that is freely available will provide the scientific and factual database essential to informed decision-making and appropriate policy action on agroforestry based land rehabilitation. The land health surveillance system is modeled on surveillance approaches used in public health management. At present, there are no consistent, large-area mechanisms for testing the efficacy of agroforestry and other land management interventions in tropical developing countries.

The project will:

- (i) enable governments to provide practical, timely, and cost-effective information at high-spatial resolution about where specific land degradation processes occur in a given region or country, and how these are changing over time;
- (ii) provide a framework for rigorous scientific testing and implementation of locally relevant rehabilitative soil management interventions, addressing what works where; and
- (iii) provide practical policy and management advice to policy makers, scientists, development specialists and farmers.

The approaches and methods are globally applicable but have greatest potential to accelerate development progress in tropical developing countries, where data on land condition and knowledge on appropriate targeting of land rehabilitation interventions are completely inadequate for the task at hand.

### ***Additional roles beyond research***

The project will play a key role in building capacity of tropical developing countries in modern scientific and technical approaches and tools for land assessment and management, e.g. geoinformatics and associated statistical analysis. Training and capacity building is needed to support a new generation of soil scientists and natural resource management professionals to

ensure that the generated information can be used to improve land management and policy decision-making.

## **Elaboration of Partners' Roles**

### ***List of major collaborators***

The project collaborates with other CGIAR centres and advanced research institutes in the area of land degradation assessment and integrated soil fertility management. These include TSBF-CIAT, ICRISAT, and the Earth Institute at Columbia University, Cornell University, University of Florida, and BioForsk in Norway. The project is also working closely with the United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), the World Bank and NEPAD on integrating research and assessment methods into major land management programmes, such as TerrAfrica.

The World Agroforestry Centre works with a large number of regional organizations, NARS and Universities on land and soil research. At the regional level examples are: Comité Permanent Inter-Etats de Lutte Contre la Sécheresse au Sahel (CILSS), the Food Agriculture and Natural Resources Policy Analysis Network (FARNPAN) in southern Africa, and the African Highlands Initiative in Eastern Africa. At the national level, examples are: Bunda College (Malawi), University of Nairobi (Kenya), Departments of Agricultural Research and Extension of the Ministries of Agriculture in Burkina Faso, Kenya, Malawi, Mali, Tanzania, and Zambia, Foundation for Ecological Security (India), National Farmer Association of Malawi (NASFAM). Collaboration with advanced institutions includes CSIRO, the Earth Institute of the University of Columbia, and the Universities of Leuven in Belgium, Hohenheim in Germany, and Cornell and California Davis in the USA.

The project also collaborates with the private sector on technological developments for remote sensing of soil quality, such as Bruker Optics of Germany.

### ***Strategic roles of different partners***

CGIAR centres are complimenting the World Agroforestry Centre's expertise in land and soil management. For example, the project is developing infrared spectral indices for assessing soil rehabilitation impacts on soil condition in field trials and on-farm surveys conducted by TSBF-CIAT and ICRISAT in Kenya and Uganda (GP6.1). Advanced research institutes provide critical expertise and resources in specialized areas such as remote sensing and database management — for instance the Centre for International Earth Science Information Networks at Columbia Earth Institute (CIESIN) on global land cyber infrastructure (GP6.1). CSIRO is providing

advanced soil carbon analysis to help advance frontiers on use of mid-infrared spectroscopy for rapid characterization of soil functional carbon pools (GP6.1). The United Nations organizations are playing a key role in promoting land health surveillance approaches to high-level policy makers, for example through joint implementation of a sustainable land management project in West African drylands (GP6.1 and GP6.2).

National research and development organizations are major target beneficiaries of the project but also act as research partners. Their participation is essential for the development of effective decision-support tools. For example, institutions helping to test and further develop soil-testing methods using infrared spectroscopy include Egerton, Jomo Kenyatta and Nairobi universities in Kenya, the National Agricultural Research (IIAM) in Mozambique and Institut d'Economie Rurale (IER) in Mali (G.P.6.1). The same national research organizations and Ministries of Agriculture also help test agroforestry interventions for land rehabilitation (GP6.2). Universities in the target regions as well as in the North contribute to capacity building through joint supervision of students, and provide specialized soil and plant analysis services (for example, stable isotope analysis at the University of California).

The private sector works with the project on new technological developments, such as low cost infrared spectrometers for soil analysis in developing countries. For example, Bruker Optics (Germany) is providing technical support to the World Agroforestry Centre's network of near-infrared spectroscopy laboratories in Africa and the development of high throughput mid-infrared soil analysis (GP6.1).

### **SWP collaborations**

This project will specifically contribute to the Sub-Saharan Africa Programme, especially in the area of natural resource degradation, and to the development of OASIS, principally on land degradation assessment and rehabilitation in drylands.

## **Global Project 7: Agroforestry Systems for Climate Change Adaptation and Mitigation**

### **Rationale**

#### **Project Goal**

To improve the resilience of farming systems and livelihood strategies of small holder farmers to current climate variability as well as long-term climate change, through the increased use of trees for intensification, diversification and buffering of farming systems.

### **Project objectives**

1. Vulnerability Assessment – to assess the social and economic factors that interact to predispose rural households to climate related shocks.
2. Impact of climate change on agroforestry systems – to understand the potential impacts of the different dimensions of climate change (water availability, temperature, rainfall intensity, inter-annual variability) at a number of scales: on agroforestry tree species, on agroforestry farming systems and on agricultural landscapes.
3. Adaptation to climate change – to determine how tree-based systems can be used to buffer smallholder farmers against climate variability and climate related shocks. Adaptive capacity depends not only on the ability to respond biophysically but also on the economic circumstances and institutional infrastructure.
4. Synergies in agroforestry systems between climate change adaptation and mitigation– to assess the carbon sequestration potential of promising adaptation technologies with the view of capturing carbon finance opportunities to scale up adoption of these systems to reduce vulnerability of smallholder farmers.

### **Problem diagnoses**

Developing countries are going to bear the brunt of climate change and suffer most from its negative impacts. Mitigation efforts will only partially soften the effects of climate change. Local climates and terrestrial ecosystems will change, threatening biota and human livelihoods. Yet, even as climate changes, food and fiber production, environmental services and rural livelihoods must improve, and not just be maintained.

Climate change is interacting with a number of factors (e.g. macroeconomic policy, population growth) to limit development aspirations and compromise sustainable rural development. In many poor rural landscapes, where access to inputs such as fertilizer is limited, farming communities have met the food demands of growing populations through extensification of agriculture rather than through intensification. Cultivating marginal lands is risky in the best of times. Climate change is increasing inter-annual rainfall variability and the frequency of extreme events, leading to accelerated rates of degradation of soil and water resources upon which farming communities depend for their livelihoods.

Agricultural systems most vulnerable to climate change are those already affected by unsustainable management, and land and resource degradation. Trees have an important role in reducing vulnerability, increasing the resilience of farming systems and buffering households against climate-related risks.

There are two hypotheses at the centre of this Project:

- Trees are deep rooted and have large reserves, making them less susceptible than annual crops to inter-annual variability or short-lived extreme events like droughts or floods. Thus, trees offer diversification options that can reduce production risks for small holder farmers.
- Trees are a perennial resource that can be exploited to provide increased income during difficult periods, reducing income risks associated with climate-related shocks for smallholder farming families.

The challenge for this global project is to evaluate these two hypotheses in different farming systems, different cultural contexts, and in different landscapes. In conjunction with developing knowledge about the potential for trees to help facilitate adaptation, a number of supporting research questions will come to the fore to generate the knowledge necessary to help development agencies create an enabling environment for broader implementation of agroforestry to facilitate climate change adaptation.

### ***Alignment with CGIAR System Priorities***

GP7 matches most closely with CG System Priorities **4A** (Integrated land water and forest management at landscape level) and **4D** (Agricultural intensification in low/high potential areas). It also contributes to **3D** (Sustainable income from forests and trees), and **5B** (Making international and domestic markets work for the poor).

### ***Alterations in project composition and outputs***

This global project is largely a reformulation Project ES2 (Climate change mitigation and adaptation: Options and decision-support tools in the previous MTP. The original outputs have also been reformulated to create four new outputs as follows:

- GP7.1 Toolbox developed for carbon sequestration project managers (*includes original ES2.1*).
- GP7.2 Models built for assessment of climate change impacts on biogeochemical processes and water relations
- GP7.3 Policy communications produced on avoided deforestation, afforestation and reforestation
- GP7.4 Climate change adaptation options available for small farmers (*includes original ES2.2*)

### **Description of Impact Pathways**

Improved and sustained agroecosystem productivity in the face of climate change, as well as enhanced income generation from smallholder carbon sequestration projects are targeted impacts of this

global project. These impacts will be achieved through the following outcomes:

- Stakeholders using knowledge to enhance climate change adaptive capacity of smallholder farmers in developing countries
- Knowledge utilised on the role of agroforestry and sound natural resource management for enhancing ability of smallholder farmers to adapt to current and future climate change
- Knowledge and decision-support tools operational for investment in smallholder carbon sequestration projects
- Mainstreaming of agroforestry knowledge in climate change adaptation and mitigation initiatives in agriculture, environment and forestry

The World Agroforestry Centre will develop a toolbox for project managers. This toolbox will synthesize a wide variety of research products into user-friendly tools for carbon sequestration projects. The tools will address measurement of 3 carbon pools in agroforestry projects (above-ground biomass, below-ground biomass and soil carbon), creation of enabling institutional environments for these projects, sustainable seed supply, biodiversity analysis, social and economic diagnosis and monitoring, etc.

### ***Conditioning factors***

Climate change adaptation has increasingly gained recognition as a major factor in agricultural development throughout the world. The recent 4<sup>th</sup> Assessment Report from the Intergovernmental Panel on Climate Change (IPCC) emphasizes the potential risks and vulnerability in developing countries, where smallholder farmers are subjected to droughts, delayed onset of rainy seasons, and other perturbations to traditional climatic patterns. There is increasing recognition of the potential role of agroforestry for addressing such vulnerability and development partners as well as international policy makers are calling for major investments by the global community in this area.

Furthermore, the advent of carbon markets over the past decade creates new and significant opportunities for scaling up agroforestry practices for climate change adaptation and sustainable land management. Projections that the carbon market may exceed \$1 trillion by 2025 (current ODA = \$85 billion) suggest that significant funds could potentially be available to finance sustainable rural development and adaptation to climate change. For the moment, the focus of this international discussion is on tree-based solutions because of the obvious carbon sequestration potential of these systems. Unfortunately, as the carbon markets have developed over the past several years, projects focused on rural communities, poverty reduction,

and climate change adaptation through improved land management have not materialized. Although there was a lot of optimism at the beginning of these markets, there are a number of reasons why they have not contributed as much as they should to sustainable development in rural areas.

The World Agroforestry Centre considers these carbon markets to be one of the primary impact pathways for its research. With significant investment in carbon offsets, it is only logical that a significant portion of this investment facilitates adaptation among those who will be most severely affected by climate change, but who have done the least to create the problem – the rural poor. Given this, the World Agroforestry Centre will invest considerable efforts in overcoming the main obstacles to mobilization of carbon finance to scale up agroforestry practices that facilitate adaptation to climate change. These obstacles include:

- Measurement and monitoring of the carbon benefits of improved practices in agricultural landscapes.
- Institutional links between small scale farmers and global carbon markets
- Investor confidence
- Project developer knowledge.

### ***Centre partnerships and capacity strengthening***

This global project will build on strong engagement by the Centre in the UN Framework Convention on Climate Change, and links with major development agencies and non-governmental organizations that will demand and can act upon the information generated in the project. Because of the range of methodological innovations to be employed, major investments in strengthening capacity of partners and target beneficiaries are envisaged.

### ***Target ecoregions***

#### **1. In sub-Saharan Africa**

RAEZ1 Warm arid and semi-arid tropics (AEZ 1)

RAEZ 2 Warm subhumid tropics (AEZ 2)

RAEZ 3 Warm humid tropics (AEZ 3)

#### **2. In Asia**

RAEZ 8 Warm arid and semi-arid tropics (AEZ 1)

RAEZ 10 Warm humid tropics (AEZ 3)

#### **3. In Latin America**

RAEZ 17 Warm humid tropics (AEZ 3)

### ***Beneficiaries and end users***

The key clients and major users of the outputs generated in this project are:

- Funding agencies (World Bank, FAO, DFID, Asian Development Bank, ACIAR, Ford Foundation)
- Development organizations (notably extension systems and international NGOs such as World Vision and CARE)
- Conservation organizations (WWF, Conservation International, The Nature Conservancy)
- National policy makers and programmes
- Research organizations involved in agroforestry and researchers engaged in evaluation
- Global multilateral environmental agreements, specifically the UN Framework Convention on Climate Change (for mitigation options), UN Convention on Combating Desertification (for adaptation in the drylands)

The end beneficiaries of the information will be smallholder farming communities throughout the developing world, benefiting from the uptake and implementation of the project's outputs by the clients noted above.

### ***Centre's roles***

- Mobilize research partnerships from different regions of the world and resources to generate research on agroforestry systems for climate change adaptation and mitigation in the major RAEZs.
- Broker investment opportunities for smallholder carbon through increased awareness and application of measurement and monitoring tools.

## **Research approach to develop International Public Goods (IPGs)**

### ***Advantage of project for generating IPGs***

The potential for agroforestry to help solve the problem of climate change is still under-appreciated. Agroforestry provides a particular example of a set of innovative practices that are designed to enhance productivity in a way that often contributes to climate change mitigation through enhanced carbon sequestration, and that can also strengthen the systems ability to cope with adverse impacts of changing climate conditions. Agroforestry options may provide a means for diversifying production systems and increasing the resilience of smallholder farming systems.

The most worrisome component of climate change from the point of view of smallholder farmers is

increased inter-annual variability in rainfall and temperature. Tree-based systems have some obvious advantages for maintaining production during wetter and drier years.

First, their deep root systems are able to explore a larger soil volume for water and nutrients, which will help during droughts. Second, increased soil porosity, reduced runoff and increased soil cover lead to increased water infiltration and retention in the soil profile, which can reduce moisture stress during low rainfall years. Third, tree-based systems have higher evapotranspiration rates than row crops or pastures and can thus maintain aerated soil conditions by pumping excess water out of the soil profile more rapidly than other production systems. Finally, tree-based production systems often produce crops of higher value than row crops. Thus, diversifying the production system to include a significant tree component may buffer against income risks associated with climatic variability.

Agroforestry has a particular role to play in mitigation of atmospheric accumulation of GHGs. Of all the land uses analyzed in the Land-Use, Land-Use Change and Forestry report of the IPCC, agroforestry offered the highest potential for carbon sequestration in non-Annex I countries. Through this project, the World Agroforestry Centre is well positioned to generate the knowledge to substantiate the above assertions in agricultural landscapes and provide this information to development agencies and policy makers.

### ***IPG nature of outputs***

This global project will generate a range of IPGs including principles, methodologies, and tools that will have widespread relevance for addressing global climate change problems facing smallholder farmers.

- Knowledge of agroforestry-based strategies and options for adaptation in various agro-ecological zones (such as arid and semi-arid regions of Africa, typhoon-prone areas in the Philippines and high-rainfall areas in Indonesia) can be mainstreamed into policies at various levels.
- Knowledge of options for mainstreaming climate change adaptation in agroforestry and NRM projects in developing countries will help leverage investments in smallholder practices.
- Comprehensive estimates of adaptation costs and benefits as well as improved understanding of tradeoffs in terms of impacts to other sectors and the environment, will be invaluable for designing policy options at multiple levels.
- Methods and tools for carbon sequestration projects that are practical for smallholder production systems throughout the developing world.

### ***Additional roles beyond research***

The World Agroforestry Centre will play a key role in linking smallholder farmers to global carbon initiatives and markets by mobilizing private sector investors. The Centre will also facilitate training and capacity building to create local level opportunities for development of tree-based carbon projects.

## **Elaboration of Partners' Roles**

<b>Name of Partner</b>	<b>Collaborative activities</b>	<b>Output</b>	<b>Geographical scope</b>
United Nations Framework Convention on Climate Change Secretariat	Attending the various meetings to participate in international policy formulation	GP7.3 Policy communications on avoided deforestation, afforestation and reforestation	Global
Food and Agriculture Organization of the United Nations (FAO) and United Nations Environment Programme (UNEP)	Taking the science that World Agroforestry develops and mainstreaming these knowledge innovations and best practices for decision making at multiple level.	GP7.3	Global
Worldwide Fund for Nature (WWF), World Vision and CARE	Developing a major initiative on linking carbon finance with poverty reduction in developing countries with these partners by building into their development projects which increasingly tap into agroforestry options.	GP7.1 Toolbox for carbon sequestration project developers	Africa
CARE, Common Market for Eastern and Southern Africa (COMESA)	Building opportunities for investment in smallholder carbon sequestration initiatives	GP 7.1-7.3	East and Southern Africa

Development Agencies in Southeast Asia (Department of Environment and Natural Resources, Philippines; Bureau of Soils and Water Management, Philippines; Ministry of Natural Resources and Environment (MONRE) Vietnam)	Participate in multi-stakeholder meetings and consultations. Climate change policy formulation.	GP7.4 Climate change adaptation options available for small farmers	Southeast Asia
NGOs in Southeast Asia (Landcare Foundation of the Philippines; Centre for Environment Research, Education and Development (CERED), Vietnam)	Participate in climate change adaptation research. Serve as co-study leader.	GP7.4 Climate change adaptation options available for small farmers	Southeast Asia
Universities in Southeast Asia (University of the Philippines, Institute Perrtanian Bogor, National University Lao PDR)	Serve as co-study leader in climate change project.	GP7.4	Southeast Asia
Centre for International Forestry Research (CIFOR)	Collaborate on research on climate change adaptation in watersheds.	GP7.4	Global
Southeast Asian (SEARCA)	Collaborate on policy research on climate change adaptation.	GP7.4	Southeast Asia

### **SWP collaborations**

WorldAgroforestry envisages a major role in the development of a new Challenge Programme on climate change.

## **Global Project 8: Policy Options and Incentive Mechanisms for Strengthening Agroforestry**

### **Rationale**

#### **Project Goal**

Multilateral, national and local policies and programmes are designed and implemented that strengthen farmers' incentives to invest in agroforestry systems that enhance farm income and critical environmental services.

#### **Project objectives**

1. Develop and evaluate policy options for strengthening the property rights, incentives and competitiveness of smallholder farmers who manage trees on farms and in multifunctional landscapes.
2. Develop and refine assessment tools, incentive mechanisms, and institutions for rewarding landusers for environmental stewardship that enhances local, national and global environmental services through agroforestry.
3. Conduct targeted analyses, syntheses, and engagement with stakeholders in multilateral environmental agreements, regional agreements, and national action plans to enhance the positive contributions of agroforestry.

### **Problem diagnoses**

Land use in the tropics involves important tradeoffs between environmental conservation and economic development. For example, monoculture crop agriculture or tree plantations often generate highest returns to land, but often at the expense of environmental services, while native forests or grasslands provide the highest levels of environmental services. In that context, agroforestry is an intermediate land use with potential to generate good

economic returns and acceptable levels of critical environmental services. The environmental values of agroforestry are generally not reflected in the incentives faced by farmers. Indeed, often there are distinct disincentives for farmers to undertake agroforestry.

The incentives and disincentives that farmers face when deciding to invest and maintain agroforestry systems are defined by policies emanating from the agricultural, forestry and environmental sectors. For example, the national and local policies put in place to protect forests and environmental services often have the consequence of reducing incentives for agroforestry. In many countries, agroforestry does not have a "home" ministry per se; *de jure* the components of agroforestry are treated as part of agriculture, environment, natural resource and environment, but *de facto*, agroforestry is given priority in any of these ministries.

Multilateral environmental agreements establish objectives, obligations and opportunities for national

policies and strategies, but rarely harness the potential of agroforestry to advance environmental objectives. Policies and institutions that affect property rights to land and trees are particularly important for agroforestry, where there often are significant time gaps between investment and returns.

There is potential for using new property rights arrangements and flexible environmental policies, often implemented through decentralized forms of government, to strengthen farmers' incentives to invest in agroforestry, usually without jeopardizing forest resources. Mechanisms and contracts that provide conditional rewards for environmental services have potential to provide farmers with incentives to adopt agroforestry systems and other land uses associated with environmental stewardship or restoration.

There is scope for the multilateral environmental agreements – including carbon finance mechanisms under the UN Framework Convention on Climate Change (UNFCCC) -- to further expand the space for supportive property rights and environmental service rewards at the national and local levels. A compelling challenge and opportunity at present is to develop international conventions, national institutions, and landscape-level mechanisms to reduce emissions from deforestation and forest degradation (REDD).

### **Links to CGIAR System Priorities**

GP8 matches closely with the system priority **4A** (Integrated land water and forest management at landscape level), particularly Specific Goal 3: Establish effective rights and opportunities to ensure that the poor benefit equitably from forests and tree resources.

### **Alterations in project composition and outputs**

This project builds upon two projects from the previous MTP: LP3 (Institutional innovations and incentives) and ES3 (Environmental Policy). Specifically, it relates to the outputs LP3.2 (Options for enhancing land and tree tenure rights of smallholder farmers), ES3.2 (Rewards for Environmental Services) and ES3.3 (multilateral environmental agreements) provide most of the basis for GP8.

## **Description of Impact Pathways**

### **Outputs**

GP8.1 Action research findings, assessments and syntheses produced of policy options that can strengthen land and tree tenure rights and agroforestry incentives for smallholder farmers.

GP8.2 Pilot studies, syntheses, tools and policy

options delivered for facilitating mechanisms that recognize, compensate and reward smallholders for providing local, national and global environmental services through appropriate agroforestry strategies.

GP8.3 Syntheses, policy studies and policy options produced and support provided to developing country negotiators on how multi-lateral environmental agreements, regional agreements, and national action plans can be modified to enhance the contributions of agroforestry.

### **Intended users (beneficiaries)**

Intended users include researchers, project developers, policy shapers (including civil society groups) and policy makers. Past experience has shown that the World Agroforestry Centre's research on compensation and reward for environmental services is attracting interest from a broad spectrum of research organizations, non-governmental organizations, UN agencies, donor agencies and businesses. This interest includes South-North transfer of evidence and experience. Research outputs that are intended to influence multilateral and regional agreements are targeted at key stakeholders who negotiate and influence particular processes.

### **Expected outcomes**

The project's outputs will generate distinct outcomes over time: (1) in the near term, the project will enhance the effectiveness of the diverse organizations that are interested in rights, compensation and rewards for environmental services; (2) in the intermediate term, it will support new and more effective programmes — at the local, national and international levels — that recognize, compensate and reward farmers for environmental services; and (3) in the longer term, farmers involved in environmental service mechanisms will plant and maintain significantly more trees and implement other land-conserving practices.

### **End users (ultimate beneficiaries)**

Farmers and communities will benefit from environmental service mechanisms, more coherent approaches to environmental stewardship and poverty reduction, while "mining" of collectively-owned natural resources will be reduced through effective implementation of environmental stewardship.

### **Expected impacts**

Enhanced ecosystem services and human welfare in critical ecosystems around the developing world.

Target Ecoregion(s):

### **1. In sub-Saharan Africa**

RAEZ 1 Warm arid and semi-arid tropics (AEZ 1): West Africa (Mali, Burkina Faso); East Africa (Kenya, Tanzania); Southern Africa (Malawi, Mozambique, Zambia)

RAEZ 2 Warm subhumid tropics (AEZ 2): East Africa (Uganda); Southern Africa (Malawi, Zambia)

RAEZ 3 Warm humid tropics (AEZ 3): Cameroon, Ghana, Guinea.

### **2. In Asia and the Pacific**

RAEZ 8 Warm arid and semi-arid tropics (AEZ 1): India and Thailand.

RAEZ 9 Warm subhumid tropics (AEZ 2): India and Thailand.

RAEZ 10 Warm humid tropics (AEZ 3): Indonesia, Philippines, Sri Lanka and Thailand.

RAEZ 11 Warm arid and semi-arid subtropics with summer rainfall (AEZ 5): China, India, Nepal

### **3. In Latin America and the Caribbean**

RAEZ 17 Warm humid tropics (AEZ 3): Brazil, Peru.

## **Research approach to develop International Public Goods (IPGs)**

The World Agroforestry Centre is becoming a recognized global leader in applied and strategic mechanisms providing rewards for ecosystem services. Indeed, its work in this area was recognized by the EPMR, which cited its contribution as a major IPG that should be strengthened and extended.

The World Agroforestry Centre's approach stresses action research in contrasting sites, the possibility of a range of payment types, development of parsimonious assessment tools to clarify the real links between land use and ecosystem services, the importance of the negotiation process itself, cross-site learning and synthesis, and engagement with policy makers and the private sector. From 2003-5, this work focused on Asia and Latin America.

In Asia, our work has been organized around the RUPES project (Rewarding the Poor for Environmental

Services) and in Latin America around the ProAmbiente programme in the Amazon basin. The period 2006-7 has been a time for generating major syntheses and presenting the work in international fora. It was during this period that the World Agroforestry Centre led a pan-tropical assessment with collaborators from around the world.

From 2008-2010 this research will be deepened in Asia and the Brazilian Amazon, and extended to Africa and other parts of the Amazon basin. The operational project in Africa is entitled PRESA — Pro-poor Rewards for Environmental Services in Africa. These projects are designed to be engaged with reward mechanisms in action research sites as well as in local and national policy dialogue. They are also linked to global expertise and debates and aim at producing international public goods in the fowzefined methods, tested hypotheses and policy-relevant syntheses.

## **Elaboration of Partners' Roles**

The RUPES project involves a range of international organizations, national policy groups, national and local research and development organizations working across Asia, including Indonesia, the Philippines, China, Vietnam, India, Nepal, and Thailand. A similar network will be established in Africa in the 2007-9 period in collaboration with Care International, WWF and various local partners.

In the Amazon Basin, the World Agroforestry Centre conducts similar research on rewards for ecosystem services through the Amazon Initiative Consortium and a number of Brazilian institutions, including the ProAmbiente Programme. We also have a growing collaboration with the Kennedy School of Environment at Harvard University.

The World Agroforestry Centre advances GP8 through consortia of organizations that are engaged in policy experiments in different ways and at different scales.

Name of Partner	What they will do	Output	Geographical scope
CIFOR, Rights and Resources Initiative, CAPRI	<p>CIFOR leads implementation of the Model Forest concept in Central Africa; WorldAgroforestry focuses on the agroforestry component.</p> <p>Rights and Resources Initiative leads a pan-tropical initiative on forest rights, with WorldAgroforestry as the lead organization for Asia.</p> <p>CAPRI and WorldAgroforestry are jointly compiling and editing an edited volume and synthesis of WorldAgroforestry and other CGIAR research on bylaws for natural resource management in Africa.</p>	GP8.1	Links with RRI are strongest in SE Asia and with CIFOR in Central Africa.
Operational collaborators in action research in RUPES, PRESA and ProAmbiente field sites	An average of 3-4 organizations are involved in the establishment and implementation of environmental service agreements at each site, with the roles varying from site to site.	GP8.2	Partners often work at one or two sites, and are linked through national and regional networks.
Collaborators and research – policy networks engaged in national-level dialogs with policy makers and the private sector; Katoomba Network for East and Southern Africa	Draw upon site-level evidence to identify policy constraints and solutions for more effective mechanisms and greater engagement by the private sector.	GP8.2	National-level collaboration in Indonesia, Philippines, Kenya, Uganda, and Tanzania.
IFPRI, Michigan State University, Care International, IUCN, CIFOR, UNEP, ACTS, CGRR, Forest Trends, Harvard University	<p>IFPRI and MSU are providing analytical support for an analysis of the impacts of conditional property rights in Indonesia. PhD Students from Harvard University are analyzing RUPES as a “boundary organization” and helping to design and evaluate prototype payment mechanisms.</p> <p>IUCN, Forest Trends, UNEP, ACTS, CGRR and ISEC are collaborators have written papers and hosted workshops for a pan-tropical scoping study of rewards for environmental services. Care-International is leading the development of schemes for payment for watershed services in Indonesia and Tanzania.</p>	GP8.2	
ASB Partnership for the Tropical Forest Margins; CIFOR; UNEP	<p>The ASB Partnership, led by WorldAgroforestry and CIFOR, is undertaking targeted studies and preparing synthesis documents on the opportunity costs of carbon emissions from land use change in sites across the tropical forest margins.</p> <p>The UNEP Divisions on Environmental Conventions and Law and Policy Implementation are working with WorldAgroforestry to explore the potential for using reward mechanisms to advance the objectives of the multilateral environmental agreements.</p>	GP8.3	

## Global Project 9: Strengthening Agroforestry Institutions and Learning Tools for Linking Knowledge to Action

### Rationale

#### *Project Goal*

Innovative insights and research results that address the key concerns of the main stakeholders in rural lives and landscapes are effectively generated, made accessible and linked to actions by a wide range of actors and institutions that induce the transformations needed to enhance the provision of goods and services from Agroforestry.

#### *Project objectives*

Our overarching objective is to support the development of the right capacity and inter-institutional arrangements that can enhance agroforestry research, education, knowledge management and application in the context of integrated natural resource management and the Millennium Development Goals. To do this well, we will evaluate the current status of agroforestry in local and national institutions and then conceive the value-adding actions that the World Agroforestry Centre can take towards its goal. Two specific objectives emerge from this:

1. To strengthen the capacity for agroforestry science and innovation at national research and learning institutions and systems
2. To enhance the capacity of institutions to manage and share agroforestry knowledge through collaborative arrangements that promote its application and enhancement

#### *Problem diagnoses*

Knowledge-to-action links are urgently needed in a rapidly changing world where new issues and concerns constantly emerge. There are usually no silver bullets or generic solutions that can simultaneously address poverty, environmental degradation, unsustainable resource exploitation in the context of Millennium Development Goals.

In recent years, the challenges at the interface of scientific progress and associated ways of learning as well as of policy and implementation have received increasing attention. Agroforestry straddles the worlds of 'forestry' and 'agriculture' and many related natural resource management areas, each with separate institutions for research, education and policy development. All these interact to shape rural livelihoods and landscapes. Introducing 'agroforestry education' into universities has required and triggered

many types of interdisciplinary cooperation that did not exist before.

Whereas many countries recognize the importance of agroforestry and the presence and use of trees in productive and healthy landscapes, few have established policies and institutions to handle the interface between the sectors related to agroforestry or mainstreamed it into existing institutions. Few agricultural ministries or related institutions are structured to include trees in the agricultural landscape, while most forestry departments or ministries are ill-equipped to deal with farmers. The creation of separate 'agroforestry' institutions would only increase the present challenges.

Thus, there are bottlenecks in the flow and use of agroforestry knowledge. These constraints can be traced to inadequate policies, institutional vacuum, weak collaboration among institutions and inadequate integrated natural resource management research and development capacity. In the last 10-15 years, agroforestry has been incorporated in some college and university programmes, either as a separate line of specialization or as a platform for interdisciplinary cooperation. However, this type of integration may not be fast enough to keep up with the overall trend in which both agriculture and forestry education are losing their appeal and expertise. A much broader array of social, economic, medical, biological, earth science and technical disciplines is needed to make progress in transforming rural lives and landscapes.

At the international level, similar conditions exist between environment- and development-oriented global institutions and instruments such as agreements and protocols. Here, agroforestry concepts can help to form bridges that span these instruments and organizations, but are often excluded 'by definition'. Intensive tree planting efforts are being reinforced the world over, but few of these are sufficiently informed by science to really transform lives and landscapes.

This situation creates challenges in:

- incorporating agroforestry in the agricultural landscapes and in global and regional debates, agreements or protocols, especially those related to agriculture, forestry, biodiversity, climate change and environment.
- locating institutional responsibilities for research and strategizing uptake of improved agroforestry science and practice
- human and institutional capacity development for agroforestry including the role of gender; and
- overall management of agroforestry knowledge, indigenous and from research

At the national scale, adoption and sustenance of the Centre's work requires capable national institutions to take the cue from it in both research and development. This will not happen unless enough resources are committed to enable national institutions to develop adequate capacity for agroforestry research and development that derives from the realities of rural landscapes.

Due to rapid developments in agroforestry science, the World Agroforestry Centre is expanding its research from the plot and farm levels to watershed and landscape levels, where the impact of different tree systems in landscape mosaics over long periods is being evaluated. However, agroforestry cannot be advanced as a sole discipline. Its links with other land-use disciplines requires integration through an innovative systems approach. There is therefore need to have credible partner institutions whose mandates categorically include agroforestry. This project will contribute knowledge and strategies for building such a constituency.

The project builds upon a pedigree of the World Agroforestry Centre's work in strengthening colleges and universities in the past 15 years. The project embraces the principle of multi-way communication: Knowledge comes from many sources (the World Agroforestry Centre, partners and local communities); and knowledge can be tailored to fit the needs of user institutions.

Using knowledge-to-action approaches, the project will identify key constraints in the value chain that links the generation of credible knowledge to its use. The project will ensure:

- relevant and smart identification, prioritization and research on knowledge-to-action problems
- application of a systems approach in the development of workable solutions and testing these with relevant institutions
- credibility of the science behind institutional performance in knowledge management and use
- good understanding and application of 'Boundary principles' that can be used to support the diffusion of useful knowledge, including the use of incentives and coercion

Within the World Agroforestry Centre, the project will:

- Bring together all the work of the eight other Global Projects by synthesizing agroforestry knowledge generated and linking this with that from other sources to organize the accumulated knowledge on agroforestry;
- Strengthen the systems for increasing and linking research outputs with outcomes and impact; and

- Address cross-cutting problems, which have synergistic impacts on the success of projects. One way to address these challenges will be by strengthening the capacity for knowledge management within the World Agroforestry and at partner institutions).

### ***Alignment with CGIAR Science System priorities***

The project's activities are primarily aligned to CGIAR System Priorities **5D** (Rural institutions and their governance) and **5A** (Science and technology policy and institutions). The project outputs will also inform work on **3D** (Income from forests and trees) and **4A** (Integrated land, water, and forest management at the landscape level). Research will be done to reveal the fundamental causes of agroforestry capacity insufficiency. Baseline studies will be undertaken on the recognition of agroforestry in international agreements, protocols and instruments as well as in national policies, institutional frameworks and governance. The challenges of cross-disciplinary integration through agroforestry will also be explored. Specific research questions include:

1. How do policy and institutional arrangements influence the development of agroforestry as a science and practice?
2. What policies and institutional changes are necessary for agroforestry to be mainstreamed into institutional strategies and programmes, considering inter-sectoral integration and linkage mechanisms?
3. What mechanisms can be employed to reinforce the use of agroforestry science and innovations and integration of agroforestry knowledge into other knowledge systems?
4. How can agroforestry be incorporated and used in development strategies and programmes such as those for poverty reduction?
5. What and how do institutional aspects and demographic (for instance, culture, gender, wealth) changes influence the up-take of agroforestry science and practice?

To find answers to these questions, the World Agroforestry Centre will work with a range of institutions from the farmer level to national, regional and global scales. We will study typologies, structures, policies, programmes, operational mechanisms (governance), among other factors.

### ***Alterations in project composition and outputs***

GP9 combines a reformulation of SI1 and SI2 from the previous MTP as well as a new research area on linking knowledge to action.

## Description of Impact pathways

The project has three key Output areas:

- GP9.1 Knowledge gathered and generated on institutional challenges and needs for the advancement of agroforestry
- GP9.2 Policies, learning tools and partner institutional capacity developed for the advancement of agroforestry science, innovation and practice.
- GP9.3 Strategies and networks tested for enhancing and managing agroforestry knowledge.

The *outputs* will inform national, regional and global policy debates and institutional innovations. Research outputs will also inform strategies to integrate agriculture with natural resource disciplines, particularly at national level, and reinforce coordination of research, education and development efforts.

These outputs will lead to the following *outcomes*: improved understanding of the place of trees and agroforestry in human development and environmental conservation; stronger national agroforestry research and academic programmes; improved build up and mobilization of agroforestry capacity at all levels; and better use of integrated natural resource management innovations.

The ultimate *impact* of this project is improvement of farmers' livelihoods and rural environments through adoption of appropriate agroforestry and tree-based solutions.

### Conditioning factors

It is assumed that there will be a general acceptance of agroforestry as providing options for inter-disciplinary integration and for improving livelihoods and agricultural landscapes

### Capacity strengthening needs

A good blend of research and institutional strengthening will characterize work in this area. Through institutional innovation systems and networking, institutions will be strengthened to access, manage and apply relevant knowledge products.

### Target ecoregions

This project covers all ecoregions described in GP1 to GP8 where the World Agroforestry Centre or its partners have significant presence.

### Beneficiaries

The beneficiaries will be primarily national research, education and development institutions (capacity to generate, manage, access and apply agroforestry

knowledge), and international bodies (agreements and protocols). Non-governmental organizations, producer associations, regional bodies involved in agriculture and natural resources will be secondary beneficiaries.

### End users

The outputs will contribute to better targeted national and institutional policies and actions in research, education and development (including boundary organizations, farmer organizations, and farmers' field schools). With increased access to knowledge enhancing the adoption of agroforestry, farmers will be the ultimate users of the knowledge to generate tree products and environmental services.

### Centre's roles

The World Agroforestry Centre's roles include the generation of knowledge products, knowledge brokering, facilitation and advocacy to influence institutional policies and programmes; informing policy and institutional interventions and strengthening capacity. At institutional level, the project will analyse policies, structures, programmes, strategies and linkages that have implications and impact on adoption of specific agroforestry innovations — for instance, through changes in rules and organizations, incentives and facilitation.

## Research approach to develop International Public Goods (IPGs)

Three main types of international public goods (IPGs) will emerge from this project: a) Tools for incorporating agroforestry products and services in agreements, assessments or accounting for natural resources; b) Models for managing agroforestry knowledge-to-actions by a varied typology of institutions and collaborative actions; and c) Strategies to link agroforestry to other knowledge systems and to action-oriented systems and processes. Research will involve studies of institutions, strategies and instruments at all scales from the local to the global levels. Agriculture and natural resources research and education programmes will be studied to identify links and bottlenecks to integration.

## Elaboration of Partners' Roles

Partnerships will play a major role in generating, managing and communication agroforestry knowledge. The general principle of subsidiarity will be applied. The World Agroforestry Centre will build linkages, develop and provide tools, methods and best practices for partner institutions to better implement their agroforestry agendas. The Centre will also facilitate the sharing of tools and methods developed by its partners. The key partners of the

World Agroforestry Centre are therefore divided into four categories as follows:

- Partners in training and learning tools development: All universities that are members of ANAFE and SEANAFE networks and ten selected universities in South Asia and Latin America as well as selected universities in developed countries. The World Agroforestry Centre will play a role in strengthening learning programmes, while the universities will provide and jointly with the Centre supervise postgraduate students tackling specific but well linked research in agroforestry. The Commonwealth of Learning (COL), African Virtual University (AVU), GO-FAU and capacity building networks such as RUFORUM are already key collaborators in this area.
- Partners in developing research solutions and networks: The World Agroforestry Centre will work with the following partners to strengthen the content and quality of agroforestry research, including: National Agricultural Research institutes (NARIS), Forestry Research Institutes (FORIs) and research networks such as FARA, ASARECA, CORAF/WECARD, African Forestry Research Network (AFORNET) and SADC-FARN. Work will be carried out on institutional policies and to support young scientist and postdoctoral programmes.
- Partners in facilitating adoption of innovations: National agricultural extension institutions (governmental and non governmental), private-sector farmer or producer organizations and development partners will need models that work. The World Agroforestry Centre will develop with them options for institutional arrangements and synergies that will enhance agroforestry practice. These institutions will also play key roles in the capture, management and sharing of local knowledge.
- Partners that explore constraints to institutional performance and seeking more rapid adjustment of institutions and practice. Current work in this domain includes cooperation with Harvard University.

Name of Partner	What they will do	Output	Geographical scope
Member universities of the ANAFE and SEANAFE networks.	<ul style="list-style-type: none"> <li>- improve the Agroforestry content in education programmes;</li> <li>- co-supervise graduate students;</li> <li>- develop learning tools; and</li> <li>- communicate and share experiences with others</li> </ul>	GP9.2	Africa and southeast Asia
Ten selected universities in South Asia and Latin America: (e.g. Indian Institute of Agroforestry, Chittagong University in Bangladesh; Faculdade de Ciências Agrárias do Pará (FCAP) in Brazil; Universidad Agronomico de Chapingo (UACH- México, CATIE in Costa Rica)	Provide and jointly supervise post graduate students in the region	GP9.3	Brazil, Peru, Mexico, Costa Rica, Venezuela, Colombia and Bolivia
Commonwealth of Learning and Global Open Food and Agriculture University (GO-FAU); African Virtual University (AVU)	Support the inclusion of Agroforestry in distance- open and web-based learning systems and tools	Virtual learning tools and products	Global
Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), African Academy of Sciences (AAS) CGIAR Alliance (CGIAR Regional Plan for Collective Action in East and Southern Africa, FARNPAN and ASARECA, AFORNET, AfNET.	Lead an initiative for improving the research quality and methods in Eastern Africa. ICRAF-ILRI Research Methods Group will be a partner in this initiative. The networks will complement the work of ANAFE and SEANAFE, expanding the content to include natural resources management	GP9.1 and GP9.2	Africa

National Association of State Universities and land grant Colleges (NASULGC), Harvard University	Contribute to the knowledge to action conceptual framework	GP 9.1	Global
National Agricultural Research institutes (NARIS), Forestry Research Institutes (FORIs). (e.g. Kenya Agricultural Research Institute (KARI), National agricultural Research Organization (NARO- Uganda), EMBRAPA)	<ul style="list-style-type: none"> <li>- Institute policies and support of young scientists;</li> <li>- develop robust Agroforestry research and postdoctoral programmes;</li> <li>- Facilitate links for sharing innovations with end users</li> </ul>	GP 9.1	Africa, Asia, Latin America
Forum for Agricultural Research in Africa (FARA), ASARECA, Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricole CORAF/ WECARD, African Forestry Research Network (AFORNET) and South African Development Community (SADC-Food Agriculture and Natural Res) s)	<ul style="list-style-type: none"> <li>- Provide platforms for regional policy debates among partners;</li> <li>- Serve advocacy functions, especially with donors and governments; and</li> <li>- Support regional and sub-regional analyses and syntheses</li> </ul>	GP 9.3	Africa

## Global Project 10: African Highland Initiative

### Rationale

The African Highlands Initiative (AHI) is an ecoregional research programme of the CGIAR and a regional network of ASARECA that focuses on developing tools and methods to improve the impact of research on development, particularly in reversing natural resource degradation and increasing returns to land and labour in the densely populated Eastern and Central African (ECA) highlands.

### Goal

The goal of AHI is to enhance local stakeholder capabilities to sustainably manage their agricultural systems so as to improve their economic opportunities and well being. The purpose is to have integrated natural resource management (INRM) innovations, strategies, and policies used in Eastern and Central Africa highlands.

### Objective

The programme operates through two main objectives:

1. To integrate action and empirical research, and catalyze methodological innovations within and among partner organizations to better address the needs of the target population and ecoregion. Methodological innovations cut across farm, watershed and district levels. They emphasize systems intensification and diversification; collective action and governance; management of landscape-level processes to optimize returns to diverse system components and land users; enhancing synergies among technological, policy

and institutional innovations; and district-level institutional innovations.

2. To institutionalize related principles, methods and practices within research and development institutions in the region. This is achieved through a combination of facilitated institutional change processes, formal trainings, competitive grant systems, publication and knowledge sharing, and networking. The project also strives to understand and develop strategic partnerships and linkages required to scale up/out of INRM approaches and methods at district, national and regional levels.

### Problem diagnoses

Decline in agricultural productivity and increasing natural resource degradation in the humid highlands of eastern Africa is a consequence of a host of factors, including inappropriate methods and practices employed by the research and development organizations. Most strategies used by R&D organizations: ( i) tend to be reductionist in their orientation and emphasize short-term economic returns at the expense of sustainability; (ii) neglect social dimensions such as local institutions and knowledge, gender and equity; and (iii) develop technologies with little input from farmers, limiting adoption in areas characterized by high levels of heterogeneity.

In the mode of operation of the R&D organizations, research is isolated from development, duplication of activities and lost opportunities for collaboration and scaling up. AHI aims to improve effectiveness by developing an integrated natural resource management approach that uses collaborative partnerships and R&D work teams to pull together the necessary expertise to make a difference.

## Alignment with CGIAR Science Priorities

AHI's emphasis on systems intensification and diversification at farm level and on integrated watershed management to optimize production with conservation of nutrients, water and biodiversity at landscape level, are directly aligned with several CGIAR science priorities. The most direct linkages are with:

- **4D** (sustainable agro-ecological intensification in low- and high-potential areas) and **4A** (Integrated land, water and forest management). Various aspects of this project directly support this priority. They include the following objectives that aim to: develop methods to increase income generation while ensuring sustainable nutrient management and groundwater recharge; optimize production of crops, livestock and trees; and strategically match technological and management innovations with social and biophysical niches.
- **5A** (Science and technology policies and institutions) and **5C** (Rural institutions and their governance). Approaches for strengthening demand-driven development and the governance of development inputs, landscape-level processes and natural resources of common interest; scaling up and institutionalization of INRM all support this priority.
- **5D** (Improving R&D options to reduce rural poverty and vulnerability). Objectives in support of this intervention include: Identifying social and ecological principles and practices to enhance income generation while reducing vulnerability stemming from natural resource degradation, a reduced crop genetic base and erosion of institutions of governance.

AHI also provides secondary support to additional CGIAR priorities, as follows:

- **2A** (Maintaining and enhancing yields of staple crops): Integrating germplasm, crop husbandry and integrated nutrient management innovations.
- **2C** (Enhancing nutritional quality and safety): Optimizing income generation, household nutrition and natural resource management through farm-level innovations.
- **3A** (Increasing income from fruit and vegetables): Integration of high-value enterprises matched to farmers' preferences and market demand.
- **4C** (Improved water productivity): Technological and governance interventions at landscape level and (V) improving rural institutions and their governance by enabling local communities to participate and benefit from ecosystem services.

## Description of impact pathways

AHI's output-outcome-impact pathway is organized under two main goals:

- Goal 1: To develop and promote demand-driven INRM innovations at watershed and district levels to balance income generation with conservation.
- Goal 2: To enable more widespread impact from INRM through analysis, documentation and dissemination of lessons and methods, and via increased institutional investment and change among R&D organizations.

### Output areas

AHI 1.1. Pilot Implementation of Integrated Watershed R&D Interventions: Key outputs are methods and approaches for integrated natural resource management at farm and landscape level that: (1) optimize returns to household income, nutrition and system nutrients; (2) harmonize interactions among adjacent landscape units and users while making more efficient use of land, labor, nutrients and water; (3) enable local communities to participate and benefit from environmental services including participation in carbon trading; and (4) empower local communities to sustain these efforts. Another is (5) a redefinition of the role of benchmark sites in scaling up of INRM lessons and practices. Other outputs are:

- INRM innovations developed and utilized to advance community-based participation in watersheds
- Development strategies, policies, and practices for INRM are facilitated
- Supportive institutions and institutional arrangements for INRM are piloted
- INRM information that enhances knowledge base of R&D actors is provided

AHI 1.2. Pilot Implementation of District Institutional Innovations for INRM: Key outputs are methods and approaches for integrated natural resource management at district and institutional levels that: (1) foster enhanced cooperation and synergy between research and development institutions to increase returns from development interventions; (2) improve governance of natural resources and development processes; (3) enhance equitable income capture while sustaining the natural resource base; (4) facilitate district-level innovation platforms using the Landcare approach; and (5) link district-level innovations and institutional arrangements in INRM to national and regional level processes.

AHI 2.1. Institutional Change in Support of INRM: Institutional change in support of integrated,

participatory NRM is strengthened among research and development organizations across the ecoregion through advocacy, self-led organizational change, capacity building and mentoring. Further, partnerships of choice in INRM are described from linkages developed at district, national and regional levels.

AHI 2.2. Knowledge Management: Increased knowledge base of R&D actors at national, regional and global levels on INRM principles, methods and impacts through improved information capture, packaging and sharing.

### ***Beneficiaries (expected users of outputs)***

National agricultural research and extension systems, local government, NGOs, community-based organizations and private service providers, targeted for application of better methods for strengthening communities' capacity to achieve multiple system objectives while enhancing their adaptive capacity will use the outputs. Others include managers of research, development and educational institutions targeted for institutionalizing INRM methods and practices in their own organizations. Also to benefit directly are regional bodies and networks involved in rural development as well as regional stakeholders seeking to influence regional policies on natural resource management and facilitate cross-border scaling up of the lessons and experiences.

### ***Expected outcomes***

- Land users and local institutions are better able to reconcile short- and long-term goals and to optimize use of limited resources for improved livelihood.
- Research and development organizations have access to and utilize methods and approaches that make the social and biophysical tradeoffs of current and alternative land use scenarios explicit, and that assist households and communities in optimally managing these methods and approaches.
- Local government uses lessons and tools to more effectively support communities in improving the governance of development processes and natural resources, and to support R&D actors to harmonize their activities to enhance returns to investment.
- Local communities and development institutions are empowered with tools and knowledge to optimally integrate and sequence technological, social and policy dimensions of development and natural resource management.
- Local communities acquire an increased role in ecosystem stewardship.

- Regional organizations are able to use the INRM lessons for experiences for cross-boundary planning.
- Improved capacity of NARIs, NGOs, extension personnel and government employees to integrate INRM methods into everyday practice.
- Staff from research, development and educational institutions supported through organizational structures, processes and technical support services in the application of INRM principles and methods.
- Increased awareness and application of the principles and practice of INRM among R&D organizations and professionals in the ECA region and beyond.
- Tailor-made methods available specifically targeting policy makers.
- Attitude change illustrated by a more robust system of implementation in R&D amongst targeted institutions, organizations and networks.

### ***Conditioning factors***

- Lack of clear linkages between institutions addressing NRM constraints.
- Mismatch between national and district-level policy formulation with local level policy implementation.

### ***End users (ultimate beneficiaries)***

Smallholder farmers located in densely settled highlands of ECA will benefit from increased ability to optimize returns from diverse system components (soil, crops, water, livestock, trees), integrate technological with market and governance innovations, effectively engage in ecosystem services schemes, and generate income and food in the short-term, while sustaining the natural resource base and minimizing vulnerability. They will also benefit from increased institutional coordination, capacity and support to assist them manage the complex tradeoffs they face in allocating limited resources among diverse enterprises. These challenges include those in balancing short-term economic gains with longer-term NRM investments and reductions in risks and vulnerability, and investing in individual vs. public goods.

In addition to widespread application of proven technological, social, economic and governance innovations to reverse land and biodiversity degradation and improve livelihoods, small holder farmers will also be empowered through a wider representation in policy reforms at both local and national levels.

## **Expected impacts**

Better integrated management of natural resources (soil, crops, water, livestock, and trees), more sustainable production, increased income and food and reduced risk and vulnerability.

## **Target Ecoregions**

The target ecoregion encompasses the densely settled mountain areas of ECA with clear signs of natural resource degradation. This ecoregion covers parts of Ethiopia, Eritrea, Uganda, Tanzania, Kenya, Madagascar, Rwanda, DR Congo and Burundi. More humid densely populated highlands constitute about 23% of the total landmass in the region, yet house over 50% of the population because they are better suitable for human habitation. These highlands can be categorized as warm sub-humid tropics and cool tropics. They are generally characterized by high population density, small land size, land degradation, poor infrastructure, limited livelihood options and poverty. These areas provide critical environmental services to local, lowland and urban residents alike.

Many of the methods and approaches are also applicable to other ecoregions with densely populated agricultural landscapes, high levels of natural resource degradation and/or coupled interactions among adjacent landscape units and land users.

## **Research approach to develop International Public Goods**

AHI works in a series of benchmark sites which serve as the source of methodological innovation. It is within these pilot districts and watersheds that integrated technological, social, economic and institutional innovations are developed and tested through a combination of action and empirical research. AHI works in close partnership with national agricultural research institutes and district partners (agricultural extension, local government and civil society) to jointly plan, implement, adapt and evaluate new approaches under development. Cross-site analysis around 'higher-order' research questions and themes enables synthesis of good practice and improved understanding of what works where, and why.

AHI's research and associated IPGs within Project AHI 1 fall under four thematic areas:

1. *Systems intensification and diversification*, which emphasizes approaches for optimizing returns from limited resources at farm level.
2. *Participatory integrated watershed management*, which focuses on natural resource management and governance issues at landscape scale.

3. *Collective action in natural resource management*, which explores the added value of collective action and the conditions enabling collective investment in public goods.
4. *Policy and institutional innovations* to understand the role of innovations within and among support institutions and improved natural resource governance in improving livelihoods and enabling more integrated, sustainable management of natural resources.

Project AHI 2 largely focuses on the delivery of IPGs from Project 1 to the end users (policy makers, local government and research, development and educational institutions) to expand impacts among the beneficiary groups. Specific IPGs from this project include:

- The process for institutional change and the institutionalization of new paradigms, and
- The process of scaling up INRM practices methods and approaches

Effective delivery of these IPGs calls for careful planning as well as research to capture lessons about the strengths and shortcomings of different approaches. This research may be embedded within a single institutional change process, synthesize lessons across a set of cases or be conducted as a retrospective analysis.

IPGs from Projects 1 and 2 are delivered to end users through a knowledge management strategy consisting of improved information capture in the implementation phase (participatory monitoring and evaluation, process documentation and impact assessment) and information packaging and dissemination.

## **Elaboration of partners' roles**

AHI works in benchmark sites in close collaboration with national partners to design, test, and monitor and synthesize methodological innovations and associated impacts. Interdisciplinary teams of research and development actors from national agricultural research institutes and extension departments as well as NGOs and local government partners, are the primary implementing bodies in benchmark sites. A small Regional Research Team with complementary disciplinary expertise (systems perspectives, social science) provides technical support to site teams in planning, field-testing of approaches, review and synthesis.

## **Comparative advantage**

Integrated natural resource management is a knowledge-intensive process that requires attention to the "process" as much as the "content" of development and sustainability. AHI has specialized

methodologically in the form of social, action-based learning approaches for collaborative development and testing of new approaches for INRM in partnership with national partners and communities. This has enabled the generation of IPGs not only in the form of increased rates of adoption of NRM technologies and localized livelihood impact, but in the form of methods and approaches to enable such localized impacts to be scaled up and institutionalized within R&D institutions in the region.

The abundant knowledge generated in the benchmark sites will be scaled up and institutionalized by involving AHI partners at national and regional levels. As most of this work is conducted as action research, engaging in development-oriented processes represents no conflict of interest with respect to the development of IPGs. Where this is not the case, AHI will use a Training of Trainers approach to quickly devolve knowledge to national partners best suited to institutionalize this knowledge within their own organizations or among their client groups.

## **Global Project 11: ASB Partnership for the Tropical Forest Margins**

### **Rationale**

#### ***Project goal***

Raise productivity and income of rural households living in the tropical forest margins without increasing deforestation or undermining essential environmental services.

#### ***Project objectives***

1. To improve understanding of the tradeoffs between agricultural productivity, human well-being, deforestation and environmental services associated with different land uses at the tropical forest margins and the potential for technologies, policies, institutions and negotiation approaches to optimize those tradeoffs.
2. To synthesize results and policy implications from cross-site and cross-regional comparative analyses and make them easily available to international, regional and national policy processes shaping land use at the tropical forest margins.
3. To facilitate information exchange, collaborative projects, and capacity building among local, national and international organizations for more effective research on land use at the tropical forest margins.

### ***Problem Diagnoses***

Tropical rainforests are falling fast. Causes of deforestation are complex, including agricultural

expansion, road building, and market forces.

Deforestation is often blamed on the slash-and-burn practices of poor migrant smallholders, millions of whom use this method to clear and cultivate small areas of forest. However, other groups often clear much larger areas. These groups include plantation owners, ranchers, loggers, and state-run enterprises and settlement projects. Clearing of forests often leads to conflict between these more powerful groups and smallholders, and between farmers and state agencies.

For poor people making a living in the tropical forest margins, conservation does not (yet) pay. Attempts to impose conservation by regulation either fail altogether or benefit the powerful at the expense of the poor. So far, global markets have not valued the environmental benefits of tropical forests.

However, markets for environmental services are beginning to emerge. At the local level, there is most interest in watershed services. Starting in December 2005, there has been increasing international discussion on the urgent need to slow greenhouse gas emissions resulting from tropical deforestation. The Stern Report, published in 2006, gave particular attention to the potential for reduced deforestation as a cost-effective approach to reduce greenhouse gas emissions. Designing an appropriate international mechanism, consistent with nationally-determined programmes for reduced deforestation, is a formidable challenge. In a bid to overcome this challenge, understanding the tradeoffs between conservation, environmental services and local livelihoods is crucial. No single group or organization has the means or expertise to tackle these complex, interlinked problems by itself.

### ***Alignment with CGIAR System Priorities***

ASB won the CGIAR partnership award in 2005. The ASB external programme and management review, published in June 2006, concluded that the ASB partnership continues to be highly relevant to the CGIAR's goals and is pursuing work that fits well with CGIAR System Priorities, notably Priority **4A** (Integrated land, water and forest management at landscape level), with major contributions to specific goals 1, 2, 3 and 5; and **5B** (Making international and domestic markets work for the poor).

### ***Alterations in project composition and outputs***

One external and one internal event that have in the past year have prompted some modification of the ASB project. Externally, the international community has paid a lot of attention to the need to slow tropical deforestation and the potential for market-based mechanisms to reduce greenhouse gas emissions from deforestation. For example, the UNFCCC meeting held in Bonn in May 2007 had no fewer than nine side

events that discussed these topics. Despite this interest, however, formal negotiations are moving slowly.

The internal event is the finalization of the EPMP report for ASB. The review found that ASB:

- "... contributed directly to the design of innovative policies, legislation, and institutions across the pantropic domain."
- "... [is] the world's leader in integrated, interdisciplinary research on the human and environmental consequences of land use choices in that domain."
- "... has already begun to influence natural resource management in ways that have led not only to income and environmental benefits but also to avoidance of substantial economic and environmental losses, as well as occurrence of damaging conflict."
- "... was cited by many as their 'standard' for how productive international collaboration on NRM [natural resource management] challenges should be organized."

The MTP for 2008-2010, therefore, builds upon past success, addresses the recommendations of the EPMP and gives particular attention on the challenges of avoiding deforestation with sustainable benefits. The first objective spells out the research objective of ASB more clearly (responding to EPMP Recommendation A). The second objective clarifies the need to propel and synthesize ASB results into particular research and policy communities (Responding to EPMP Recommendation B). The third objective combines the networking and capacity building activities and clarifies that the purpose of networking and capacity building is to enhance efficiency of research and knowledge sharing (responding to EPMP Recommendation C).

## Description of Impact Pathways

### Outputs

- ASB1. Site-specific results and cross-regional syntheses of tradeoffs at the tropical forest margins and options for optimizing those tradeoffs.
- ASB2. Results on tradeoffs and policy options are disseminated to national, regional and international stakeholders and policy fora, with particular emphasis on policy processes identified as having greatest potential for advancing the ASB goal.
- ASB3. An efficient, productive and member-owned research network at the national, regional and international scales.

### Intended users (beneficiaries)

Intended users include the growing research, development and policy communities concerned with rural development, deforestation and environmental services in the tropical forest margins.

### Outcomes

- Researchers working at the tropical forest margins conduct research that is more effective and better linked to important policy processes.
- Workable organizational structures and processes identified and implemented that link integrative science with policy and practice in the search for better approaches to poverty reduction, natural resource management, and rainforest conservation.
- Policy makers at the national and international scales adopt policies, negotiation processes and institutions that reduce incentives for deforestation.

### Impacts

- Appreciable slowing in the rate of tropical deforestation in countries that consider ASB outputs in the design of policies, incentive systems and negotiation approaches.
- Smallholder farmers living in the tropical forest margins have more secure land rights and incentives to undertake investments and land uses consistent with essential environmental services.

### End users (ultimate beneficiaries):

Current estimates by ASB indicate that more than 1.8 billion people live within the humid tropical and subtropical forest biome, two-thirds of them in rural areas. Most are in poor households directly dependent on forest resources and agriculture for their livelihoods. Other poor households suffer indirectly from wastage of these resources and environmental degradation. Because ASB's target ecosystems supply global public goods (globally-significant habitats and carbon storage), beneficiaries also include the earth's entire population.

### Target ecoregion(s)

ASB works at the margins of the world's remaining tropical rainforests, in landscape mosaics comprising both forests and farms. These rainforests are an invaluable natural heritage. They are also home to over one billion rural people, the vast majority of whom are poor and depend directly on forest resources and agriculture for their livelihoods. The present ASB network includes 6 countries in the humid tropics. It is envisaged that the network will expand considerably in the next years.

### 1. In sub-Saharan Africa

RAEZ 3 Warm humid tropics (AEZ 3): Cameroon

### 2. In Asia and the Pacific

RAEZ 10 Warm humid tropics (AEZ 3): Indonesia, Philippines and Thailand.

### 3. In Latin America and the Caribbean

RAEZ 17 Warm humid tropics (AEZ 3): Brazil and Peru

## Research approach to develop International Public Goods (IPGs)

The ASB Systemwide Programme has been designed to produce International Public Goods. The Global Steering Group identifies issues and policy problems to be addressed, with priority given to problems common across the tropical forest margins. Thematic working groups then develop and agree on the methods to be applied and syntheses to be generated. Site-specific work, using common protocols, is done through teams of national and international scientists. Synthesis teams draw together results by site, theme and across sites and themes. Engagement with international policy processes clarifies the potential for linking site-specific research to global issues.

## Elaboration of Partners Roles

ASB is a multi-level, global consortium of more than 80 institutions governed by a Global Steering Group. The

global consortium includes:

- 5 Centres (CIAT, TSBF-CIAT, CIFOR, World Agroforestry Centre and IITA)
- 6 national systems (Brazil, Peru, Cameroon, Thailand, Indonesia, and the Philippines)
- 7 local and national NGOs in developing countries
- 8 other national agencies in developing countries
- 13 universities in developing countries
- 14 advanced research institutions and international organizations.

The ASB consortium received the CGIAR Science Award for “Outstanding Partnership” in 2005. The ASB partners play complementary roles in providing funding, expertise, governance, coordination and bridges to impact in pursuing their common goal.

ASB’s Global Coordination Office supports and coordinates the work done by partner organizations. A Global Steering Group made up of 12 representative organizations — balancing institutions and perspectives from the South and the North — serves as ASB’s governing body. The Group determines priorities and approves annual work programmes, budgets and the allocation of funding. The programme is hosted by the World Agroforestry Centre, which provides a variety of institutional support, including financial controls. The World Agroforestry Centre’s Board of Trustees have fiduciary responsibility for the ASB programme.

## Role of Partners

Name of Partner	What they will do	Output	Geographical scope
CIFOR, IITA, CIAT, TSBF / CIAT	Collaborate in studies of carbon emission abatement costs in ASB sites in Latin America, Asia and Africa.	ASB1, ASB2, ASB3	Humid tropics of Africa, Asia, and Latin America
NARS organizations in Thailand, Philippines, Indonesia, Cameroon, Brazil and Peru	Collaborate in studies of carbon emission abatement costs in ASB sites in Latin America, Asia and Africa. Indonesia organizations will co-lead events on REDD.	ASB1, ASB3	Humid tropics of Africa, Asia, and Latin America
Advanced research institutes in Europe and North America	Complement ASB studies of carbon emission abatement for greater impact on the UNFCCC processes. Contribute advanced research methods and skills.	ASB1	Humid tropics of Africa, Asia, and Latin America



World Agroforestry Centre  
TRANSFORMING LIVES AND LANDSCAPES

# MTP LogFrames



# MTP LogFrames

## GPI LogFrame - Multiscale Assessment of Agroforestry Practices and Impacts

Output GP1.1 Agroforestry opportunities and priority investment areas identified, assessed and recommended			
Output Targets	Intended Users	Outcomes	Impacts
<p>2008</p> <p><i>Policies/Strategies:</i> (1) Briefs meetings and workshops for policy makers on strategies to promote silvo-pastoral systems in Latin America; and for (2) Integrated tree crops / agroforestry systems in SE Asia.</p> <p><i>Other Knowledge:</i> (1) Analysis of household resources and poverty and implications for agroforestry and NRM for several major farming systems of Africa, SEA and South Asia and Latin America.</p>	<p>Policy makers</p> <p>Development and environmental organizations</p> <p>Funding agencies</p> <p>Scientists at national and international research institutes</p>	<p>Increased recognition of the potential benefits and constraints of agroforestry in development strategies and policies</p> <p>Better informed decisions by agroforestry programmes/projects and other development partners as to appropriate agroforestry systems, species, and methods for their dissemination and diffusion</p> <p>Increased ability among agroforestry research, development, and policy stakeholders to determine investment opportunities and returns to agroforestry</p> <p>Improved capacity for impact monitoring and assessment in agroforestry and NRM</p>	<p>Investments in agroforestry development by national and international organizations are more effective in creating livelihood and environmental impacts at scale</p>
<p>2009</p> <p><i>Other knowledge:</i> (1) Typologies of agroforestry techniques, their resource requirements &amp; yields in SE Asia</p> <p><i>Practices:</i> (1) Household level land use decision models in SE Asia; (2) improved methods for dissemination / diffusion of fodder shrubs developed, (3) economic and ecological impact assessment tools, spatial analysis tools and tradeoff analysis in SE Asia.</p>			
<p>2010</p> <p><i>Practices:</i> (1) Effectiveness of agroforestry dissemination methods tested in southern Africa and west Africa</p>			

Output GP1.2 Agroforestry impacts on livelihoods and landscapes assessed and analyzed			
Output Targets	Intended Users	Outcomes	Impacts
<p>2008</p> <p><i>Other Knowledge:</i> (1) Equity impacts of agroforestry in east Africa assessed; (2) analysis of fruit and timber agroforestry systems on household welfare in south Asia; (3) analysis of productivity impacts of agroforestry systems in southern Africa; (4) assessment of rubber agroforestry and other integrated tree-crops / agroforestry systems on environmental degradation in SE Asia</p> <p><i>Practices:</i> (1) Methods for assessment of agroforestry impacts on land degradation at landscape scale tested across multiple sites in Africa and south Asia.</p>	<p>Scientists at national and international research institutes</p> <p>Policy makers</p> <p>Development and environmental organizations</p> <p>Funding agencies</p>	<ul style="list-style-type: none"> <li>Increased recognition of the potential benefits and constraints of agroforestry in development strategies and policies</li> <li>Better informed decisions by agroforestry programmes/projects and other development partners as to appropriate agroforestry systems, species, and methods for their dissemination and diffusion</li> <li>Increased ability among agroforestry research, development, and policy stakeholders to determine investment opportunities and returns to agroforestry</li> <li>Improved capacity for impact monitoring and assessment in agroforestry and NRM</li> </ul>	<p>Investments in agroforestry development by national and international organizations are more effective in creating livelihood and environmental impacts at scale</p>
<p>2009</p> <p><i>Other knowledge:</i> (1) Long-term farm-level resource use under agroforestry in SEA; (2) analysis of fruit, fodder, and timber agroforestry systems on household welfare in east Africa; (3) analysis of the capability of agroforestry interventions to influence women's control over resource and production in key farming systems of Africa.</p> <p><i>Practices:</i> (1) Methods for integrated socio-economic and biophysical landscape scale assessment of agroforestry impacts developed.</p>			
<p>2010</p> <p><i>Practices:</i> (1) Procedures for systematic assessment of African soils and responses to interventions across Africa tested across all agro-ecological zones of Africa; (2) Systematic assessment tools for evaluation of land use options, including agroforestry, on livelihoods and environment in SE Asia</p>			

## GP2 LogFrame - Tree Genetic Resources and Domestication

Output 2.1 Strategic technologies and management approaches developed and promoted for domestication, characterisation and conservation of agroforestry tree genetic resources.			
Output Targets	Intended Users	Outcomes	Impacts
<p>2008</p> <p><i>Materials:</i> (1) Documentation of plus trees of <i>Dacryodes edulis</i> existing in ex situ conservation stands in west Africa characterized and breeding protocols developed for partners</p> <p><i>Policy/Strategy:</i> (1) Strategy paper on current status of research and development of indigenous fruit species in southern Africa.</p> <p><i>Practice:</i> (1) Elite timber and fruit species screening, site matching and farm validation in east Africa</p> <p><i>Other knowledge:</i> (1) Improved knowledge on propagation and management of priority species developed and documented in South Asia along with updating of database for South Asian agroforestry species</p>	<p>Researchers in NARS, ARIs, universities.</p> <p>Ministries of agriculture and natural resources and other development institutions.</p> <p>Extension systems, NGOs, CBOs and land users.</p>	<p>Development organizations and policy makers advocate the use of participatory tree domestication techniques in the sustainable use and management of tree genetic resources..</p>	<p>Widespread adoption of participatory tree domestication and increase cultivation of high valued trees in agroforestry systems and farm level productivity and environmental resilience.</p>
<p>2009</p> <p><i>Material:</i> (1) for 3 species, quality mother plants identified for selection and multiplication.</p> <p><i>Policy/Strategy:</i> (1) Generic participatory tree domestication strategies produced for fruits and medicinal species in WCA and in South Asia,</p> <p><i>Practice:</i> (1) Compile manuals for students and researchers for analysis of dominant and co-dominant markers and develop methodology of forecasting demand to meet WHO standard of fruit intake for small holder communities</p> <p><i>Other knowledge:</i> (1) Extension and training manuals (leaflets) on participatory tree domestication published in west Africa.</p> <p><i>Capacity:</i> Partners trained in at least 5 countries on participatory tree domestication in west Africa.</p>			
<p>2010</p> <p><i>Policy/Strategy:</i> (1) A manual developed for high quality seed and seed production systems</p> <p><i>Practice:</i> (1) Guidelines for domestication of agroforestry species across the tropics; (2) Training manual on tree domestication process developed</p>			

**Output 2.2 Improved and sustainable technologies and strategies for collection, procurement, multiplication, dissemination and deployment to meet demands of quality agroforestry tree genetic resources by farmers and stakeholders**

Output Targets	Intended Users	Outcomes	Impacts
<p>2008  <i>Practice:</i> (1) Guidelines for 'germplasm supply systems in east Africa' produced  <i>Other knowledge:</i> (1) decentralized germplasm supply systems analyzed for 3 fruits and 3 timber species in east Africa  <i>Capacity:</i> (1) Facilitate wider use of Tree Seed for Farmers tool kit by developmental and governmental organizations in east Africa</p> <p>2009  <i>Practice:</i> (1) Practices on germplasm production and handling for key indigenous trees developed for west Africa combined with regional training for professional nurseries operators on mass multiplication techniques of regional priority agroforestry species; (2) Tools on managing decentralized germplasm supply system developed and tree germplasm networks identified and supported; (3) Guidelines developed for multiplication of timber and fruit tree species of relevance to west Africa, south Asia and east Africa</p>	<p>Researchers in NARS, ARIs, universities.                      Ministries of agriculture and natural resources and other development institutions.                      Extension systems, NGOs, CBOs and land users.                      Policy makers.                      Managers of education and training institutions.</p>	<p>Partners and smallholders farmers take up improvement propagation methods in the multiplication of agroforestry species.                      Tree multiplication skills of regional nursery operators enhanced.</p>	<p>More stable and productive tree germplasm available for cultivation of agroforestry species contributing to enhanced food security and protection of the environment.</p>
<p>2010  <i>Policy/Strategy:</i> (1) review paper on best strategies for agroforestry seed and seedling systems in the tropics; (2) Policy guidelines on decentralized seeds and seedlings systems developed for east Africa  <i>Practice:</i> (1) Approaches developed and documented for involving tree nursery operators in germplasm dissemination in east Africa and develop approaches for mapping seed sources and ecological and economical sustainability range for priority species in east Africa</p>			

**Output 2.3 Existing strategies improved and new approaches developed for documenting and disseminating information on the use, domestication, distribution and management of agroforestry tree species genetic resources.**

Output Targets	Intended Users	Outcomes	Impacts
<p><i>2008</i>  <i>Practices:</i> (1) Manuals developed for researchers and implementers within national institutes and other stakeholders to quantify, analyse and interpret genetic diversity within agroforestry systems  <i>Other Knowledge:</i> (1) Book on indigenous fruit trees in the Tropics produced.                      (2) Position papers on management of tree genetic resources within tropical agroforestry systems developed and a review on genetic diversity in tropical fruit trees compiled.  <i>Capacity:</i> (1) 1 PhD and 3 M.Sc students trained in southern Africa</p>	<p>Researchers in NARS, ARIs and universities.                       Ministries of agriculture and natural resources and other development institutions.                       Extension systems, NGOs, CBOs and land users.                       Policy makers and funding agencies.</p>	<p>Development implementers use improved tools and knowledge to make more informed choices of selecting quality germplasm of local fruit trees for integration in agroforestry systems.                       Improved agroforestry principles and options for smallholder farmers will be adapted and applied by development organizations.</p>	<p>Widespread cultivation of quality germplasm of improved varieties, increased farm level productivity, and environmental resilience on smallholder farms.</p>
<p><i>2009</i>  <i>Material:</i> (1) Regional germplasm genetic conservation (<i>ex situ</i> bank) achieved for <i>Vitellera paradoxa</i> in west Africa.  <i>Practice:</i> (1) Publication of a generic tool kit for phenotypic characterization of indigenous fruit trees in the context of tree domestication in west Africa, southern Asia and east Africa  <i>Other knowledge:</i> (1) 8 journal articles produced on indigenous fruit and medicinal trees from Africa, Latin America, Asia</p>			
<p><i>2010</i>  <i>Material</i> (1) development of varieties of priority species in west Africa; (2) new tree varieties available in south Asia  <i>Practice:</i> (1) Development of a strategic paper on best practices on conservation and utilization of agroforestry species in the tropics  <i>Capacity:</i> (1) PhD study completed on research on indigenous fruit trees in Southern Africa</p>			

## GP3 LogFrame - Tree-based Diversification and Intensification of Smallholder Agriculture

Output 3.1 Improved agroforestry management principles, methods and options developed for improved agroforestry management, including their ecological impacts on smallholder farms			
Output Targets	Intended Users	Outcomes	Impacts
<p><b>2008</b>  <i>Other knowledge:</i> (1) Synthesis of the spatial and community factors affecting the adoption of agroforestry in Southern Africa synthesized and constraints to adoption of Agroforestry in west Africa, southern Africa and in south Asia analysed. (2) Spatial, economic and ecological challenges for tree-crop integration in tropical zones of high altitude, high population density and variable market opportunities assessed: (3) Extension materials on management of agroforestry systems developed for southern Africa and the Sahel; and on rubber and cocoa based agroforestry in south Asia.</p> <p><b>2009</b>  <i>Practice:</i> (1) Tree integration and management techniques on-farm developed in high altitudes agrarian landscapes in Central Africa.  <i>Other knowledge:</i> (1) Experiences and lessons learnt on the adoption, promotion and impact of agroforestry and natural resource management technologies in Africa synthesized and published.</p> <p><b>2010</b>  <i>Policy/Strategy:</i> (1) Briefs meetings and workshops for policy makers on strategies to promote conservation agriculture practices on small farms in West and Central Africa.  <i>Capacity:</i> (1) Extension materials on management of agroforestry systems developed on shea tree and on at least two other native fruit trees in West and Central Africa, and (2) on teak based systems in southeast Asia.</p>	<p>Researchers in NARS, ARIs and universities.</p> <p>Ministries of agriculture and natural resources and other development institutions.</p> <p>Extension systems, NGOs, CBOs and land users.</p> <p>Policy makers and funding agencies.</p>	<p>Development implementers use improved tools and knowledge to make more informed choices on integrating agroforestry into farming systems.</p> <p>Improved agroforestry principles and options for smallholder farmers will be adapted and applied by development organizations.</p>	<p>Widespread adoption of agroforestry systems that increase farm level productivity, and environmental resilience on smallholder farms.</p>
Output 3.2 Knowledge options developed for improved water productivity and use in agroforestry systems including tradeoffs at farm level.			
Output Targets	Intended Users	Outcomes	Impacts
<p><b>2008</b>  <i>Other knowledge:</i> (1) Analysis of experiences and lessons from green water harvesting from eastern and southern Africa.</p> <p><b>2009</b>  <i>Other knowledge:</i> (1) Impacts of agroforestry systems on water conservation and productivity assessed in south Asia.</p> <p><b>2010</b>  <i>Capacity:</i> (1) Technical backstopping and capacity building on conservation agriculture techniques on water conservation and productivity for national research institutions in at least three western and central African countries.</p>	<p>Researchers in NARS, ARIs, universities.</p> <p>Ministries of agriculture and natural resources and other development institutions.</p> <p>Extension systems, NGOs, CBOs and land users.</p>	<p>Development organizations and policy makers use principles and techniques for enhancing water use efficiency of trees and enhancing agroforestry development through improved water management to design more effective agroforestry development.</p>	<p>Widespread adoption of agroforestry systems that are supported by improved water harvesting methods and that increase farm level productivity and environmental resilience on smallholder farms.</p>

Output 3.3 Knowledge of opportunities developed and promoted for agroforestry to improve agricultural productivity and create greater system resilience and alternatives for income generation within smallholder farms			
Output Targets	Intended Users	Outcomes	Impacts
<p>2008</p> <p><i>Practice:</i> (1) Farmer training materials on integrated pest management for at least one tree crop species available.</p> <p><i>Other knowledge:</i> (1) Tree species suitability maps produced for at least two regions; and two journal articles produced on relationship of intra-specific diversity and tree abundance on farms.</p> <p>2009</p> <p><i>Policy/Strategy:</i> (1) Principles, models and frameworks for pest risk assessment and management developed in southern Africa and west Africa.</p> <p><i>Practice:</i> (1) Generic computer models developed for tree growth simulation in diversified systems and methods for using spatial information for agroforestry design and management.</p> <p><i>Other knowledge:</i> (1) Journal article on tree diversity and abundance of native trees and their genetic conservation on small farms.</p> <p>2010</p> <p><i>Policy/Strategy:</i> (1) Integrated management strategies developed to conserve the genetic resources for both crops and trees on-farm developed in West Africa; and (2) southeast Asia.</p> <p><i>Practices:</i> (1) Training manual for genetic resource management of native trees on-farm for the Sahel.</p> <p><i>Other knowledge:</i> (1) Journal article on tree diversity of native trees impacts on rural populations livelihoods on small farms in the Sahel.</p>	<p>Researchers in NARS, ARIs, universities.</p> <p>Ministries of agriculture and natural resources and other development institutions.</p> <p>Extension systems, NGOs, CBOs and land users.</p> <p>Policy makers.</p> <p>Managers of education and training institutions.</p>	<p>Intensification of farming systems with more productive tree-based options taken up by smallholders.</p> <p>Tree genetic resources better conserved on small farms.</p> <p>Enhanced tree diversity on farm.</p>	<p>More sustainable (minimized pest and diseases attacks) and productive farming systems on small farms contributing to alleviation of poverty and food security and protection of the environment on-farm.</p>
Output 4.1 Understanding of constraints and opportunities of agroforestry tree product market chains			
Output Targets	Intended Users	Outcomes	Impacts
<p>2008</p> <p><i>Other knowledge:</i> (1) Key market constraints and opportunities assessed at key sites</p> <p><i>Practice:</i> (1) Guidelines developed for assessing constraints and opportunities in tree product sectors</p> <p>2009</p> <p><i>Policy/Strategy:</i> (1) Policy guidelines developed for establishing enabling environments for tree products (2) Appraisal of opportunities to achieve premium value transfer between end users and ecologically certified producers without complex chain of custody mechanisms..</p> <p>2010:</p> <p><i>Practice:</i> (1) Revised guidelines based on prototype developed in 2008 are produced.</p>	<p>Community-based organisations, development agencies, extension agents, farmers, intergovernmental bodies involved in trade, international product research institutions, national and local policymakers, national product research institutions, non-government organisations, private sector, producer associations, regional bodies involved in trade</p>	<p>Marketing stakeholders making more effective decisions to promote and increase tree product marketing, provide a more enabling environment, and target the poor.</p>	<p>Better functioning tree product markets, greater access of the poor to tree product markets</p>

## GP4 LogFrame - Tree Product Markets

<b>Output 4.2 Best practices and institutional innovations for improving smallholder access to markets</b>			<b>Intended Users</b>	<b>Outcomes</b>	<b>Impacts</b>
<b>Output Targets</b>					
2008 <i>Practice:</i> (1) Guidelines for facilitating the development of seed and seedling marketing systems developed; (2) Small-level food processing and products of smallholder farmers promoted. (3) Development of regional standards of certification for Shea products in west Africa			Certification bodies, community-based organisations, development agencies, extension agents, farmers, inter-governmental bodies involved in trade, international product research institutions, national and local policymakers, national product research institutions, non-governmental organisations, private sector, producer associations, regional bodies involved in trade.	Better functioning tree product markets, increased marketing of tree products by smallholders, Smallholder farmers and poor entrepreneurs earning higher returns than previously	Reduced rural poverty, Increased internal and external trade
2009 <i>Policy/Strategy:</i> (1) Strategies for public-private partnerships to promote tree product marketing developed					
2010 <i>Practice:</i> (1) Best practices for improving the participation of poor and women smallholders and entrepreneurs in agroforestry tree product enterprises developed <i>Other Knowledge:</i> (1) Ziziphus fruit quality analyses published					
<b>Output 4.3 Capacity enhancement for improved smallholder tree product market chains</b>					
<b>Output Targets</b>					
2008 <i>Capacity:</i> (1) Capacity of private sector partners increased to process medicinal tree products; (2) Strategies for improving the capacity of national farmer associations institutions to promote tree products designed and implemented			community-based organisations, development agencies extension agents, farmers, inter-governmental bodies involved in trade, international product research institutions, national and local policy makers, national product research institutions, non-governmental organisations, private sector, producer associations, regional bodies involved in trade.	Increased governmental support for tree product marketing, increased marketing of tree products by smallholders, Smallholder farmers and poor entrepreneurs earning higher returns than previously.	Reduced rural poverty, Increased internal and external trade
2009 <i>Capacity:</i> (1) Africa Tree Product Platform operational; (2) training materials/tools developed to train partners' in community based- enterprises development					
2010 <i>Capacity:</i> (1) Capacity of local and national policy makers to improve promote tree product marketing developed					

## GP5 LogFrame - Agroforestry in multifunctional landscapes: tradeoffs and synergies

Output 5.1 Dynamic tradeoff models (based on empirical studies) for 'goods' (for subsistence and markets) and 'services' (carbon stocks, biodiversity indicators and quantifiable watershed functions) from multifunctional landscapes with trees			
Output Targets	Intended Users	Outcomes	Impacts
<p>2008  <i>Other knowledge:</i> (1) Publication of Fallow model (dynamic landscapes) validation for case studies in SE Asia and web availability of new version and supporting databases. (2) Publication of tested quantitative indicators for landscape level watershed functions, to be used in dynamic tradeoff models for landscape mosaics with trees.  <i>Capacity:</i> (1) Research partners trained in at least 5 countries for next round to test.</p> <p>2009  <i>Practice:</i> (1) Use of indicators and tools in context of spatial planning and rewards for environmental services (interface with GP8).  <i>Other knowledge:</i> (1) Test results of biodiversity platform hypotheses.  <i>Capacity:</i> Wider testing and improvement (re-construction if needed) in context of 'avoided deforestation with sustainable benefits' case studies (with GP11).</p> <p>2010  <i>Practice:</i> (1) Use and development of tools in other regions.  <i>Other knowledge:</i> (1) Publications based on cross-regional comparison.</p>	<p>Researchers and policy analysts for local resource managers</p>	<p>Local resource managers in multi-use landscapes with trees use cost-effective, replicable tools and approaches to appraise the likely impacts of changes in land use on watershed functions, biodiversity and carbon stocks, as well as on economic productivity of the landscape.</p>	<p>Realistic use of trees for transforming lives and landscapes and MDG attainment</p>
Output 5.2 Rapid appraisal tools for biodiversity, watershed functions and carbon stocks at landscape scale that support multistakeholder dialogue on options for increase or change in the tree presence and (agro)forest cover in the landscape			
Output Targets	Intended Users	Outcomes	Impacts
<p>2008  <i>Practice:</i> (1) Improved (2<sup>nd</sup> generation) methods for rapid hydrological, carbon and agrobiodiversity appraisal available on website, along with documented case studies and partnership capacity building in Asia.  <i>Other knowledge:</i> (1) Syntheses of first round of application of the appraisal methods published.</p> <p>2009  <i>Other knowledge:</i> (1) Synthesis on use of locally adapted indicators for landscape-scale monitoring and learning.  <i>Capacity:</i> (1) Application of the methods in about 10 new case studies, resulting in method improvement.</p> <p>2010  <i>Capacity:</i> (1) further use and development of tools in other regions.</p>	<p>Researchers, and intermediaries in negotiation support and RES (Rewards for Environmental Services) mechanisms             Institutions building capacity for reduced transaction costs in wider application of RES.</p>	<p>Local resource managers in multi-use landscapes with trees use cost-effective, replicable tools and approaches to appraise the likely impacts of changes in land use on watershed functions, biodiversity and carbon stocks, as well as on economic productivity of the landscape.</p>	<p>Realistic use of trees for transforming lives and landscapes and MDG attainment.</p>

<b>Output 5.3 Learning landscapes (and IPGs derived from them) with long term analysis of change and experiments with modification of incentive systems for enhancing the role of multifunctional agroforestry systems in avoided deforestation for climate change mitigation, watershed protection and biodiversity conservation</b>			
<b>Output Targets</b>	<b>Intended Users</b>	<b>Outcomes</b>	<b>Impacts</b>
<p>2008 <i>Other knowledge</i> (1) Analysis of carbon storage – economic growth tradeoff in the past decade for at least 3 of the ASB benchmark areas (with GP7); (2) Synthesis of the lessons learnt in the first phase of RUPES-I in Asia with respect to enhancement of environmental services</p> <p>2009 <i>Other knowledge:</i> (1) Tests of new forms of outcome based rewards for environmental services, grounded in local monitoring and resource management, rather than input control</p> <p><i>Capacity:</i> (1) Effective use of the learning landscapes for new forms of capacity building</p> <p>2010 <i>Other knowledge:</i> (1) Synthesis of experience across PRESA (Africa), RUPES (Asia) and the landscapes of the CIFOR/WorldAgroforestry biodiversity platform project</p>	<p>Researchers</p> <p>Participants in global policy debates</p> <p>Local resource managers and supporting agents</p>	<p>Local resource managers in multi-use landscapes with trees use cost-effective, replicable tools and approaches to appraise the likely impacts of changes in land use on watershed functions, biodiversity and carbon stocks, as well as on economic productivity of the landscape</p>	<p>Realistic use of trees for transforming lives and landscapes and MDG attainment</p>

## GP6 LogFrame - Agroforestry for Land Rehabilitation

<b>Output GP.6.1 Land and soil degradation assessment methods and empirical results generated</b>			
<b>Output Targets</b>	<b>Intended Users</b>	<b>Outcomes</b>	<b>Impacts</b>
<p>2008 <i>Policy/Strategy:</i> (1) Land assessment component of Oasis Challenge Programme concept developed.</p> <p><i>Practice:</i> (1) Land health surveillance framework for evidence-based diagnosis, testing and targeting of land rehabilitation interventions developed and disseminated.</p> <p><i>Other knowledge:</i> (1) Multiscale assessment results and electronic atlases on land degradation and soil infrared spectral indices for West Africa Sahel.</p> <p><i>Capacity:</i> (1) Technical backstopping and capacity building on land health surveillance methods for TerrAfrica, FAO Integrated Natural Resources Assessment (Kenya), UNDP development programmes (Kenya), and national programmes in Kenya, Mali, and Mozambique.</p> <p>2009 <i>Practice:</i> (1) Training module and guidelines on land health surveillance and use of infrared spectroscopy for rapid diagnosis for soil and crop health developed and disseminated.</p> <p><i>Other knowledge:</i> (1) Soil health surveillance system for sub-Saharan Africa initiated and preliminary data generated for east Africa; (2) Online catalogue of metadata, data and interpretation standards for WorldAgroforestry global soil spectral library.</p> <p><i>Capacity:</i> (1) Technical backstopping and capacity building on land health surveillance methods for national programmes in east, southern and west Africa.</p> <p>2010 <i>Other knowledge:</i> (1) Spectral pedotransfer models for soil physical properties, carbon, micronutrients and fertility capability for Sub-Saharan Africa soils.</p>	<p>Government policy makers, UN agencies, and funding agencies</p> <p>Scientists at national, international research institutes</p> <p>Development organizations</p>	<p>Governments, UN agencies and funding agencies aware of benefits of land health surveillance approaches</p> <p>Researchers use improved methods for land degradation and soil quality assessment</p> <p>Development implementers use improved tools and knowledge to make informed choices on improving land management</p>	<p>Adoption of agroforestry systems that are better targeted to specific land degradation problems.</p>

Output GP.6.2 Decision-support tools for targeting agroforestry based land rehabilitation developed and applied			
Output Targets	Intended Users	Outcomes	Impacts
<p>2008</p> <p><i>Policy/Strategy:</i> (1) Concept for an evidence-based decision support system for targeting agroforestry options for land rehabilitation developed and illustrated for rehabilitation of Sahelian tree-crop-livestock systems.</p> <p><i>Practice:</i> (1) Lessons learnt from national reforestation efforts in Asia.</p> <p><i>Other knowledge:</i> (1) Meta-analysis of empirical data on agroforestry-based soil rehabilitation in African maize systems; (2) Tree Soil Crop model for rehabilitating hillslopes in SE Asia.</p> <p>2009</p> <p><i>Policy/Strategy</i> (1) Strategy for priority investments for scaling up improved soil health management in Africa.</p> <p><i>Other knowledge:</i> (1) Prototype of evidence-based decision support system and principles for matching agroforestry options to land degradation problems and soil constraints developed; (2) Global synthesis on agroforestry options for land rehabilitation.</p> <p>2010</p> <p><i>Practice:</i> (1) Guidelines for sustainable rehabilitation and enrichment of degraded landscapes developed and disseminated.</p> <p><i>Other knowledge:</i> (1) Evidenced-based decision support system for matching agroforestry options to land degradation problems and soil constraints applied.</p>	<p>Government policy makers, UN organizations and international donors</p> <p>Scientists at national, international research institutes</p> <p>Development organizations Extension systems</p>	<p>Evidence-based and management principles and spatially-explicit strategies are used to steer land management research and development programmes</p> <p>National scientists better target agroforestry based land management options to specific land degradation problems</p> <p>Improved agroforestry based land and soil management options applied and adapted by development organizations</p>	<p>Adoption of agroforestry systems that lead to rehabilitation of land and improved soil productivity and sustainability in agricultural landscapes.</p>

## GP7 LogFrame – Agroforestry for Climate Change Adaptation and Mitigation

Output 7.1 Tools developed for carbon sequestration project managers			
Output Targets	Intended Users	Outcomes	Impacts
<p>2008</p> <p><i>Practice:</i> (1) Carbon measurement and monitoring system produced</p> <p>2009</p> <p><i>Practice:</i> (1) Full toolbox for carbon sequestration project design</p> <p>2010</p> <p><i>Practice:</i> (1) Revised carbon measurement system and project developers toolbox.</p> <p><i>Other knowledge:</i> (1) Toolkit published</p> <p><i>Capacity:</i> (1) Enhanced capacity of developing country partners in carbon sequestration project development.</p>	<p>Project developers National agencies in charge of climate change projects NGOs and POs Researchers in developing countries</p>	<p>More C sequestration projects</p> <p>Greater farmer's income from carbon credits</p>	<p>Improved adaptation of small holder farmers to climate variability</p> <p>Improved land management</p> <p>Mitigation of greenhouse gasses in the atmosphere</p>

<b>Output 7.2 A Methods built for assessment of climate change impacts on biogeochemical processes and water relations</b>			
<b>Output Targets</b>	<b>Intended Users</b>	<b>Outcomes</b>	<b>Impacts</b>
2008 <i>Other knowledge:</i> (1) Peer-reviewed paper published	Scientific community, the Intergovernmental Panel on Climate Change and other UNFCCC bodies.	Better understanding of how climate change will impact N cycle in N limited soils and how water relations will change as a result of climate change.	Ultimately, more climate proof agroforestry systems based on a mechanistic understanding of climate change impacts.
2009 <i>Other knowledge:</i> (1) Peer-reviewed paper			
2010			
<b>Output 7.3 Policy communications on avoided deforestation, afforestation and reforestation</b>			
<b>Output Targets</b>	<b>Intended Users</b>	<b>Outcomes</b>	<b>Impacts</b>
2008 <i>Policy/Strategy:</i> (1) Avoided deforestation, costs of mitigation in agricultural sector	Climate policy makers, particularly members of G77/China negotiating block  NGOs engaged in the UNFCCC process  Small farmers who live in forests edge	Better policy decisions on mitigation of climate change	Improved opportunities for small scale farmers to protect and conserve forests, greater international attention on the impacts of climate change on the agricultural sector.
2009 <i>Policy/Strategy:</i> (1) Avoided deforestation, Afforestation and reforestation.			
2010 <i>Policy/Strategy:</i> (1) Avoided deforestation, Afforestation and reforestation.			
<b>Output 7.4 Climate change adaptation options available for smallholder farmers</b>			
<b>Output Targets</b>	<b>Intended Users</b>	<b>Outcomes</b>	<b>Impacts</b>
2008 <i>Practice:</i> (1) Recommended practices and strategies for climate change adaptation. <i>Other knowledge:</i> (1) Documentation of farmer's adaptation to climate variability on Asia. <i>Capacity:</i> (1) Enhanced farmer's capacity to cope with climate risks.	Agroforestry farmers in developing countries National development agencies Researchers Managers of international adaptation funds (eg World Bank)	Local knowledge on climate risk adaptation documented and used as basis for climate change adaptation practices and strategies.  Policy constraints and options identified for mainstreaming climate change adaptation in agriculture and NRM development.	Small farmers better able to adapt to current and future climate.  Greater and more effective funding support for climate change adaptation by small farmers.  Climate change adaptation "mainstreamed" in agriculture and NRM projects.
2009 <i>Policy/Strategy:</i> (1) Options for mainstreaming climate change in agriculture and natural resources management (NRM). <i>Other knowledge:</i> (1) Peer-reviewed paper on climate change adaptation. <i>Capacity:</i> (1) Enhanced capacity of farmers to cope with climate risks.			
2010 <i>Practice:</i> (1) Recommended options for climate change adaptation updated . <i>Other knowledge:</i> (1) Climate change adaptation primer for farmers and NRM managers.			

## GP8 Logframe - Policy options and incentive mechanisms for strengthening agroforestry

Output 8.1 Action research, assessments and syntheses of policy options that can strengthen land and tree tenure rights and agroforestry incentives for smallholder farmers.		
Output Targets	Intended Users	Impact
<p><b>2008</b> <i>Other knowledge:</i> (1) An edited volume on CGIAR research on by-laws affecting Natural Resource Management in Africa.</p> <p><b>2009</b> <i>Other knowledge:</i> (1) Assessments of agroforestry practices in community reserves and conservation concessions in Central Africa.</p> <p><b>2010</b> <i>Practices:</i> (1) Tools for negotiating land and tree property rights developed and applied in four countries in West Africa. <i>Policies/Strategies:</i> (1) Land use zoning and design plan with designated agroforestry development zone is developed for a landscape in Central Africa.</p>	Environmental management agencies, non-governmental organizations, researchers, local government agencies	Successful environmental service mechanisms implemented in a range of sites across Africa, Asia and Latin America.  Critical ecosystem services maintained and farmer welfare enhanced in the selected sites in Africa, Asia and Latin America.
<p><b>Output 8.2 Pilot studies, syntheses, and tools for designing mechanisms that recognize, compensate and reward smallholders for providing local, national and global environmental services through appropriate agroforestry strategies.</b></p>		
Output Targets	Intended Users	Impact
<p><b>2008</b> <i>Other knowledge:</i> (1) Book or special issue summarizing results of a pantropical scoping study of compensation and rewards for environmental services. <i>Capacity:</i> (1) Researchers from across Africa are trained in tools and modeling approaches for assessing the prospects for rewards for watershed and biodiversity rewards.</p> <p><b>2009</b> <i>Practices:</i> (1) Technology advisory tool developed for guiding the selection of appropriate agroforestry and conservation agriculture technologies in the East African highlands. <i>Policies/Strategies:</i> (1) Series of publications on the role of RUPES as a boundary organization that links knowledge and practice.</p> <p><b>2010</b> <i>Policies/Strategies:</i> (1) Prototype reward mechanisms implemented in at least 3 sites in the East African highlands and 3 sites in Asia. (2) Policy options to facilitate conditional rewards for environmental services are developed with policy makers in Africa and Asia.</p>	Environmental management agencies, non-governmental organizations, researchers, local government agencies	Successful environmental service mechanisms implemented in a range of sites across Africa, Asia and Latin America.  Critical ecosystem services maintained and farmer welfare enhanced in the selected sites in Africa, Asia and Latin America.

**Output 8.3 Syntheses, policy studies, policy options and support to developing country negotiators on how multilateral environmental agreements, regional agreements, and national action plans can be modified to enhance the contributions of agroforestry.**

<b>Output Targets</b>	<b>Intended Users</b>	<b>Outcome</b>	<b>Impact</b>
<p>2008 <i>Policies/Strategies:</i> (1) Emission abatement costs functions estimated for contrasting sites in the tropical forest margins and the implications communicated to national policy makers and the UNFCCC processes. (2) Policy advice provided to national and local policy makers on how to facilitate environmental service agreements.</p> <p>2009 <i>Policies/Strategies:</i> (1) The concerns and interests of agroforestry producer groups are brought into important agriculture and environment policy processes in Southern Africa.</p> <p>2010 <i>Policies/Strategies:</i> (1) At least one avoided deforestation pilot study designed and implementation begun.</p>	<p>Negotiators for multilateral environmental agreements; planners for regional environmental plans (e.g. NePAD); Environmental Facility; regional organizations; international policy shapers (e.g. World Bank, IUCN)</p>	<p>International and regional conventions, agreements and action plans are modified to better facilitate the contributions of smallholder farmers practicing agroforestry.</p>	<p>Enhanced tree planting and management in conjunction with the implementation of international and regional environmental agreements.</p>

**GP9 LogFrame - Strengthening Agroforestry Institutions and Learning tools for Linking Knowledge to Action**

<b>Output 9.1 Knowledge gathered and generated on institutional challenges and needs for the advancement of agroforestry</b>			
<b>Output Targets</b>	<b>Intended Users</b>	<b>Outcomes</b>	<b>Impacts</b>
<p>2008 <i>Other knowledge:</i> (1) Tools for characterizing Agroforestry readiness of research and development institutions, and boundary issues; (2) Learning-competency matrix of different stakeholders involved in developing and managing Agroforestry programmes; (3) Analysis of successful cases of organizations that link knowledge to action in INRM as basis of good practice guides and learning tools <i>Policies/Strategies:</i> (1) Policy brief on incorporating agroforestry in university programmes in SE Asia.</p> <p>2009 <i>Policies/Strategies:</i> (1) Policy brief on the Agroforestry needs of rural agricultural organizations; (2) Policy brief on institutionalizing agroforestry in agricultural research institutions in Francophone west Africa.</p> <p>2010 <i>Policies/Strategies:</i> (1) A common strategy paper for integrating natural resource sciences at research and training institutions. <i>Other knowledge:</i> (1) Diagnosis of agroforestry content in global and regional instruments agreements and protocols.</p>	<p>Policy makers at all levels, institutional managers, planners.</p>	<p>Improved understanding, increased integration of tree-based land use (agroforestry) into various policies and other instruments Policy makers recognize complex landscape functions and incorporate the knowledge in decision making especially on institutions</p>	<p>A contribution to the global growth in scientific research and innovation in Agroforestry Agroforestry incorporated in developments plans and actions</p>

<b>Output 9.2 Policies, learning tools and partner institutional capacity developed for the advancement of agroforestry science, innovation and practice.</b>			
<b>Output Targets</b>	<b>Intended Users</b>	<b>Outcomes</b>	<b>Impacts</b>
<p><b>2008</b>  <i>Knowledge:</i> (1) Characterization and typology of effective agroforestry knowledge to action programmes; gender roles.  <i>Practice:</i> (1) Landcare principles and processes: Practitioner's Guide; (2) Learning materials and curriculum guide on landscape agroforestry in 5 languages in SE Asia.</p> <p><b>2009</b>  <i>Other knowledge:</i> (1) Databases on Agroforestry and landcare-type institutions.  <i>Practice:</i> (1) tool for quality assessment of AF learning programmes.  <i>Policies/Strategies:</i> (1) synthesis on instructional design for on-line AF learning resources.</p> <p><b>2010</b>  <i>Practices:</i> (1) Models for agroforestry research programmes and curricula;  (2) Learning and applying agroforestry innovations: field guide to boundary organizations in Southeast Asia and Africa; (3) Manual on principles for institutionalizing agroforestry.</p>	<p>Learning and research institutions, Prospective students, industry, government ministries and private sector</p>	<p>Production and better utilization of competent graduates with skills and knowledge to integrate systems. Employers sources competent graduates</p> <p>Improved learning and research quality</p>	<p>Quality advice informs and improves farming and agricultural business enterprises.</p> <p>Greater interest in agroforestry innovations</p>
<b>Output 9.3 Strategies and networks for enhancing and managing Agroforestry knowledge</b>			
<b>Output Targets</b>	<b>Intended Users</b>	<b>Outcomes</b>	<b>Impacts</b>
<p><b>2008</b>  <i>Capacity:</i> (1) 20 graduate students complete their thesis research; (2) Taskforces formed to establish national Agroforestry research programmes in 4 Latin American countries  <i>Practices:</i> (1) Tools to assess the impact of linking institutions and professions for promoting market-led agroforestry production in ECA region</p> <p><b>2009</b>  <i>Capacity:</i> (1) 2 PhD and 15 MSc graduates and 10 faculty trained in Africa and Asia; (2) SEANAFE registered as an international NGO supporting agric (3) NIRM education and CGIAR training community meeting to produce system strategy</p> <p><b>2010</b>  <i>Practice:</i> (1) repository of relevant teaching and learning materials on natural resource management targeting young people and educators in sub-Saharan Africa; (2) Inter-institutional training mechanisms for AF established for the south Asia region.  <i>Capacity:</i> (1) SEANAFE registered as an independent international network</p>	<p>Managers of research, education and training institutions, ministries responsible for agriculture and land use, researchers, educators, farmers, international research bodies, NGOs</p>	<p>Institutions actively apply integrative principles in the design of research education and development programmes</p>	<p>Overall growth of capacity for integrative management of agriculture and natural resources.</p> <p>Improved on-farm productivity and better functioning and sustainable farming landscapes</p>

## GP10 LogFrame – African Highlands Initiative

<b>Goal 1:</b> To develop and promote demand-driven INRM innovations at watershed and district levels.				
<b>Output AHI 1.1 Pilot Implementation of Integrated Watershed R&amp;D Interventions</b>				
<b>Output Targets</b>	<b>Intended Users</b>	<b>Outcomes</b>	<b>Impacts</b>	
<p><b>2008</b>  <i>Practice:</i> (1) Methods and guidelines for negotiation support and ecosystem assessment developed.  <i>Capacity:</i> (1) Environmental stewards in 4 landscapes empowered in ecosystem management.</p> <p><b>2009</b>  <i>Policy/ strategies:</i> (1) Strategy for addressing “intractable” challenges and leveraging on identified opportunities at community/ landscape level designed.</p>	Government ministries; NGOs; research institutes; CBOs and private sector	Communities in highland areas have increased income and optimized yields from diverse farm components while conserving system nutrients, water and biodiversity Highland communities acquire an increased role in ecosystem stewardship	(i) More integrated management of natural resources (soil, crops, livestock, water, trees); (ii) More sustainable production; (iii) More income and food and reduced vulnerability of rural households; (iv) Stabilized or increased provision of environmental services.	
<p><b>2010</b>  <i>Strategies:</i> (1) Strategy for disseminating AHI innovations into new areas tested and developed.</p>				
<b>Output AHI 1.2 Pilot Implementation of District Institutional Innovations for INRM</b>				
<b>Output Targets</b>	<b>Intended Users</b>	<b>Outcomes</b>	<b>Impacts</b>	
<p><b>2008</b>  <i>Policy/ strategies:</i> (1) Strategies for inducing change in district institutional arrangements, policies and key decision-makers designed and implemented.  <i>Capacity:</i> (1) District level actors trained in cross-sectoral coordination approaches for INRM</p> <p><b>2009</b>  <i>Policy/ Strategies:</i> (1) New strategies towards facilitating district level innovation platforms using the Landcare approach designed and implemented.  <i>Other knowledge</i> (1) Lessons from pilot district level institutional innovations action research identified.</p> <p><b>2010</b>  <i>Policies/strategies:</i> (1) Strategy for linking District level innovations and institutional arrangements in INRM to national and regional level process</p>	NARIs, NGOs, government ( local and National) , regional level organizations and the private sector	(i) Increased cooperation amongst district level partners ( CBOs, NGOs, Local government) and National level partners( NARS, Environmental agencies, central government) are cooperating with one another in empowering communities for effective INRM (ii) Community members able to monitor, evaluate, negotiate, and link with outside actors to advocate for their interests in INRM. (iii) District level initiatives link with National level programmes and institutions for support (iv) Regional level organizations use lessons and experiences for planning	(i) More integrated management of natural resources for optimal returns from land and investments (income, food, water, fuel and marketable products); (ii) Improved capacity of and coordination among district R&D institutions; (iii) Better targeted technologies and higher rates of adoption of NRM technologies; (iv) Reduced conflict and vulnerability through improved governance of development processes and the environment; (v) More effective institutional arrangements for INRM, scaling up and community mobilization.	

<b>Goal 2:</b> To enable more widespread impact from INRM through analysis, documentation and dissemination of lessons and methods, and increased institutional investment and change among R&D organizations.			
<b>Output AHI 2.1 Institutional Change in Support of INRM</b>			
<b>Output Targets</b>	<b>Intended Users</b>	<b>Outcomes</b>	<b>Impacts</b>
<p>2008  <i>Other knowledge:</i> (1) lessons from capacity building and technical backstopping on the use of INRM methods in new sites and countries distilled and documented; (2) lessons learned in institutionalization of INRM methods in east Africa documented for further application.  <i>Capacity:</i> (1) INRM partnerships and/or consortia to research diverse institutional models for institutionalizing INRM in 3 additional countries formed</p> <p>2009  <i>Practices:</i> (1) Principles and practices of institutional change developed and distributed to R&amp;D partners in the region.  <i>Policies/Strategies:</i> (1) Strategy to foster linkages across INRM processes and institutions at different scales developed (e.g. at district, national, regional and international)</p> <p>2010  <i>Policies/Strategies:</i> (1) INRM is mainstreamed into the governance agenda at national and regional levels.</p>	<p>Research and development organizations (NARIs, NGOs, extension organizations, local government, universities) and regional bodies</p>	<p>(i) Improved capacity of NARIs, NGOs, extension personnel and government employees to integrate INRM methods into everyday practice;  (ii) Staff from research, development and educational institutions supported through organizational structures, processes and technical support services in the application of INRM principles and methods.  (iii) Tailor made methods available for policy makers.</p>	<p>More widespread impact (as specified in <i>Outputs 1.1 and 1.2</i>) from institutionalization of INRM approaches within national and regional R&amp;D organizations and partnerships.</p>
<b>Output AHI 2.2 Knowledge Management</b>			
<b>Output Targets</b>	<b>Intended Users</b>	<b>Outcomes</b>	<b>Impacts</b>
<p>2008  <i>Capacity:</i> (1) At least 20 final knowledge and training products produced for identified target groups (farmers, research and development practitioners, policy makers).</p> <p>2009  <i>Practices:</i> (1) Lessons and methods guides on institutionalizing INRM and the Landcare approach published in form of an issue book and disseminated.  <i>Policy/strategies:</i> (1) Strategy for enhancing knowledge management and communication in INRM in the region developed.</p> <p>2010  <i>Policy/strategies:</i> (1) for identifying partners of choice in scaling up of INRM developed and implemented.</p>	<p>Research, development and educational institutions  Practitioners at national, regional and global levels.</p>	<p>(i) Increased awareness and application of the principles and practice of INRM among R&amp;D organizations and professionals in the ECA region and beyond (ii) Attitude change illustrated by a more robust system of implementation in R&amp;D amongst target institutions, organizations and networks.</p>	<p>More widespread regional and global impact (as in <i>Outputs 1.1 and 1.2</i>) of INRM from improved knowledge management (<i>monitoring, documentation, synthesis, analysis and dissemination of lessons and methods from pilot sites and projects</i>), technical support and networking.</p>

## GP11 LogFrame – ASB Partnership for the Tropical Forest Margins

Output ASB.1 Improved understanding of tradeoffs and response options			
Output Targets	Intended Users	Outcomes	Impacts
<p>2008  <i>Other Knowledge:</i> (1) Carbon emission abatement functions and conditioning factors estimated for ASB sites in Africa, Asia and Latin America.</p> <p>2009  <i>Policies/Strategies:</i> (1) New methods for baseline assessment and monitoring of landscape-level carbon stocks tested in ASB sites.</p> <p>2010  <i>Knowledge:</i> (1) Tradeoff analyses published for a new set of ASB sites, including pilot sites for Reduced Emissions from Deforestation.</p>	<p>National and international researchers.</p> <p>UN agencies, donors, national environment agencies, UNFCCC negotiators</p>	<p>Researchers working at the tropical forest margins conduct research that is more effective and better linked to important policy processes.</p> <p>Workable organizational structures and processes identified and implemented that link integrative science with policy and practice in the search for better approaches to poverty reduction, natural resource management, and rainforest conservation.</p> <p>Policy makers at the national and international scales adopt policies, negotiation processes and institutions that reduce incentives for deforestation.</p>	<p>Appreciable slowing in the rate of tropical deforestation in countries that consider ASB outputs in the design of policies, incentive systems and negotiation approaches.</p> <p>Smallholder farmers living in the tropical forest margins have more secure land rights and incentives to undertake investments and land uses consistent with essential environmental services.</p>
Output ASB.2 Synthesis and projection into policy processes			
Output Targets	Intended Users	Outcomes	Impacts

<p>2008 Capacity: (1) analysis of the costs and appropriate policy instruments for carbon emission abatement is made available to the Climate Change negotiation processes (with GP7).</p>	<p>National and international researchers. UN agencies, donors, national environment agencies, UNFCCC negotiators</p>	<p>Researchers working at the tropical forest margins conduct research that is more effective and better linked to important policy processes. Workable organizational structures and processes identified and implemented that link integrative science with policy and practice in the search for better approaches to poverty reduction, natural resource management, and rainforest conservation. Policy makers at the national and international scales adopt policies, negotiation processes and institutions that reduce incentives for deforestation.</p>	<p>Appreciable slowing in the rate of tropical deforestation in countries that consider ASB outputs in the design of policies, incentive systems and negotiation approaches. Smallholder farmers living in the tropical forest margins have more secure land rights and incentives to undertake investments and land uses consistent with essential environmental services.</p>
<p>2009 Other Knowledge: (1) Edited book on the potential for Reduced Emissions from Deforestation on the basis of the experience for ASB sites. 2010 Capacity: (1) Adoption of best practices in the ASB sites nationally, regionally and globally. (2) Development and diffusion of new organizational learning and change processes that link integrative science with policy and practice in the search for better approaches to Reduced Emissions from Deforestation and forest Degradation (REDD)</p>			
<p><b>Output ASB.3 Networking and capacity building</b></p>			
<p><b>Output Targets</b> 2008 Capacity: (1) A new governance structure for ASB is developed that provides for a broader membership, with greater inputs from experts in key issues, and a clear understanding of the value added of ASB at the national, regional and international levels. 2009 Capacity: (1) The new governance structure for ASB is operational and defines a new set of priorities and working relations. 2010 Capacity: (1) Strengthened capacity of ASB partners to lead and sustain their own programmes of integrated assessment, research, development, fundraising, communication, education and action for climate change negotiation processes.</p>	<p><b>Intended Users</b> National and international researchers. UN agencies, donors, national environment agencies, UNFCCC negotiators</p>	<p><b>Outcomes</b> Researchers working at the tropical forest margins conduct research that is more effective and better linked to important policy processes. Workable organizational structures and processes identified and implemented that link integrative science with policy and practice in the search for better approaches to poverty reduction, natural resource management, and rainforest conservation. Policy makers at the national and international scales adopt policies, negotiation processes and institutions that reduce incentives for deforestation.</p>	<p><b>Impacts</b> Appreciable slowing in the rate of tropical deforestation in countries that consider ASB outputs in the design of policies, incentive systems and negotiation approaches. Smallholder farmers living in the tropical forest margins have more secure land rights and incentives to undertake investments and land uses consistent with essential environmental services.</p>



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# Financial Tables



## Financial Tables

**WorldAgroforestry Table 1: Allocation of Project Costs by CGIAR System Priority Area and Priorities in 2008 in millions of US \$**

Project	Priority Area 1	Priority Area 2				Priority Area 3		Priority Area 4			Priority Area 5				Total
	1B	2A	2C	2D	3A	3D	4A	4C	4D	5A	5B	5C	5D		
GP1					0.124	0.869	0.124		0.124		0.124	0.124	0.993	2.482	
GP10		0.055	0.055		0.055		0.055	0.055	0.220	0.165		0.330	0.110	1.100	
GP11							0.342				0.146			0.488	
GP2	0.786			1.965	0.393		0.196						0.589	3.929	
GP3						0.435		0.580					0.436	1.451	
GP4					1.329	1.164					0.332		0.498	3.323	
GP5						0.552	1.104		0.552					2.208	
GP6							1.168		1.751					2.919	
GP7						0.402	1.339		0.937					2.678	
GP8							3.396	0.485				0.970		4.851	
GP9						0.198	0.197			1.969			1.574	3.938	
<b>Total</b>	<b>0.786</b>	<b>0.055</b>	<b>0.055</b>	<b>1.965</b>	<b>1.901</b>	<b>3.620</b>	<b>7.921</b>	<b>1.120</b>	<b>3.584</b>	<b>2.134</b>	<b>0.602</b>	<b>1.424</b>	<b>4.200</b>	<b>29.367</b>	

**WorldAgroforestry Table 2: Cost Allocation of Resources by CGIAR System Priority from 2006 – 2010 in millions of US \$**

Priorities	Actual 2006	Estimated 2007	Proposal 2008	Plan 1 2009	Plan 2 2010
1B	0.819	1.105	0.786	0.824	0.841
2A	0.086	0.052	0.055	0.058	0.059
2C	0.086	0.052	0.055	0.058	0.059
2D	2.047	2.763	1.965	2.063	2.102
3A	2.008	2.090	1.901	1.997	2.034
3D	3.773	4.612	3.620	3.800	3.871
4A	8.343	7.574	7.921	8.315	8.474
4C	1.195	1.149	1.120	1.177	1.199
4D	3.853	3.421	3.584	3.764	3.836
5A	2.306	1.398	2.134	2.240	2.283
5B	0.824	0.875	0.602	0.807	0.823
5C	1.654	1.346	1.424	1.495	1.523
5D	4.261	4.686	4.200	4.237	4.319
<b>Total</b>	<b>31.255</b>	<b>31.123</b>	<b>29.367</b>	<b>30.835</b>	<b>31.423</b>

**World Agroforestry Table 3: Project Cost Summary from 2006-2010 in millions of US \$**

Project	Actual 2006	Estimated 2007	Proposal 2008	Plan 1 2009	Plan 2 2010
GP1	2.585	4.812	2.482	2.606	2.656
GP10	1.713	1.040	1.100	1.155	1.177
GP11	0.586	0.555	0.488	0.512	0.522
GP2	4.093	5.526	3.929	4.125	4.204
GP3	1.511	1.753	1.451	1.524	1.553
GP4	3.461	3.111	3.323	3.489	3.555
GP5	2.320	3.396	2.208	2.318	2.363
GP6	3.041	2.217	2.919	3.065	3.123
GP7	2.790	2.266	2.678	2.812	2.865
GP8	5.053	3.964	4.851	5.094	5.191
GP9	4.102	2.483	3.938	4.135	4.214
<b>Total</b>	<b>31.255</b>	<b>31.123</b>	<b>29.367</b>	<b>30.835</b>	<b>31.423</b>

**World Agroforestry-Table 4: Allocation of Project Costs to CGIAR Priorities from 2006 to 2010 in millions of US \$**

Projects Priorities	Actual 2006	Estimated 2007	Proposal 2008	Plan 1 2009	Plan 2 2010
<b>GP1</b>					
3A	0.129	0.241	0.124	0.130	0.133
3D	0.906	1.684	0.869	0.913	0.929
4A	0.129	0.241	0.124	0.130	0.133
4D	0.129	0.241	0.124	0.130	0.133
5B	0.129	0.241	0.124	0.130	0.133
5C	0.129	0.241	0.124	0.130	0.133
5D	1.034	1.923	0.993	1.043	1.062
<b>Total Project</b>	<b>2.585</b>	<b>4.812</b>	<b>2.482</b>	<b>2.606</b>	<b>2.656</b>
<b>GP2</b>					
1B	0.819	1.105	0.786	0.824	0.841
2D	2.047	2.763	1.965	2.063	2.102
3A	0.409	0.553	0.393	0.413	0.420
4A	0.204	0.276	0.196	0.206	0.210
5D	0.614	0.829	0.589	0.619	0.631
<b>Total Project</b>	<b>4.093</b>	<b>5.526</b>	<b>3.929</b>	<b>4.125</b>	<b>4.204</b>
<b>GP3</b>					
3D	0.453	0.526	0.435	0.457	0.466
4C	0.604	0.701	0.580	0.610	0.621
5D	0.454	0.526	0.436	0.457	0.466
<b>Total Project</b>	<b>1.511</b>	<b>1.753</b>	<b>1.451</b>	<b>1.524</b>	<b>1.553</b>

<b>Projects Priorities</b>	<b>Actual 2006</b>	<b>Estimated 2007</b>	<b>Proposal 2008</b>	<b>Plan 1 2009</b>	<b>Plan 2 2010</b>
<b>GP4</b>					
3A	1.384	1.244	1.329	1.396	1.422
3D	1.211	1.089	1.164	1.221	1.244
5B	0.519	0.467	0.332	0.523	0.533
5D	0.347	0.311	0.498	0.349	0.356
<b>Total Project</b>	<b>3.461</b>	<b>3.111</b>	<b>3.323</b>	<b>3.489</b>	<b>3.555</b>
<b>GP5</b>					
3D	0.580	0.849	0.552	0.580	0.591
4A	1.160	1.698	1.104	1.158	1.181
4D	0.580	0.849	0.552	0.580	0.591
<b>Total Project</b>	<b>2.320</b>	<b>3.396</b>	<b>2.208</b>	<b>2.318</b>	<b>2.363</b>
<b>GP6</b>					
4A	1.217	0.887	1.168	1.226	1.249
4D	1.824	1.330	1.751	1.839	1.874
<b>Total Project</b>	<b>3.041</b>	<b>2.217</b>	<b>2.919</b>	<b>3.065</b>	<b>3.123</b>
<b>GP7</b>					
3D	0.418	0.340	0.402	0.422	0.430
4A	1.395	1.133	1.339	1.406	1.432
4D	0.977	0.793	0.937	0.984	1.003
<b>Total Project</b>	<b>2.790</b>	<b>2.266</b>	<b>2.678</b>	<b>2.812</b>	<b>2.865</b>
<b>GP8</b>					
4A	3.537	2.775	3.396	3.566	3.634
4C	0.505	0.396	0.485	0.509	0.519
5C	1.011	0.793	0.970	1.019	1.038
<b>Total Project</b>	<b>5.053</b>	<b>3.964</b>	<b>4.851</b>	<b>5.094</b>	<b>5.191</b>
<b>GP9</b>					
3D	0.205	0.124	0.198	0.207	0.211
4A	0.205	0.124	0.197	0.207	0.211
5A	2.051	1.242	1.969	2.068	2.106
5D	1.641	0.993	1.574	1.653	1.686
<b>Total Project</b>	<b>4.102</b>	<b>2.483</b>	<b>3.938</b>	<b>4.135</b>	<b>4.214</b>
<b>GP10</b>					
2A	0.086	0.052	0.055	0.058	0.059
2C	0.086	0.052	0.055	0.058	0.059
3A	0.086	0.052	0.055	0.058	0.059
4A	0.086	0.052	0.055	0.058	0.059
4C	0.086	0.052	0.055	0.058	0.059
4D	0.343	0.208	0.220	0.231	0.235

Projects Priorities	Actual 2006	Estimated 2007	Proposal 2008	Plan 1 2009	Plan 2 2010
5A	0.255	0.156	0.165	0.172	0.177
5C	0.514	0.312	0.330	0.346	0.352
5D	0.171	0.104	0.110	0.116	0.118
<b>Total Project</b>	<b>1.713</b>	<b>1.040</b>	<b>1.100</b>	<b>1.155</b>	<b>1.177</b>
<b>GP11</b>					
4A	0.410	0.388	0.342	0.358	0.365
5B	0.176	0.167	0.146	0.154	0.157
<b>Total Project</b>	<b>0.586</b>	<b>0.555</b>	<b>0.488</b>	<b>0.512</b>	<b>0.522</b>
<b>Total</b>	<b>31.255</b>	<b>31.123</b>	<b>29.367</b>	<b>30.835</b>	<b>31.423</b>

**WorldAgroforestry Table 5: Investments by Undertaking, Activity and Sector from 2006 to 2010 in millions of US \$**

	Actual 2006	Estimated 2007	Proposal 2008	Plan 1 2009	Plan 2 2010
Increasing Productivity	4.470	4.451	4.200	4.410	4.494
Germplasm Enhancement & Breeding	1.228	1.223	1.153	1.212	1.235
Production Systems Development & Management	3.242	3.228	3.046	3.198	3.259
Cropping systems	0.000	0.000	0.000	0.000	0.000
Livestock systems	0.000	0.000	0.000	0.000	0.000
Tree systems	3.242	3.228	3.046	3.198	3.259
Fish systems	0.000	0.000	0.000	0.000	0.000
Protecting the Environment	5.507	5.483	5.174	5.433	5.536
Saving Biodiversity	4.022	4.005	3.779	3.968	4.043
Improving Policies	7.676	7.643	7.212	7.572	7.716
Strengthening NARS	9.580	9.541	9.002	9.452	9.634
Training and Professional Development	5.259	5.258	4.975	5.234	5.333
Documentation, Publications, Info. Dissemination	3.604	3.588	3.386	3.555	3.623
Organization & Management Counseling	0.173	0.172	0.163	0.171	0.175
Networks	0.543	0.523	0.478	0.492	0.503
<b>Total</b>	<b>31.255</b>	<b>31.123</b>	<b>29.367</b>	<b>30.835</b>	<b>31.423</b>

**WorldAgroforestry Table 6: Project Investments by Developing Region from 2006 to 2010 in millions of US \$**

Project		Actual 2006	Estimated 2007	Proposal 2008	Plan 1 2009	Plan 2 2010
<b>GP1</b>	Asia	0.774	0.975	0.503	0.528	0.538
	LAC	0.009	0.000	0.000	0.000	0.000
	SSA	1.797	3.837	1.979	2.078	2.118
<b>Total Project</b>		<b>2.580</b>	<b>4.812</b>	<b>2.482</b>	<b>2.606</b>	<b>2.656</b>
<b>GP10</b>	SSA	1.713	1.040	1.100	1.155	1.177
<b>Total Project</b>		<b>1.713</b>	<b>1.040</b>	<b>1.100</b>	<b>1.155</b>	<b>1.177</b>
<b>GP11</b>	Asia	0.234	0.222	0.195	0.205	0.209
	LAC	0.059	0.056	0.049	0.051	0.052
	SSA	0.292	0.277	0.244	0.256	0.261
<b>Total Project</b>		<b>0.585</b>	<b>0.555</b>	<b>0.488</b>	<b>0.512</b>	<b>0.522</b>
<b>GP2</b>	Asia	1.264	2.733	1.943	2.040	2.079
	LAC	0.409	0.066	0.047	0.049	0.050
	SSA	2.388	2.727	1.939	2.036	2.075
<b>Total Project</b>		<b>4.061</b>	<b>5.526</b>	<b>3.929</b>	<b>4.125</b>	<b>4.204</b>
GP3	Asia	0.075	0.296	0.245	0.257	0.262
	LAC	0.032	0.159	0.132	0.138	0.141
	SSA	1.397	1.298	1.074	1.128	1.150
<b>Total Project</b>		<b>1.504</b>	<b>1.753</b>	<b>1.451</b>	<b>1.523</b>	<b>1.553</b>
<b>GP4</b>	Asia	0.308	0.882	0.942	0.989	1.008
	LAC	0.000	0.000	0.000	0.000	0.000
	SSA	3.149	2.229	2.381	2.500	2.548
<b>Total Project</b>		<b>3.457</b>	<b>3.111</b>	<b>3.323</b>	<b>3.489</b>	<b>3.556</b>
<b>GP5</b>	Asia	1.003	1.561	1.015	1.066	1.086
	LAC	0.006	0.039	0.025	0.027	0.027
	SSA	1.309	1.796	1.168	1.226	1.249
<b>Total Project</b>		<b>2.318</b>	<b>3.396</b>	<b>2.208</b>	<b>2.319</b>	<b>2.362</b>
<b>GP6</b>	Asia	0.423	0.758	0.998	1.048	1.068
	LAC	0.025	0.004	0.005	0.006	0.006
	SSA	2.602	1.454	1.916	2.011	2.049
<b>Total Project</b>		<b>3.050</b>	<b>2.216</b>	<b>2.919</b>	<b>3.065</b>	<b>3.123</b>

Project		Actual 2006	Estimated 2007	Proposal 2008	Plan 1 2009	Plan 2 2010
<b>GP7</b>	Asia	0.882	0.992	1.172	1.231	1.254
	LAC	0.045	0.049	0.058	0.061	0.062
	SSA	1.858	1.225	1.448	1.520	1.549
<b>Total Project</b>		<b>2.785</b>	<b>2.266</b>	<b>2.678</b>	<b>2.812</b>	<b>2.865</b>
<b>GP8</b>	Asia	1.894	2.227	2.726	2.862	2.916
	LAC	0.064	0.095	0.116	0.122	0.124
	SSA	3.073	1.642	2.009	2.110	2.150
<b>Total Project</b>		<b>5.031</b>	<b>3.964</b>	<b>4.851</b>	<b>5.094</b>	<b>5.190</b>
<b>GP9</b>	Asia	0.654	0.847	1.343	1.410	1.438
	LAC	0.154	0.031	0.049	0.052	0.053
	SSA	3.363	1.606	2.546	2.673	2.724
<b>Total Project</b>		<b>4.171</b>	<b>2.484</b>	<b>3.938</b>	<b>4.135</b>	<b>4.215</b>
<b>Total</b>		<b>31.255</b>	<b>31.123</b>	<b>29.367</b>	<b>30.835</b>	<b>31.423</b>

**WorldAgroforestry Table 7: Summary of Investments by Developing Region from 2006 to 2010 in millions of US \$**

Region	Actual 2006	Estimated 2007	Proposal 2008	Plan 1 2009	Plan 2 2010
SSA	22.941	19.131	17.804	18.693	19.050
Asia	7.511	11.493	11.082	11.636	11.858
LAC	0.803	0.499	0.481	0.506	0.515
<b>Total</b>	<b>31.255</b>	<b>31.123</b>	<b>29.367</b>	<b>30.835</b>	<b>31.423</b>

**WorldAgroforestry Table 8: Expenditure by Object from 2006 to 2010 in millions of US \$**

Object of Expenditure	Actual 2006	Estimated 2007	Proposal 2008	Plan 1 2009	Plan 2 2010
Personnel	13.578	12.571	12.918	13.563	13.823
Supplies and services	9.711	8.117	8.518	8.944	9.114
Collaboration/ Partnerships	3.370	5.797	3.798	3.988	4.064
Operational Travel	3.655	3.383	2.914	3.060	3.118
Depreciation	0.941	1.255	1.219	1.280	1.304
<b>Total</b>	<b>31.255</b>	<b>31.123</b>	<b>29.367</b>	<b>30.835</b>	<b>31.423</b>

**WorldAgroforestry Table 9: Member and Non-Member Unrestricted and Restricted Grants in millions of US \$**

<b>Member</b>	<b>Actual 2006</b>	<b>Estimated 2007</b>	<b>Proposal 2008</b>
<b>Unrestricted Grants</b>			
<b>Member</b>			
Australia	0.189	0.189	0.189
Canada	0.726	0.656	0.656
China	0.020	0.020	0.020
Denmark	0.481	0.000	0.000
Finland	0.443	0.396	0.400
Germany	0.304	0.294	0.294
Ireland	1.137	1.235	1.100
Japan	0.020	0.132	0.132
Netherlands	0.381	0.588	0.590
New Zealand	0.000	0.000	0.000
Norway	0.558	0.522	0.524
Philippines	0.005	0.005	0.006
South Africa	0.020	0.020	0.020
Sweden	0.440	0.425	0.425
Switzerland	0.407	0.397	0.400
Thailand	0.010	0.008	0.100
United Kingdom	1.137	1.125	1.250
United States	0.644	0.483	0.500
World Bank	2.139	1.800	1.800
<b>Subtotal</b>	<b>9.061</b>	<b>8.295</b>	<b>8.406</b>
<b>Non-member</b>			
Others	0.004	0.004	0.005
<b>Subtotal</b>	<b>0.004</b>	<b>0.004</b>	<b>0.005</b>
<b>Total Unrestricted</b>	<b>9.065</b>	<b>8.299</b>	<b>8.411</b>
<b>Restricted Grants</b>			
<b>Member</b>			
ADB	0.008	0.000	0.000
Australia	0.395	0.210	0.249
Austria	0.053	0.035	0.035
Belgium	0.303	0.301	0.305
Brazil	0.027	0.020	0.020
Canada	1.570	0.753	0.533
CGIAR	0.105	0.049	0.000
Denmark	0.164	0.000	0.000
European Commission	0.293	2.671	1.700

<b>Member</b>	<b>Actual 2006</b>	<b>Estimated 2007</b>	<b>Proposal 2008</b>
FAO	0.017	0.438	0.543
Finland	0.026	0.106	0.114
Ford Foundation	0.371	0.256	0.283
Germany	0.000	0.592	0.592
IDRC	0.670	0.412	0.439
IFAD	0.971	1.374	1.251
Ireland	0.000	1.199	1.201
Italy	0.110	0.165	0.192
Japan	0.085	0.000	0.000
Kenya	0.026	0.000	0.000
Netherlands	1.525	1.443	1.502
Norway	0.121	0.024	0.024
Peru	0.088	0.040	0.040
Rockefeller Foundation	0.122	0.032	0.032
Spain	0.286	0.198	0.053
Sweden	3.499	1.148	1.613
Switzerland	0.099	0.000	0.000
UNDP	0.002	0.187	0.187
UNEP	0.496	0.400	0.005
United Kingdom	0.500	0.324	0.156
United States	3.013	4.147	1.936
World Bank	0.610	0.526	0.431
<b>Subtotal</b>	<b>15.555</b>	<b>17.050</b>	<b>13.436</b>
<b>Non-member</b>			
ASARECA	1.065	0.742	0.474
Bioversity International	0.010	0.015	0.015
CIAT	0.056	0.000	0.100
CIFOR	0.013	0.000	0.000
CIP	0.025	0.000	0.087
CIRAD	0.000	0.164	0.164
Common Fund for Commodities	1.289	0.488	0.031
Conservation International Foundation	0.167	0.161	0.161
Cornell University	0.025	0.000	0.000
Global Environment Facility (GEF)	0.386	0.211	0.311
IFPRI	0.171	0.121	0.106
ILRI	0.017	0.000	0.000
IRRI	0.033	0.052	0.021
IUCN	0.212	0.202	0.202

Member	Actual 2006	Estimated 2007	Proposal 2008
IWMI	0.001	0.000	0.000
Others	1.044	2.647	2.317
Plan International	0.037	0.017	0.003
Sasakawa Africa Association	0.004	0.000	0.000
Tinker Foundation	0.005	0.000	0.000
Unidentified	0.000	0.000	2.624
World Food Program (WFP)	0.002	0.000	0.000
World Resources Institute (WRI)	0.016	0.004	0.004
World Wildlife Fund	0.003	0.000	0.000
<b>Subtotal</b>	<b>4.581</b>	<b>4.824</b>	<b>6.620</b>
Member	Actual 2006	Estimated 2007	Proposal 2008
<b>Total Restricted</b>	<b>20.136</b>	<b>21.874</b>	<b>20.056</b>
<b>Total Grants</b>	<b>29.201</b>	<b>30.173</b>	<b>28.467</b>
Summary and Statement of Activities	Actual 2006	Estimated 2007	Proposal 2008
<b>Total Grants</b>	29.201	30.173	28.467
<b>Centre Income</b>	1.190	0.950	0.900
<b>Total Reserve</b>	30.391	31.123	29.367
<b>Total Investment</b>	31.255	31.123	29.367
<b>Surplus (Deficit)</b>	-0.864	0.000	0.000

**WorldAgroforestry Table 10: Allocation of Member Grants and Centre Income to Projects from 2006 to 2010 in millions of US \$**

Project	Member	Actual 2006	Estimated 2007	Proposal 2008	
<b>GP1</b>	Member	Australia	0.050	0.005	0.005
		Belgium	0.011	0.073	0.073
		Canada	0.065	0.026	0.026
		CGIAR	0.001	0.000	0.000
		Denmark	0.002	0.000	0.000
		European Commission	0.004	0.032	0.032
		FAO	0.000	0.020	0.020
		Ford Foundation	0.054	0.007	0.007
		Germany	0.000	0.000	0.000
		IDRC	0.030	0.012	0.012
		IFAD	0.143	0.618	0.516
		Ireland	0.000	0.555	0.557
		Japan	0.011	0.000	0.000
		Kenya	0.001	0.000	0.000
		Netherlands	0.018	0.130	0.150
		Norway	0.003	0.000	0.000
		Rockefeller Foundation	0.004	0.000	0.000
		Spain	0.042	0.007	0.007
		Sweden	0.295	0.021	0.021
		UNDP	0.000	0.001	0.001
		United Kingdom	0.088	0.168	0.000
		United States	0.215	1.374	0.243

Project	Member		Actual 2006	Estimated 2007	Proposal 2008	
Non Member		World Bank	0.011	0.021	0.021	
		ASARECA	0.026	0.106	0.024	
		CIFOR	0.003	0.000	0.000	
		Common Fund for Commodities	0.183	0.050	0.000	
		Conservation International Foundation	0.007	0.027	0.027	
		Cornell University	0.001	0.000	0.000	
		IFPRI	0.029	0.000	0.000	
		ILRI	0.002	0.000	0.000	
		IRRI	0.000	0.026	0.000	
		IUCN	0.083	0.000	0.000	
		IWMI	0.001	0.000	0.000	
		Others	0.173	0.258	0.156	
		Plan International	0.001	0.000	0.000	
		Unidentified	0.000	0.000	0.000	
		World Wildlife Fund	0.002	0.000	0.000	
		Unrestricted + Centre Income	1.026	1.275	0.584	
	<b>Project Total</b>			<b>2.585</b>	<b>4.812</b>	<b>2.482</b>
<b>GP10</b>	Member	Australia	0.105	0.016	0.046	
		CGIAR	0.100	0.049	0.000	
		IDRC	0.177	0.180	0.200	
		Italy	0.110	0.165	0.192	
		Netherlands	0.156	0.000	0.000	
		Norway	0.113	0.000	0.000	
		Switzerland	0.099	0.000	0.000	
	Non Member	ASARECA	0.675	0.506	0.320	
		CIP	0.025	0.000	0.087	
		IFPRI	0.039	0.015	0.000	
		Others	0.058	0.072	0.172	
		Unrestricted + Centre Income	0.056	0.037	0.083	
	<b>Project Total</b>			<b>1.713</b>	<b>1.040</b>	<b>1.100</b>
	<b>GP11</b>	Member	Netherlands	0.319	0.000	0.000
United States			0.007	0.000	0.000	
World Bank			0.169	0.395	0.300	
		Unrestricted + Centre Income	0.091	0.160	0.188	
<b>Project Total</b>			<b>0.586</b>	<b>0.555</b>	<b>0.488</b>	
<b>GP2</b>	Member	Australia	0.008	0.025	0.025	
		Austria	0.049	0.015	0.015	
		Belgium	0.004	0.010	0.010	
		Brazil	0.015	0.000	0.000	
		Canada	0.211	0.477	0.260	
		CGIAR	0.001	0.000	0.000	
		Denmark	0.121	0.000	0.000	
		European Commission	0.013	0.937	0.500	
		FAO	0.000	0.225	0.230	
		Ford Foundation	0.008	0.010	0.010	
		Germany	0.000	0.051	0.051	
		IDRC	0.001	0.000	0.000	
		IFAD	0.147	0.276	0.246	
		Ireland	0.000	0.470	0.470	
		Japan	0.066	0.000	0.000	
		Kenya	0.019	0.000	0.000	
		Netherlands	0.034	0.149	0.149	
		Peru	0.059	0.011	0.011	
		Rockefeller Foundation	0.001	0.000	0.000	
		Spain	0.100	0.082	0.000	
		Sweden	0.032	0.025	0.025	

Project	Member		Actual 2006	Estimated 2007	Proposal 2008
		UNDP	0.002	0.005	0.005
		United Kingdom	0.103	0.041	0.041
		United States	0.194	0.218	0.096
		World Bank	0.131	0.028	0.028
	Non Member	ASARECA	0.291	0.072	0.072
		CIFOR	0.001	0.000	0.000
		Common Fund for Commodities	0.031	0.028	0.028
		Conservation International Foundation	0.029	0.001	0.001
		Cornell University	0.001	0.000	0.000
		IFPRI	0.002	0.000	0.000
		ILRI	0.013	0.000	0.000
		IRRI	0.033	0.000	0.000
		IUCN	0.029	0.000	0.000
		Others	0.108	0.441	0.441
		Plan International	0.004	0.001	0.001
		Sasakawa Africa Association	0.003	0.000	0.000
		Tinker Foundation	0.003	0.000	0.000
		Unidentified	0.000	0.000	0.000
		World Food Program (WFP)	0.001	0.000	0.000
		Unrestricted + Centre Income	2.225	1.928	1.214
		<b>Project Total</b>	<b>4.093</b>	<b>5.526</b>	<b>3.929</b>
GP3	Member	Australia	0.002	0.006	0.006
		Austria	0.000	0.002	0.002
		Belgium	0.006	0.004	0.004
		Canada	0.109	0.036	0.036
		Denmark	0.004	0.000	0.000
		European Commission	0.001	0.053	0.053
		FAO	0.000	0.033	0.033
		Germany	0.000	0.021	0.021
		IDRC	0.007	0.000	0.000
		IFAD	0.008	0.043	0.043
		Ireland	0.000	0.013	0.013
		Italy	0.000	0.000	0.000
		Japan	0.004	0.000	0.000
		Kenya	0.001	0.000	0.000
		Netherlands	0.046	0.047	0.047
		Norway	0.002	0.024	0.024
		Peru	0.004	0.007	0.007
		Rockefeller Foundation	0.000	0.000	0.000
		Spain	0.005	0.010	0.010
		Sweden	0.417	0.088	0.060
		UNDP	0.000	0.001	0.001
		UNEP	0.038	0.005	0.005
		United Kingdom	0.007	0.002	0.002
		United States	0.195	0.264	0.120
		World Bank	0.017	0.007	0.007
	Non Member	ASARECA	0.002	0.020	0.020

Project	Member		Actual 2006	Estimated 2007	Proposal 2008
		Bioersity International	0.000	0.002	0.002
		CIRAD	0.000	0.131	0.131
		Common Fund for Commodities	0.037	0.078	0.000
		Global Environment Facility (GEF)	0.005	0.000	0.000
		ILRI	0.000	0.000	0.000
		IUCN	0.000	0.000	0.000
		Others	0.034	0.287	0.187
		Plan International	0.001	0.002	0.002
		Unidentified	0.000	0.000	0.000
		Unrestricted + Centre Income	0.559	0.567	0.615
<b>Project Total</b>			<b>1.511</b>	<b>1.753</b>	<b>1.451</b>
<b>GP4</b>	Member	Australia	0.069	0.021	0.021
		Belgium	0.235	0.188	0.192
		Canada	0.052	0.158	0.160
		Denmark	0.031	0.000	0.000
		European Commission	0.002	0.044	0.044
		FAO	0.001	0.120	0.220
		Ford Foundation	0.000	0.000	0.000
		Germany	0.000	0.004	0.004
		IDRC	0.000	0.011	0.011
		IFAD	0.101	0.068	0.068
		Ireland	0.000	0.000	0.000
		Japan	0.002	0.000	0.000
		Kenya	0.004	0.000	0.000
		Netherlands	0.014	0.084	0.086
		Norway	0.000	0.000	0.000
		Rockefeller Foundation	0.022	0.018	0.018
		Spain	0.010	0.063	0.000
		Sweden	0.283	0.000	0.200
		UNDP	0.000	0.002	0.002
		UNEP	0.009	0.000	0.000
		United Kingdom	0.039	0.008	0.008
		United States	0.475	0.750	0.400
		World Bank	0.029	0.014	0.014
	Non Member	ASARECA	0.003	0.001	0.001
		Common Fund for Commodities	0.802	0.306	0.000
		Conservation International Foundation	0.113	0.053	0.053
		ILRI	0.001	0.000	0.000
		IUCN	0.002	0.000	0.000
		Others	0.050	0.387	0.448
		Sasakawa Africa Association	0.001	0.000	0.000
		Unidentified	0.000	0.000	0.462
		Unrestricted + Centre Income	1.111	0.811	0.911
<b>Project Total</b>			<b>3.461</b>	<b>3.111</b>	<b>3.323</b>

Project	Member		Actual 2006	Estimated 2007	Proposal 2008	
<b>GP5</b>	Member	ADB	0.002	0.000	0.000	
		Australia	0.051	0.048	0.048	
		Austria	0.000	0.004	0.004	
		Belgium	0.002	0.004	0.004	
		Canada	0.068	0.015	0.000	
		CGIAR	0.001	0.000	0.000	
		Denmark	0.005	0.000	0.000	
		European Commission	0.049	0.291	0.150	
		FAO	0.000	0.006	0.006	
		Finland	0.016	0.021	0.021	
		Ford Foundation	0.076	0.048	0.050	
		Germany	0.000	0.309	0.309	
		IDRC	0.073	0.004	0.004	
		IFAD	0.093	0.055	0.064	
		Ireland	0.000	0.007	0.007	
		Japan	0.001	0.000	0.000	
		Netherlands	0.172	0.480	0.248	
		Peru	0.000	0.002	0.002	
		Rockefeller Foundation	0.020	0.008	0.008	
		Spain	0.010	0.003	0.003	
		Sweden	0.175	0.082	0.096	
		UNDP	0.000	0.107	0.107	
		UNEP	0.020	0.075	0.000	
		United Kingdom	0.061	0.005	0.005	
		United States	0.194	0.098	0.098	
		World Bank	0.012	0.014	0.014	
		Non Member	ASARECA	0.009	0.018	0.018
			CIAT	0.009	0.000	0.000
			CIFOR	0.002	0.000	0.000
			CIRAD	0.000	0.033	0.033
			Common Fund for Commodities	0.025	0.002	0.000
			Conservation International Foundation	0.002	0.034	0.034
			Cornell University	0.003	0.000	0.000
	Global Environment Facility (GEF)		0.080	0.127	0.127	
	IFPRI		0.004	0.044	0.044	
	IRRI		0.000	0.013	0.013	
	IUCN		0.031	0.174	0.174	
	Others		0.081	0.279	0.060	
	Plan International	0.001	0.000	0.000		
	Unidentified	0.000	0.000	0.000		
	World Resources Institute (WRI)	0.003	0.004	0.004		
	Unrestricted + Centre Income		0.969	0.982	0.453	
	<b>Project Total</b>			<b>2.320</b>	<b>3.396</b>	<b>2.208</b>
	<b>GP6</b>	Member	ADB	0.001	0.000	0.000
			Australia	0.016	0.015	0.015
Austria			0.000	0.002	0.002	
Belgium			0.002	0.005	0.005	
Brazil			0.001	0.000	0.000	
Canada			0.282	0.004	0.004	
CGIAR			0.000	0.000	0.000	
European Commission			0.027	0.096	0.066	
FAO			0.003	0.005	0.005	
Finland			0.005	0.021	0.028	
Ford Foundation			0.038	0.028	0.028	

Project	Member		Actual 2006	Estimated 2007	Proposal 2008
		Germany	0.000	0.097	0.097
		IDRC	0.053	0.004	0.004
		IFAD	0.049	0.037	0.037
		Ireland	0.000	0.008	0.008
		Netherlands	0.087	0.189	0.154
		Norway	0.002	0.000	0.000
		Peru	0.002	0.000	0.000
		Rockefeller Foundation	0.007	0.003	0.003
		Spain	0.008	0.001	0.001
		Sweden	0.572	0.056	0.056
		UNDP	0.000	0.033	0.033
		UNEP	0.134	0.240	0.000
		United Kingdom	0.029	0.006	0.006
		United States	0.230	0.360	0.180
		World Bank	0.028	0.009	0.009
	Non Member	ASARECA	0.012	0.005	0.005
		Bioversity International	0.001	0.000	0.000
		CIAT	0.006	0.000	0.000
		CIFOR	0.000	0.000	0.000
		Common Fund for Commodities	0.021	0.001	0.000
		Conservation International Foundation	0.001	0.014	0.014
		Cornell University	0.003	0.000	0.000
		Global Environment Facility (GEF)	0.260	0.042	0.042
		IFPRI	0.001	0.019	0.019
		IRRI	0.000	0.005	0.005
		IUCN	0.035	0.000	0.000
		Others	0.119	0.301	0.299
		Plan International	0.004	0.000	0.000
		Unidentified	0.000	0.000	0.622
		World Food Program (WFP)	0.001	0.000	0.000
		World Resources Institute (WRI)	0.002	0.000	0.000
		Unrestricted + Centre Income	0.999	0.611	1.172
		<b>Project Total</b>	<b>3.041</b>	<b>2.217</b>	<b>2.919</b>
<b>GP7</b>	Member	ADB	0.002	0.000	0.000
		Australia	0.018	0.013	0.013
		Austria	0.004	0.005	0.005
		Belgium	0.006	0.004	0.004
		Brazil	0.000	0.004	0.004
		Canada	0.205	0.004	0.004
		European Commission	0.099	0.383	0.200
		FAO	0.000	0.009	0.009
		Finland	0.000	0.064	0.065
		Ford Foundation	0.055	0.052	0.052
		Germany	0.000	0.006	0.006
		IDRC	0.070	0.000	0.000
		IFAD	0.103	0.007	0.007
		Ireland	0.000	0.004	0.004
		Netherlands	0.086	0.061	0.061
		Peru	0.005	0.006	0.006
		Rockefeller Foundation	0.024	0.000	0.000
		Spain	0.029	0.021	0.021
		Sweden	0.176	0.100	0.100
		UNDP	0.000	0.000	0.000
		UNEP	0.086	0.080	0.000

Project	Member		Actual 2006	Estimated 2007	Proposal 2008
		United Kingdom	0.035	0.002	0.002
		United States	0.330	0.175	0.185
		World Bank	0.051	0.011	0.011
	Non Member	ASARECA	0.036	0.006	0.006
		CIAT	0.011	0.000	0.000
		CIFOR	0.000	0.000	0.000
		Common Fund for Commodities	0.035	0.007	0.000
		Conservation International Foundation	0.009	0.011	0.011
		Cornell University	0.006	0.000	0.000
		IFPRI	0.022	0.000	0.000
		IRRI	0.000	0.005	0.000
		IUCN	0.016	0.000	0.000
		Others	0.225	0.228	0.170
		Plan International	0.006	0.000	0.000
		Unidentified	0.000	0.000	0.632
		World Resources Institute (WRI)	0.004	0.000	0.000
	Unrestricted + Centre Income		1.036	0.998	1.100
	<b>Project Total</b>		<b>2.790</b>	<b>2.266</b>	<b>2.678</b>
<b>GP8</b>	Member	ADB	0.003	0.000	0.000
		Australia	0.063	0.061	0.070
		Austria	0.000	0.004	0.004
		Belgium	0.017	0.006	0.006
		Brazil	0.001	0.012	0.012
		Canada	0.357	0.030	0.040
		CGIAR	0.002	0.000	0.000
		Denmark	0.001	0.000	0.000
		European Commission	0.091	0.820	0.640
		FAO	0.001	0.014	0.014
		Finland	0.005	0.000	0.000
		Ford Foundation	0.104	0.061	0.086
		Germany	0.000	0.104	0.104
		IDRC	0.213	0.053	0.060
		IFAD	0.186	0.091	0.091
		Ireland	0.000	0.141	0.141
		Italy	0.000	0.000	0.000
		Japan	0.001	0.000	0.000
		Kenya	0.000	0.000	0.000
		Netherlands	0.306	0.236	0.240
		Peru	0.003	0.011	0.011
		Rockefeller Foundation	0.043	0.003	0.003
		Spain	0.040	0.007	0.007
		Sweden	0.415	0.265	0.235
		UNDP	0.000	0.037	0.037
		UNEP	0.181	0.000	0.000
		United Kingdom	0.108	0.076	0.076
		United States	0.629	0.326	0.254
		World Bank	0.070	0.016	0.016
Non Member		ASARECA	0.008	0.007	0.007

Project	Member		Actual 2006	Estimated 2007	Proposal 2008
		Bioversity International	0.001	0.001	0.001
		CIAT	0.030	0.000	0.100
		CIFOR	0.006	0.000	0.000
		Common Fund for Commodities	0.105	0.003	0.003
		Conservation International Foundation	0.004	0.020	0.020
		Cornell University	0.010	0.000	0.000
		Global Environment Facility (GEF)	0.004	0.042	0.142
		IFPRI	0.068	0.031	0.031
		ILRI	0.001	0.000	0.000
		IRRI	0.000	0.003	0.003
		IUCN	0.011	0.028	0.028
		Others	0.151	0.215	0.185
		Plan International	0.017	0.003	0.000
		Unidentified	0.000	0.000	0.420
		World Resources Institute (WRI)	0.007	0.000	0.000
		Unrestricted + Centre Income	1.790	1.237	1.764
		<b>Project Total</b>	<b>5.053</b>	<b>3.964</b>	<b>4.851</b>
<b>GP9</b>	Member	Australia	0.013	0.000	0.000
		Austria	0.000	0.003	0.003
		Belgium	0.020	0.007	0.007
		Brazil	0.010	0.004	0.004
		Canada	0.221	0.003	0.003
		CGIAR	0.000	0.000	0.000
		European Commission	0.007	0.015	0.015
		FAO	0.012	0.006	0.006
		Ford Foundation	0.036	0.050	0.050
		Germany	0.000	0.000	0.000
		IDRC	0.046	0.148	0.148
		IFAD	0.141	0.179	0.179
		Ireland	0.000	0.001	0.001
		Italy	0.000	0.000	0.000
		Kenya	0.001	0.000	0.000
		Netherlands	0.287	0.067	0.367
		Norway	0.001	0.000	0.000
		Peru	0.015	0.003	0.003
		Rockefeller Foundation	0.001	0.000	0.000
		Spain	0.042	0.004	0.004
		Sweden	1.134	0.511	0.820
		UNDP	0.000	0.001	0.001
		UNEP	0.028	0.000	0.000
		United Kingdom	0.030	0.016	0.016
		United States	0.544	0.582	0.360
		World Bank	0.092	0.011	0.011
	Non Member	ASARECA	0.003	0.001	0.001
		Bioversity International	0.008	0.012	0.012
		CIFOR	0.001	0.000	0.000
		Common Fund for Commodities	0.050	0.013	0.000
		Conservation International Foundation	0.002	0.001	0.001
		Cornell University	0.001	0.000	0.000
		Global Environment Facility (GEF)	0.037	0.000	0.000
		IFPRI	0.006	0.012	0.012
		IRRI	0.000	0.000	0.000

Project	Member	Actual 2006	Estimated 2007	Proposal 2008
	IUCN	0.005	0.000	0.000
	Others	0.045	0.179	0.199
	Plan International	0.003	0.011	0.000
	Tinker Foundation	0.002	0.000	0.000
	Unidentified	0.000	0.000	0.488
	World Wildlife Fund	0.001	0.000	0.000
	Unrestricted + Centre Income	1.257	0.643	1.227
<b>Project Total</b>		<b>4.102</b>	<b>2.483</b>	<b>3.938</b>
<b>Total Restricted</b>		<b>20.136</b>	<b>21.874</b>	<b>20.056</b>
<b>Total Unrestricted + Centre Income</b>		<b>11.119</b>	<b>9.249</b>	<b>9.311</b>
<b>Total</b>		<b>31.255</b>	<b>31.123</b>	<b>29.367</b>

**WorldAgroforestry Table 11: Internationally and Nationally Recruited Staff from 2006 to 2010 in millions of US \$**

	Actual 2006	Estimated 2007	Proposal 2008	Plan 1 2009	Plan 2 2010
NRS	395	339	360	391	395
IRS	49	37	42	50	50
<b>Total</b>	<b>444</b>	<b>376</b>	<b>402</b>	<b>441</b>	<b>445</b>

**WorldAgroforestry Table 12: Currency Structure of Expenditure from 2006 to 2008 in millions of units and percent**

Currency	Actual 2006			Estimated 2007			Proposal 2008		
	Amount	\$ Value	% Share	Amount	\$ Value	% Share	Amount	\$ Value	% Share
IDR	1,0860.931	1.193	4	1,0500.000	1.167	4	1,0600.000	1.200	4
KES	501.289	7.000	22	500.000	7.462	24	520.000	7.762	26
Others	1,5069.192	6.782	22	1,5000.000	7.000	22	1,5100.000	7.200	25
USD	0.000	16.280	52	0.000	15.494	50	0.000	13.205	45
<b>Total</b>		<b>31.255</b>	<b>100 %</b>		<b>31.123</b>	<b>100 %</b>		<b>29.367</b>	<b>100 %</b>

**WorldAgroforestry Table 13: Statement of Financial Position (SFP), 2006-2008**

Assets, Liabilities and Net Assets	2006	2007	2008
<b>Current Assets</b>			
Cash and Cash Equivalent	13.268	13.588	12.906
Investments	0.000	0.000	0.000
Accounts Receivable			
- Donor	7.038	6.708	6.214
- Employees	0.094	0.086	0.065
- Other CGIAR Centres	0.874	0.624	0.620
- Others	2.313	1.867	1.822
Inventories	0.088	0.086	0.084
Pre-paid Expenses	0.033	0.074	0.050
<b>Total Current Assets</b>	<b>23.708</b>	<b>23.033</b>	<b>21.761</b>

Non-Current Assets				
Net Property, Plan and Equipment	5.993	5.373	5.041	
Investments	0.000	0.000	0.000	
Other Assets	0.000	0.000	0.000	
Total Non-Current Assets	5.993	5.373	5.041	
Total Assets	29.701	28.406	26.802	
Current Liabilities				
Overdraft/Short Term Borrowings	0.000	0.000	0.000	
Accounts Payable				
- Donor	6.588	6.694	6.200	
- Employees	0.524	0.422	0.240	
- Other CGIAR Centres	0.140	0.221	0.100	
- Others	1.795	1.425	0.985	
Accruals and Provisions	2.663	1.470	0.950	
Total Current Liabilities	11.710	10.232	8.475	
Non-Current Liabilities				
Accounts Payable				
- Employees	4.988	5.171	5.324	
- Deferred Grant Revenue	0.000	0.000	0.000	
- Others	0.000	0.000	0.000	
Total Non-Current Liabilities	4.988	5.171	5.324	
Total Liabilities	16.698	15.403	13.799	
Net Assets				
Unrestricted				
- Fixed Assets	9.168	9.168	9.168	
- Unrestricted Net Assets Excluding Fixed Assets	3.835	3.835	3.835	
Total Unrestricted Net Assets	13.003	13.003	13.003	
Restricted	0.000	0.000	0.000	
Total Net Assets	13.003	13.003	13.003	
Total Liabilities and Net Assets	29.701	28.406	26.802	

**WorldAgroforestry Table 14: Statement of Activities (SOA), 2006-2008 in \$ millions**

		Unrestricted	Restricted		Total		
			Temporary	Challenge Programs	2006	2007	2008
Revenue and Gains	Grant Revenue	9.065	20.107	0.041	29.213	30.173	28.467
	Other revenue and gains	1.190	0.000	0.000	1.190	0.950	0.900
	Total revenue and gains	10.255	20.107	0.041	30.403	31.123	29.367
Expenses and Losses	Program related expenses	8.771	20.040	0.041	28.852	26.583	24.739

	Management and general expenses	4.650	0.066	0.000	4.716	4.540	4.628
	Other losses expenses	0.000	0.000	0.000	0.000	0.000	0.000
	Sub Total expenses and losses	13.421	20.106	0.041	33.568	31.123	29.367
	Indirect cost recovery	-2.313	0.000	0.000	-2.313	0.000	0.000
	Total expenses and losses	11.108	20.106	0.041	31.255	31.123	29.367
	Net Operating Surplus / (Deficit)	-0.853	0.001	0.000	-0.852	0.000	-0.000
	Extraordinary Items	0.000	0.000	0.000	0.000	0.000	0.000
	NET SURPLUS / (DEFICIT)	-0.853	0.001	0.000	-0.852	0.000	-0.000
Object of Expenditure	Personnel	7.777	5.786	0.015	13.578	12.571	12.918
	Supplies and services	1.280	8.413	0.018	9.711	8.117	8.518
	Collaboration/ Partnerships	0.588	2.782	0.000	3.370	5.797	3.798
	Operational Travel	0.794	2.853	0.008	3.655	3.383	2.914
	Depreciation	0.669	0.272	0.000	0.941	1.255	1.219
	Total	11.108	20.106	0.041	31.255	31.123	29.367