

Paths to prosperity through agroforestry



ICRAF's
Corporate Strategy
2001–2010

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Summary

This document presents the corporate strategy of the International Centre for Research in Agroforestry for the first decade of the 21st century. It describes who we are, why we exist, what we do, how we do it, and to what end.

Our business is agroforestry — farming with trees. About 1.2 billion people in developing countries depend on agroforestry products and services for their livelihoods. Agroforestry is one key path to prosperity for poor people suffering from hunger, malnutrition, abject poverty and the deterioration of the environment in areas that have been bypassed by the Green Revolution. But unlike other paths to prosperity, agroforestry provides the added value of optimising the trade-offs between farmers' private benefits and global environmental benefits. Today the work of ICRAF and partners is reaching hundreds of thousands of poor people.

ICRAF's vision

By 2010 ICRAF sees 80 million agricultural poor with access to agroforestry research innovations that will improve their livelihoods and help sustain the global environment. Agricultural poor are farmers, other rural dwellers, and peri-urban and urban farmers who live on less than US \$1 per day.

ICRAF's mission

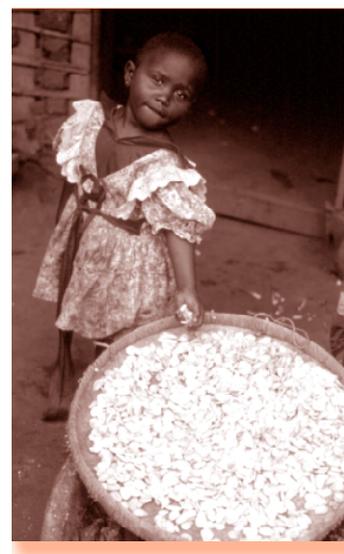
To conduct innovative research and development on agroforestry, strengthen the capacity of our partners, enhance worldwide recognition of the human and environmental benefits of agroforestry, and provide scientific leadership in the field of integrated natural resource management. We will do this by combining the best of science with farmer knowledge in a wide range of strategic alliances along the research–development continuum.

ICRAF's corporate strategy rests on three interdependent goals, each one integral to the achievement of our mission and the realisation of our vision for 2010. ICRAF is accountable to its stakeholders in achieving these goals, which are directly linked to the activities of our three divisions:

Research: conduct interdisciplinary natural resource management research to improve agroforestry trees, enhance their ecosystem functions, and improve policies

Development: rapidly scale up the adoption and impact of agroforestry research by engaging with development partners

Agroforestry is one key path to prosperity for poor people suffering from hunger, malnutrition, abject poverty



Management Services: provide a strong, diversified human and financial resource base that supports ICRAF's research and development efforts.

All ICRAF's activities are located along the research-to-development continuum. Efforts at the research end produce the new technologies and policy innovations needed to make ICRAF's downstream efforts successful. Efforts at the development end generate results that feed back into the Centre's research, helping to keep research relevant to the needs of the poor. This interdependence between research and development is the defining element of our strategy. It is what sets us apart from others doing similar work, and it is our greatest strength as we position the Centre at the heart of development-oriented research.

All our research efforts are underpinned by an interdisciplinary skill mix, a systems approach, and a suite of collaborative alliances with advanced research institutes (ARIs), national agricultural, forestry and policy research systems (NARS), non-governmental and farmer organisations (NGOs), universities and the emerging agroforestry private sector.

Research

ICRAF's research is conceived and implemented as an integrated natural resource management (NRM) agenda. This approach is selected because poor farmers often live in areas with degraded lands, including difficult ecological zones where trees can make a particularly significant impact on food and income security for farmers. NRM research benefits others as well, such as community-level land users, national and global policy-makers and institutions, and the general public. Our research focuses on a wide variety of environments, that require a flexible range of management options and where 'all-encompassing' technologies cannot be successfully applied in a blanket fashion. NRM builds upon the production and ecosystem service functions that natural capital fulfils in agriculture. Such functions increase productivity while ensuring the sustainability of these increases. ICRAF's research focuses on generating new knowledge on domesticating indigenous trees that generate high-value products for income generation; on improving the ecosystem services of trees — such as soil fertility replenishment, watershed hydrology and carbon sequestration — for attaining food security and ecosystem resilience; and on conducting policy research to improve decision-making that facilitates agroforestry innovations.

Development

In a departure from traditional CGIAR approaches to disseminating knowledge and technologies, ICRAF has assumed, through its Development Division, a more hands-on, proactive role in understanding, facilitating and catalysing the process of 'scaling-up'. We believe that we will have greater and earlier impact on poverty reduction and environmental sustainability by directly engaging in the

development process through strategic partnerships. The main elements of ICRAF's development strategy are strategic alliances, innovation assessment, germplasm supply, market development, policy dialogue, knowledge sharing, capacity building and technical support.

Management Services

To accommodate this strategy, ICRAF will expand its human and financial resources and add new regional dimensions. It will also terminate some activities during this decade. The priority setting mechanism is our annual Programme of Work and Budget, which includes accountability dimensions. ICRAF has a tradition of ongoing organisational change. The priorities revised annually will result in frank appraisals of what we have delivered, what we must deliver and what we can no longer deliver because of changes in the external or internal environment. Our vision, mission and values provide the criteria for making hard choices. The Management Services Division oversees the continuing process of organisational change, encouraging the growth of ICRAF as a team-based learning institution.

Our operational matrix

ICRAF operates in the context of a matrix in which five thematic programmes cut across five strategically chosen regions (Southern Africa, East/Central Africa, the Sahel, Latin America, and Southeast Asia). In developing a more explicitly poverty-focused strategy for 2001–2010, we will engage more directly with South Asia, China and semi-arid Latin America because of the large numbers of agricultural poor in these regions and the potential of agroforestry innovations to make a positive difference there.

The resources required to implement the strategy are substantial. We will seek first and foremost to maintain and expand investments from our traditional financial partners. But we will also build on this solid base of support to diversify our funding with new and non-traditional sources. This approach will add value to the investments made by our traditional supporters. The compelling nature of our agenda, our strong track record and our strategically integrated resource mobilisation strategy leads us to believe that we can achieve a level of resources commensurate with our vision, making a significant difference in the lives of millions of poor people and help us safeguard the global environment for all humankind.

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The human and environmental challenges

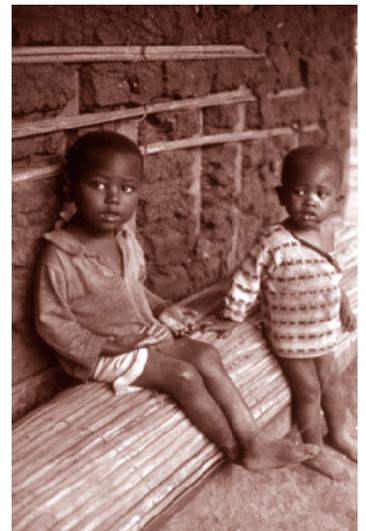
As we enter the 21st century, the challenges facing people in developing countries are immense. Despite the progress achieved in agricultural research and development during the last half of the 20th century, almost one-quarter of the world's population (1.2 billion people) lives in absolute poverty — on less than 1 US dollar a day. Eight hundred million people still go to bed hungry every night and malnutrition is rampant, especially in sub-Saharan Africa and South Asia. This food insecurity further exposes the poor to extreme environmental and economic risks.

Extreme poverty is exacerbated by several major problems. Rural women, who are largely responsible for feeding the family and often head up the household, lack access to land tenure and to primary education. In Africa, the impact of AIDS on productivity is enormous, affecting the availability of family farm labour as well as the resources that must be devoted to caring for the victims. People who migrate to cities in the hope of finding work that will provide them with a better life often find themselves unemployed. Where this is happening, farm labour becomes scarce, agricultural production further decreases and food insecurity increases. This drain can be halted by making life better for people who wish to remain in the countryside. If they can grow more food and earn extra income from varied farm products, they will have a better chance at access to education, security, health care, information, and other basic services the rest of the world now takes for granted. Humankind has a moral imperative to eliminate the remaining areas of widespread poverty as we enter a decade in which the livelihoods of most people in the world have reached unprecedented levels of prosperity.

The twin problems of low agricultural productivity and severe deterioration of the rural environment are major manifestations of rural poverty. For a number of complex reasons — including over-use of natural resources, poor land management, and ineffective and inappropriate government policies — the natural resource base on which agriculture depends is becoming severely degraded through deforestation, soil fertility depletion, water scarcity, erosion of both soil and genetic resources, and carbon losses. Water scarcity in particular looms as one of the main limiting factors in the next decades, affecting mainly the poor. The deterioration of the tropical agricultural landscape triggers negative environmental consequences affecting the entire world, such as the loss of biodiversity and increasing carbon in the atmosphere.

Humankind has a moral imperative to reverse the downward environmental spiral if we are to survive on this planet during the 21st century.

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Box 1. The problem in a nutshell

- billions of people in the developing world live in absolute poverty and millions of children are malnourished — unacceptable in the 21st century
- people in developing countries, especially Africa, face gross food insecurity
- the global environment is deteriorating, affecting all humankind

Given the poor state of many of the developing world's rural areas, it will not be easy to address these three social and environmental problems. ICRAF's strategy focuses on the 'agricultural poor' comprising farm families, other rural dwellers who depend primarily on agriculture, and peri-urban and urban farm families who earn less than the equivalent of \$1 US per day. Sustainable agricultural growth is the overall target because it leads to income generation and food security. Agroforestry can help because it increases agricultural growth and strengthens the natural resource base at the same time.

Look to trees for solutions

Approximately 1.2 billion people — 20% of the world's population — depend to a large extent on agroforestry products and services for their survival. Simply put, agroforestry means farming with trees. The formal definition appears below.

Box 2. Definition of agroforestry

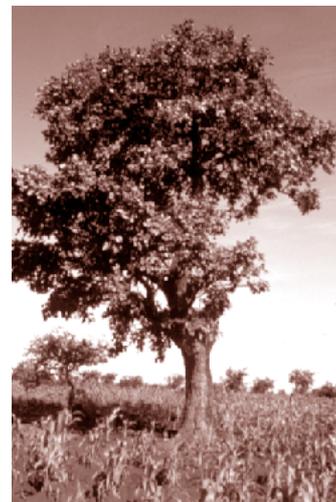
Agroforestry is a dynamic, ecologically based, natural resource management practice that, through the integration of trees on farms and in the agricultural landscape, diversifies and sustains production for increased social, economic and environmental benefits.

Agroforestry is different from forestry and from conventional agriculture. The discipline of agroforestry focuses on trees on farms while the discipline of forestry focuses on trees in forests and commercial tree plantations. Agroforestry is one form of agriculture that combines trees with crops and/or livestock in time or in space. Although the term is fairly new, the practice of agroforestry is based on a vast store of indigenous knowledge developed by farmers since the dawn of agriculture. Researchers began to link this knowledge with modern science only twenty years ago. Agroforestry is now providing powerful technological and policy innovations that are rapidly spreading in Africa, Asia, Latin America, and more recently, in several developed countries. Many of ICRAF's partners in research and development, in the governmental and non-governmental agencies with which we work on the ground, and our investors, share our strong belief that, by its nature, agroforestry is one of the more successful options to improve the livelihoods of the poor while protecting the natural resource base.

Agroforestry is a form of natural resource management. Other forms include fisheries, forestry, and water management. Natural resource management can be defined as the management of natural capital that produces flows of desirable products and services at local, national, regional and global scales. Natural capital is the stock of resources generated by natural biogeochemical processes and solar energy that produce such flows in time and space. This is different from other kinds of capital, such as manufactured, financial, human and social capital.

Incorporating trees into farming systems often leads to greater prosperity at the farm level. Trees provide farmers with marketable products — such as lumber, building poles, firewood, animal fodder, fruits and medicines — all of which earn extra income. They improve soil fertility by fixing nitrogen from the air and recycling nutrients from the soil, thereby helping to increase crop yields and helping to ensure stability of future production. Trees on farms help hold

Agroforestry is one form of agriculture that combines trees with crops and/or livestock in time or in space



moisture where it is needed, reduce soil erosion and keep valuable topsoil in place, reduce the intensity of downstream flooding and maintain watershed functions. Trees provide a sustainable source of wood for fuel and for building materials. They serve as live fences in semi-arid regions, protecting vegetable and cereal gardens that would otherwise be overrun by livestock. Trees increase ecosystem biodiversity above and below ground. And they can help ameliorate global climate change by sequestering carbon — in their biomass as well as in the soil — that otherwise would be added to the earth’s atmosphere. Examples are shown below.

Box 3. The principal economic and ecosystem functions of agroforestry trees at different scales

Geographical scale	Products and services
Farm	<ul style="list-style-type: none"> Food production High-value products Nutrient capture and cycling Erosion control Water cycling Genetic diversity Micro-climate regulation Boundary delineation
Watershed/Village/ Landscape	<ul style="list-style-type: none"> Decreased poverty Rural industries Better use of common property resources Decreased migration to cities Erosion and sedimentation control Water cycling Landscape patches (refugia, pollination, biocontrol)
National/Regional	<ul style="list-style-type: none"> Decreased poverty More access of tree products to the urban poor Agriculture as the engine of growth Decreased deforestation and desertification Export of high-value tree products Biodiversity conservation and use Better access to water resources Decrease atmospheric pollution (smoke and haze)
Global	<ul style="list-style-type: none"> Carbon sequestration Greenhouse gas regulation Biodiversity conservation Poverty reduction Decreased human migration

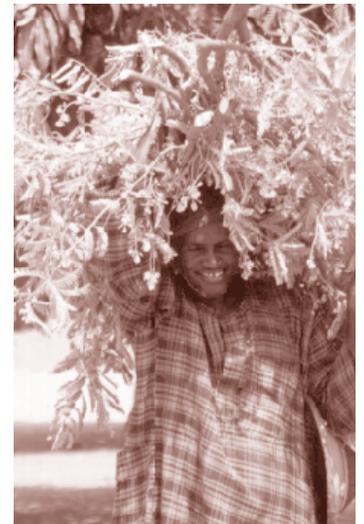
Furthermore, the importance of agroforestry is increasing, providing additional opportunities, because of

- growing body of scientific evidence of the effectiveness of agroforestry leading to increasing demand
- global trends in urbanization, democratization, decentralization, market liberalization and trade strengthens agroforestry opportunities
- rising importance of concerns about climate change, biodiversity, deforestation and desertification strengthens the role of agroforestry
- emerging market opportunities for tree products that facilitate the intensification and diversification of small-scale farms
- increasing recognition of the importance of improved livelihoods in development
- large-scale impact is ahead for agroforestry research in contrast to the gains achieved by research that launched the Green Revolution in the 1970s and 80s

Box 4. One solution in a nutshell

Agroforestry — farming with trees — is a key path to prosperity for millions of developing-country farm families, leading to extra income, greater food and nutritional security, meeting other basic human needs and living in a sustainable environment. But, unlike other paths to prosperity, agroforestry provides the added value of optimising the trade-offs between farmer private benefits and global environmental benefits.

Trees provide a sustainable source of wood for fodder, fuel and building materials



ICRAF — a brief history

The International Council for Research in Agroforestry was established in 1978 to promote agroforestry research in developing countries.

ICRAF was created in response to a visionary study led by John Bene of Canada's International Development Research Centre (IDRC). The study coined the term "agroforestry" and called for recognition of the key role trees play on farms. During the 1980s ICRAF operated as an information council focused on Africa. It joined the Consultative Group on International Agricultural Research (CGIAR) in 1991 to conduct strategic research on agroforestry at a global scale, changing its name from Council to Centre. After entering the CGIAR, its first strategic plan focused on tackling poverty, food security and environment through two means: overcoming land depletion in smallholder farms of sub-humid and semiarid Africa, and searching for alternatives to slash-and-burn agriculture at the margins of the humid tropical forests. In implementing this strategy, ICRAF expanded into Latin America and Southeast Asia while strengthening its activities in Africa. As a result, ICRAF is now recognised as the international leader in agroforestry research and development.

The first CGIAR-sponsored External Programme and Management Review (EPMR) of ICRAF in 1993, thoroughly examined the Centre's strategy and operational plans. It found that it was on the right track towards becoming a strategic, international research organisation and concluded that *"ICRAF stands at the centre of the most important land-use issues in the tropics, a secure foundation for its future development."*

ICRAF continued the process of institutional transformation experiencing profound changes, by developing a science culture, building adequate research facilities, and doubling its resources in five years. A second strategic exercise took place in 1997 as part of the 1998–2000 medium-term plan. The medium-term plan reflected a deeper evolution in the management of the Centre, a shift towards regionalisation, a more explicit natural resource management approach, and the objectives of the newly created Development Division.

The second EPMR (1998) found that ICRAF had delivered on the expectations of the previous EPMR and concluded that *"ICRAF is a well-functioning Centre, with high-quality scientific research programmes, both at headquarters and in the regions, and an efficient management system."*

The 1998 EPMR also noted that the impact of ICRAF's work is beginning to be felt by farmers, national institutions, the international scientific community and global development organisations. ICRAF's impact on improving rural livelihoods is mainly due to the

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enhancement of a major ecosystem function of trees — replenishing soil fertility in Africa. ICRAF's policy research resulted in securing property rights for people living and working in complex agroforests in Indonesia, and access to diverse and productive populations of the valuable capirona tree (*Calycophyllum spruceanum*) for farmers in Peruvian Amazon. The numbers of agricultural poor who can be reached by these impacts is projected to be on the order of hundreds of thousands.

ICRAF's staff cannot be the world's experts on all conceivable dimensions of agroforestry — no single institution could achieve that goal, nor should they wish to do so. There are efficiencies to be gained in a degree of speciality which is why ICRAF engages in strategic alliances with a range of other institutions. Some of these partners are centres of excellence in a specific topic of relevance to agroforestry and others are involved in applied research and delivery pathways across the research–development continuum. Interdependence with partners is a guiding operational principle of ICRAF, and is implemented in the 12 countries in which we have senior staff in residence and 20 others with which we collaborate. Examples of ongoing, substantive partnerships are indicated below, based on a 1997 survey with some updating. The magnitude of institutions with which we collaborate indicates the high degree of interdependent relationships; some are large global institutions, others local organisations. See Box 5 opposite.

Interdependent partnerships carry transaction costs and benefits, which are continuously assessed. For example, in 1997 ICRAF examined 450 partnerships and determined the average cost was equivalent to two person-months a year of senior staff time. In terms of benefits 49% of the partnerships met all the mutually agreed objectives and an additional 35% met half the objectives.

We integrate different expertise within a natural resources management framework with a strong focus on trees in agricultural systems. By doing so at different geographical scales, including the global scale, we can compare and synthesise results from field work on three different continents and draw powerful implications for the extrapolation of these results. ICRAF's comparative advantage, therefore, lies in the application of science to development through agroforestry.

“ICRAF is a well-functioning Centre, with high-quality scientific research programmes, both at headquarters and in the regions, and an efficient management system”

–External Programme and Management Review



Box 5. A sampling of ICRAF's institutional collaborators

Type of institutions	#	Examples
NARS (in agriculture, forestry, natural resources, policy)	59	KARI, Embrapa, Indonesian Ministry of Forestry
NGOs and farmer organisations	112	World Vision, CARE, CODESU, LATIN
International research centres	19	CIFOR, CIMMYT, TSBF, IPGRI
ARI's (Advanced Research Institutions)	94	Wageningen, Cornell, ACTS, IGBP, JIRCAS, USDA-ARS, CSIRO, IRD, CABI
Universities in developing countries	120	UPLB, Makerere, La Molina
Regional organizations	13	PROCITROPICOS, CORAF, SACCAR, BIOTROP
Public awareness/ resource mobilization institution	3	Public Strategies Group, Future Harvest, National Arbor Day Foundation
Development organisation	15	World Bank, FAO, Winrock, GEF, UNEP
Global convention institutions	5	IPCC, CBD, CITES
Private sector	4	Boehringer Ingelheim

In addition to the human and environmental challenges previously described, ICRAF faces a series of institutional or external challenges that can seriously affect its impact, some of which are described in Box 6 on page 9.

The 1998 EPMP recommended that ICRAF develop a new strategy for the next decade to further strengthen its strategic research and scale up its impact to reach hundreds of millions of poor. This exercise was done in a consultative, inclusive and iterative manner, starting with a visioning exercise during a Board of Trustees–Senior Management Retreat in April 1998. This was followed by several consultations with our partners at the regional level, three management retreats with senior and middle managers, an annual programme review with ICRAF staff, three Board of Trustees meetings and two additional Board–Management Retreats. The culmination was formal approval by the Board of Trustees on April 6, 2000.

Box 6. External challenges facing ICRAF in successfully carrying out its work

- political changes that make it either harder or easier to work with governments and other partners
- increased inequity between the rich and the poor, resulting in civil strife, human migration and personal insecurity
- AIDS taking away much of the rural labour force in Africa
- weakening of some ICRAF partners, particularly NARS
- higher transaction costs with expanded partnerships
- extreme weather events that are expected to intensify with climate change
- changes in traditional funding that jeopardise the resource base
- changes in the CGIAR that may result in instability in the system
- changes in ICRAF's current ability to recruit and retain excellent staff

This document describes ICRAF's corporate strategy. In addition, cascading strategies have been developed by ICRAF's Research, Development, and Management Services divisions, our five thematic programmes and our five regions. These strategies are consistent with the overall corporate strategy but provide more specificity and depth to guide our staff and meet the needs of our partners at these different levels. This strategic plan consists of our vision, mission, values, goals, the research–development continuum, our institutional objectives, geographical scope, organisation and deliverables.

ICRAF's strategy for the next decade is to further strengthen its strategic research and scale up its impact to reach hundreds of millions of poor



ICRAF's vision for 2010

Through agroforestry, 80 million poor people will have more options for improved livelihoods, and the global environment will be more sustainable.

The justification for the number of agricultural poor to be reached appears in Annex 1 of this document. By 2020, we expect this number will have more than doubled. Similar numbers of people have benefited from the work of sister CGIAR centres such as the International Rice Research Institute (IRRI) and the International Centre for the Improvement of Maize and Wheat (CIMMYT) during the first decades of the Green Revolution. This vision sets the broad outline of the strategic plan. A robust vision allows the institution to adapt to change, to learn.

ICRAF's mission

To conduct innovative research and development on agroforestry, strengthen the capacity of our partners, enhance worldwide recognition of the human and environmental benefits of agroforestry, and provide scientific leadership in the field of integrated natural resource management.

ICRAF's mission therefore is to lead global efforts in agroforestry research and development aimed at transforming the Centre's vision of a better future into reality. This will be done by combining the best of science with farmers' knowledge in a wide range of strategic alliances across the research–development continuum.

Our mission statement captures our purpose and is in synchrony with the current mission of the CGIAR: *“To contribute to food security and poverty eradication through research promoting sustainable agricultural development based on the environmentally sound management of natural resources. This mission will be achieved through research leadership, partnership, capacity building and policy dialogue.”* ICRAF goes beyond the traditional approach by explicitly engaging across the research–development continuum.

Organisational values

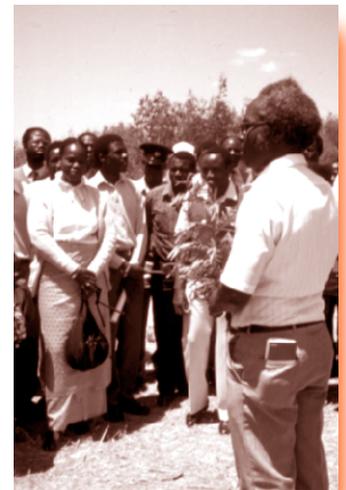
Like other viable, healthy organisations, ICRAF is imbued with its own set of values that collectively describe the culture of the organisation. For ICRAF, those values include

- ensuring a high level of professionalism among our staff
- fostering a commitment to developing true partnerships with others

- being responsive to the needs of our partners and those for whom we work
- valuing creativity and teamwork as we do our jobs
- advancing interdependence internally and in our relationships with our partners
- recognising diversity in the workplace — gender, cultural and professional — as strengths upon which to build
- advocating transparency in our partnerships, in our activities, in our budgeting, and in our decision-making
- supporting an informal working environment in which effective vertical and horizontal communication is valued above hierarchy
- placing a strong emphasis on the importance of family and of having a life outside of ICRAF
- maintaining a deep concern for the communities in which we live and work
- encouraging staff to have a sense of humour in the face of many challenges — a trait commonly encountered among ICRAF staff — one that goes a long way toward making the Centre an attractive place to work

These values help us set priorities and guide the decisions needed to achieve our vision.

ICRAF will combine the best of science with farmers' knowledge in a wide range of strategic alliances across the research–development continuum



Goals and performance management

ICRAF's corporate strategy rests on three super-ordinate goals or interdependent pillars, each one integral to the achievement of our mission and the realisation of our vision for 2010:

- domesticate agroforestry trees, enhance their ecosystem functions and improve policies through interdisciplinary natural resource management research
- rapidly scale up the adoption and impact of agroforestry research by engaging with development partners
- provide a strong, diversified human and financial resource base that supports ICRAF's research and development efforts

Performance management and accountability

Our goals are directly linked to the activities of our Research, Development and Management Services divisions within the research–development continuum framework. ICRAF is accountable to its stakeholders in achieving these goals. The first goal — science quality — is normally evaluated by the impact of peer-reviewed publications on the scientific community, and by the ability to attract excellent collaborators and postgraduate students from the best universities in the world. The second goal — scaling up — will be evaluated by the numbers of farmers reached and the changes in their livelihoods. The third goal can be evaluated by whether ICRAF has stable and resilient human and financial resources. Accountability for achieving our goals will be fostered in two ways:

Reviews, including

- EPMRs in 2003 and 2008
- other normal internal and external reviews
- evaluation and feedback from partner organisations
- impact assessments

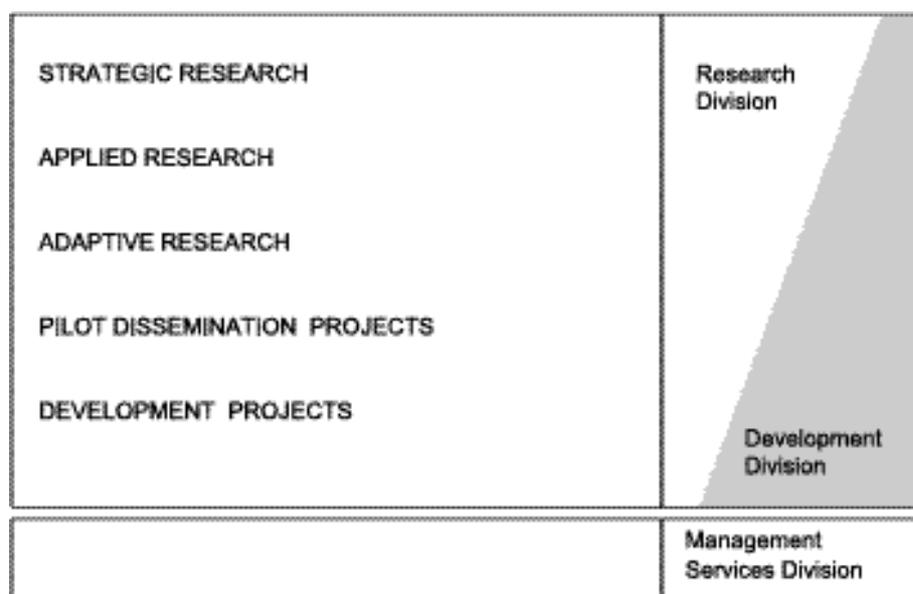
An internal performance management system that includes

- creating performance indicators for each goal
- establishing milestones for each goal and indicator
- measuring and reporting on performance regularly
- using performance information to continuously make operating adjustments that improve performance
- employ performance information in setting priorities, allocating resources and evaluating staff performance

The research-to-development continuum

The research-to-development continuum is the heart of ICRAF's corporate strategy, as illustrated in Box 7. All ICRAF's activities are located somewhere along that continuum, while maintaining the *raison d'être* of ICRAF — a research institution. But even at the extreme ends of the continuum — where one might expect to find 'pure strategic' research or 'pure' development work — research and development are intertwined. Efforts at the development end of the continuum generate results that feed back into the Centre's research, helping to keep research relevant to the needs of the agricultural poor. Efforts at the research end of the continuum produce the new technologies and policy innovations needed to make ICRAF's downstream efforts successful. The Management Services Division provides the essential support.

Box 7. ICRAF's research-to-development continuum



This interdependence between research and development is the defining element of ICRAF's corporate strategy. It is what sets us apart from others doing similar work, and is one of our greatest strengths as we position the Centre at the heart of development-oriented research. A description of the strategic components of this continuum follows.

Research

ICRAF's research is conceived and implemented as an integrated natural resources management (NRM) agenda. This approach builds upon the results of the Green Revolution but differs from it in four principal ways.

The types of farmers whose needs we primarily address are the poor in marginal or depleted environments who benefited little from Green Revolution technologies



First, the types of farmers whose needs we primarily address are the poor in marginal or depleted environments who benefited little from Green Revolution technologies. These are primarily areas with degraded soils, degraded forest lands, areas where agroforestry capacity is lacking, and in certain difficult ecological zones where trees can make a particularly significant impact in terms of food and income security to farmers, such as in the Sahel.

Second, NRM research includes beneficiaries other than farmers, such as community-level land-users, national and global policy-makers, and the concerned public.

Third, this approach focuses on heterogeneous environments, which require a flexible range of management options and where 'all-encompassing' technologies cannot be successfully applied in a blanket fashion.

And fourth, it builds upon the production and ecosystem service functions that natural capital fulfils in agriculture. Such functions increase productivity while ensuring the stability of these increases.

NRM deals with the sustainable use of the resource base of agriculture. Its objectives are twofold: to meet the production goals of farmers, such as crop yields and profitability, as well as to meet the goals of the rest of society, such as increasing the welfare of current and future generations and preservation of the environment. By the resource base of agriculture, we mean all the natural resources essential to agricultural production, such as soil, water, solar energy, plant and animal germplasm.

ICRAF's research objectives:

- to generate new knowledge on the functions of trees in relation to agricultural productivity and ecosystem services, which is essential to the design and adoption of agroforestry innovations that help reduce poverty, food insecurity and protect the environment
- to apply this knowledge to improve decision-making, policy formulation and implementation to facilitate the achievement of the above

The research agenda encompasses seven components:

1. Problem-driven priority setting. This entails the identification and quantification of key poverty and natural resource management problems, their driving forces and opportunities for agroforestry solutions. This component goes beyond the traditional diagnosis and participatory rural appraisals in that it embodies an analysis of the root causes of resource and poverty problems with policy partners and a prediction of future trends of these driving forces. Two highly relevant problems include an understanding of the role of women — their lack of access to land tenure, their role as effective heads of household in many smallholder farm families,

and their lack of access to primary education — and an appreciation of the impact of AIDS on productivity, directly, through the health of farmers, and indirectly through the resources that must be devoted to caring for the victims.

2. Enhancing the income and food functions of agroforestry trees. Activities focus on enhancing the food (fruits), energy (fuelwood), raw materials (building poles) and income functions of priority agroforestry trees. The questions addressed are how can tree species with a high commercial value (*Prunus africana*), or those which contribute to food security (indigenous fruit species such as the bush mango), be transformed into tree crops through manipulations of genotype, environment and management. This includes developing techniques for tree domestication and identifying new suitable species, as well as improving methods for seed and vegetative propagation.
3. Improving the ecosystem services of agroforestry trees. This entails devising, quantifying and modelling improvements in key ecological functions of agroforestry. Examples of these functions are soil fertility replenishment, erosion control, watershed hydrology, enhancement of agrobiodiversity and carbon sequestration.
4. Balancing trade-offs among agricultural and environmental objectives. Activities focus on analysing trade-offs between income and ecosystem functions and testing the resulting management options. Improvements in the income and ecosystem services of agroforestry options generate different net benefits for various categories of stakeholders. It is therefore essential that trade-offs between the interests and perspectives of the main stakeholders be analysed in order to identify options that will minimise conflicts.
5. Facilitating conflict resolution between farmers' interests and the interests of other groups. This is done through participatory policy analysis with a range of stakeholders, including community-level leaders. For example, farmers are unlikely to consider the increased carbon sequestration of complex agroforestry systems in the humid tropics as a benefit, while society at large is much more likely to consider such benefits as significant. Conflict resolution in such a case probably involves the design of policy instruments and institutional arrangements that enable farmers to better capture some of the environmental benefits they generate.
6. Implementing policy research and identifying geographical areas for extrapolation of results. This entails developing and monitoring policy implementation mechanisms and institutional arrangements, and modelling of baseline data about key poverty and natural resource management problems. It is then possible to extrapolate the results obtained from pilot projects where ICRAF's Development Division is involved to other geographical areas that share similar biophysical and socio-economic constraints.

NRM deals with the sustainable use of the resource base of agriculture

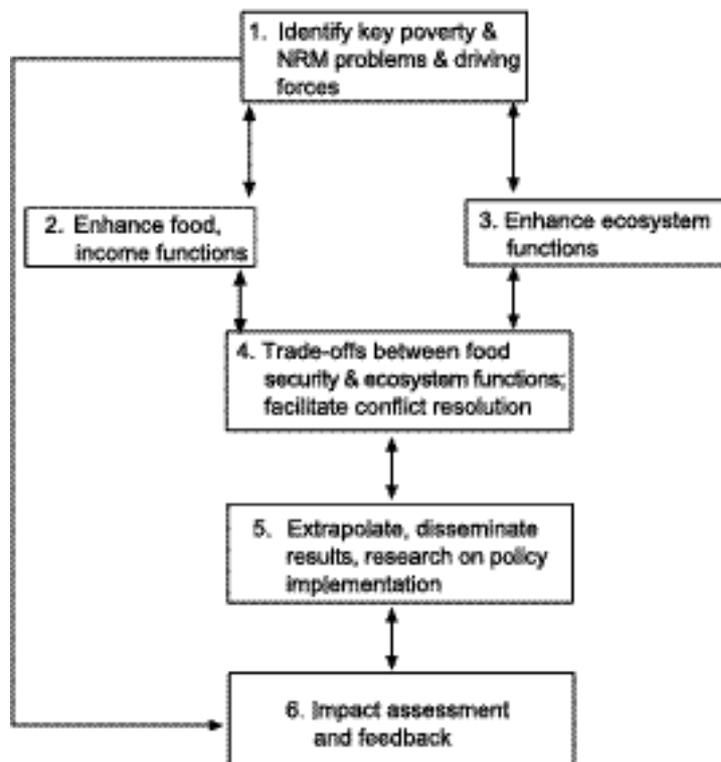


7. Assessing impact and feedback from pilot projects. This encompasses monitoring the adoption of agroforestry innovations in pilot projects. Specific ecological, economic and social parameters are monitored so that the overall impacts of adoption of agroforestry options can be assessed for farmers as well as for the general society. Results provide strategic information to researchers on the effectiveness of the innovations they have devised and on their adoptability.

These seven components are carried out sequentially. They are interdependent and linked through iterative loops (Box 8). The full set of products and outputs they generate ensures the fulfilment of the research objectives and ICRAF's mission. The methods used to implement these generic activities are participatory and involve a range of partners and stakeholders in addition to farmers, in particular decision-makers at various levels.

Heterogeneity is explicitly built into this approach to capture patterns in the observed complexity and diversity of conditions. Likewise, risk and uncertainty — related to government policies, international prices, weather variability, climate change, and pest infestation — are also explicitly taken into consideration, through the analysis of ranges of flexible options in terms of their risk reduction capabilities.

Box 8. Principal components of an integrated natural resource management research agenda



To successfully implement this research agenda, we must have effective partnerships with different stakeholders, including policy-makers at different levels, from the village to the international spheres, as well as new types of collaborations with other CGIAR centres, advanced research institutions, NARS and civil society. This research agenda brings about a significant shift in emphasis and encompasses what we mean by the NRM research approach, in contrast to more traditional approaches.

Box 9. NRM research is highly strategic, not site specific

Unlike traditional tree breeding and agronomic research, which are site specific, the NRM approach described is not. It is process-based research carried out at multiple geographical scales, and it provides a predictive understanding that can be extrapolated across the globe. Such research delivers international public goods.

Development

In a departure from traditional CGIAR methods of disseminating knowledge and technologies — that is, a reliance on networks, publications and training as the principal vehicles of ‘technology transfer’ — ICRAF’s research and development continuum allows the Centre to assume a more hands-on, proactive role in identifying, understanding, facilitating and catalysing agroforestry-based opportunities for greater adoption and impact.

ICRAF took this unconventional step in 1998, first and foremost because the impact of NRM research has in the past been limited and sporadic, suggesting that traditional Green Revolution approaches to research and development have not always been appropriate. As we move beyond the ‘food bowls’ of Asia to meet the challenges of more complex, heterogeneous, often-marginal environments, more site-, farmer-, and community-specific solutions are required. To better understand these circumstances, we need to be closer to policy-makers and our clients — smallholder farmers and those change agents who work with rural communities — in order to test, adapt, and share innovations. Because of this approach, we are confident that our research will be more relevant to the real needs of, and opportunities for, the agricultural poor.

We also believe that by directly engaging in the development process through strategic partnerships our impact on poverty reduction and environmental protection will be realised more quickly and on a greater scale than it would if we took a more passive approach that has typified the position of CGIAR centres — including ICRAF — in the past. The developing world has no shortage of successful pilot projects that have demonstrated the potential to meet rural people’s needs. But these often well-publicised success stories rarely have the anticipated broader-scale impact, precisely because it is assumed that it is the responsibility of ‘others’ to scale up the results. There is a clear discontinuity in this train of thought and actions in the research and

To successfully implement this research agenda, we must have effective partnerships with different stakeholders, including policy-makers at different levels



development continuum. For this reason, we are convinced that research organisations like ICRAF must take a more proactive role in understanding, facilitating and catalysing the process of ‘scaling up’.

We strongly believe in the need for more relevant research and greater and earlier impact. We see ICRAF as an institutional model for national and international research organisations. The integration of research and development responsibilities again departs from traditional institutional approaches that separate research and extension. Such models served well where straightforward genetic improvements in food crops were the principal innovations, and large relatively homogeneous farmlands were the targets of research and development. The logic of a more integrated approach is compelling but the actual field experience remains limited, at least within the agriculture sector. The ICRAF approach aims to serve as an institutional experiment to be critically examined for its effectiveness vis-à-vis other approaches.

ICRAF has chosen to engage in development through partnerships. Our comparative advantage has been and remains in the application of science to development through agroforestry. We have no intention of competing with specialised institutions that have experience and expertise in development. Instead, we want to add value to their work through our strategic participation in development efforts. From our position as one of the scientific leaders in integrated natural resource management, with unique global knowledge and experience on the integration of trees in farming systems and rural landscapes, we can make important contributions to the efforts of others, and at the same time, enhance our own efforts to undertake relevant, high-impact research.

We are focusing on eight key components where we believe we can best contribute to development as a research institution:

1. **Strategic alliances.** ICRAF is forging creative new alliances with organisations that have complementary expertise, resources and geographical access to generate adoption and impact on a large scale. Partners include NARS, national extension agencies, national planning and policy agencies, the private sector, development banks, bilateral development agencies, universities, schools, NGOs and farmer organisations.
2. **Innovation assessment.** To generate direct on-the-ground impact through agroforestry, we first assess the adoption potential of innovations. This process usually requires on-farm research — both biophysical and socio-economic — and the design and implementation of pilot development projects. The latter serve as field laboratories that help define the potential scope and resource requirements for wide-scale adoption and impact. In assessing innovations, particular attention is being placed on their impact on women.

3. **Germplasm supply.** The lack of seed, seedlings, and other planting material is frequently identified as the most important constraint to greater adoption of agroforestry. Dependence of farmers on relatively ineffective public and/or private sectors has often ended in disappointment. Our goal is to develop and apply better methods of forecasting germplasm needs, and to facilitate establishment of effective, low-cost, sustainable, community-based germplasm production and distribution systems.
4. **Market development.** Markets for agroforestry products provide the basis for income generation for poor farming households. We envisage several key roles for ICRAF in marketing research and development. In particular, we see an opportunity for ICRAF, in partnership with others, to serve as a knowledge broker, thereby helping link agroforestry producers in the South with potential processors and consumers in the North and in the South.
5. **Policy dialogue.** Public policy decisions can profoundly affect the uptake and impact of natural resource management innovations. The 1998 CGIAR System Review and the CGIAR Strategy for Sub-Saharan Africa both highlight the importance of policy research and dialogue in bringing about a better enabling environment. In the coming years, ICRAF will increase efforts to facilitate and catalyse policy change through formal dialogue with policy- and decision-makers.
6. **Knowledge sharing.** The rapid advance of agroforestry as both a science and practice has resulted in a substantial global knowledge base. But this knowledge base remains inaccessible to many of those who need it most: national researchers, field-level extension and development workers, policy-makers, school teachers and students, and farmers. Our challenge is to move this information ‘off the shelves’ as quickly and as effectively as possible and transform it into knowledge. To this end, we plan to establish an agroforestry knowledge centre, in collaboration with other organisations that share this mission.
7. **Capacity building.** Our success critically depends on the capacity of individuals and institutions that collaborate with ICRAF at various points along the research to development continuum. ICRAF has devolved some of its basic agroforestry courses to leading African and Asian universities, allowing us to focus on more frontier type in-service training of collaborators. Our highly successful agroforestry education networks with over 100 universities and technical colleges in developing countries have permitted this devolution. We are continuing efforts to enhance the sustainability of agroforestry research and development institutions. But an important innovation in capacity building is a “Farmers of the Future” programme. Through this initiative we will explore, initially on a pilot scale, the use of primary schools as means of reaching current and future generations of farmers. Special attention will be given to increasing the participation of women in all capacity-building activities.

Markets for agroforestry products provide the basis for income generation for poor farming households

8. **Technical support.** As with published information, the knowledge and skills base of individuals can have a transformational effect in providing crucial technical advice. ICRAF envisages an on-going role in mobilising and providing technical expertise in support of scaling-up adoption and impact. We will also mobilise technical expertise from other organisations, including our national partners, to support agroforestry development.

Box 10. The development agenda in a nutshell

- departs from traditional CGIAR approaches to disseminating knowledge and technologies
- addresses the unique challenges of scaling up the use of NRM innovations
- forges creative new alliances with organisations with complementary expertise, resources, and geographic access
- improves understanding of research–development pathways
- facilitates greater adoption and impact

A major challenge over the coming one to three years will be to build capacity within ICRAF in a number of non-conventional fields that are essential if we are to function as a credible development partner. These fields include market development, germplasm supply, institutional innovation, public health, gender analysis, and monitoring and evaluation.

Management Services

ICRAF will expand its human and financial resources and add to and modify its regional programmes to internalise this strategy. We will have to make hard choices about where and how to expand as well as where and how to reduce our activities, in light of the availability of resources and the capacity of our partners. This is a highly dynamic process and it includes the accountability dimensions indicated in the 'goals' section. Our vision, mission and values provide the general criteria for making those hard choices.

Specifically, the Management Services Division (MSD) supports the efforts of ICRAF's scientific staff by providing a strong, flexible and diversified human and financial resource base. Our main objectives are to

- ensure a creative, diverse, and secure work environment
- facilitate the evolution of ICRAF as a learning institution
- engage in proactive resource mobilisation that maintains and builds upon well-established relationships with our investors

ICRAF's priority-setting mechanism is its annual Programme of Work and Budget, which is presented in November-December to the Board of Trustees for approval. This detailed document serves as the basis for the Centre's rolling three-year Medium-Term Plan, which is

submitted to the Technical Advisory Committee (TAC) of the CGIAR for endorsement each March. We are in the process of institutionalising performance-based management, including budgeting, monitoring, and staff performance evaluation.

ICRAF is above all about people. We expect the institution to grow, both in numbers and in the range of disciplines represented by our staff. This presents a challenge, one compounded by our determination to increase the diversity of our staff, especially in terms of gender and representation from the South. We host the CGIAR Gender and Diversity Programme, and are working to introduce and cultivate values and cultural norms that will make the Centre more 'diversity friendly'. The Centre actively seeks to strengthen the skills of its staff at all levels and in all locations, in large measure to improve the effectiveness of the organisation, but also to maintain ICRAF as an attractive, competitive employer.

Our resource mobilisation objectives are ambitious, almost tripling our budget by 2010. We must cultivate and strengthen our relationships with present investors (the CGIAR members) who continue to be the mainstay of our resource base. The nature of those partnerships is changing, however. Traditional investors foresee only modest growth, at best, and the trend toward earmarking funds from these sources is likely to continue. Increasingly, our challenge is to find funds for our core research and development functions. Therefore, we must learn about, cultivate and tap new sources of support: new traditional investors, especially foundations, individual and cause-related giving, and social enterprise. This is being done through strategic partnerships with institutions like the Public Strategies Group and the National Arbor Day Foundation. As we cultivate new sources of support, we must also reassure our traditional financial partners that, as a result of those new funds, their past, present and future investments in ICRAF will have additional leverage, that there are tangible synergies between traditional and non-traditional funding sources.

A prerequisite for successful resource mobilisation is sound and transparent financial management, and the efficient and effective use of funds invested in the Centre's work. MSD is responsible for ensuring transparency and for monitoring the effective use of resources. The Centre is streamlining its work in this area with on-line computerised financial management and workflow systems.

MSD also provides support to the Centre in the rapidly changing field of information technology. Costs in this area will continue to fall even as demand for all kinds of information technology services continue to increase. The Internet will increasingly become a key two-way portal to the world and a cost-effective tool for reaching — and strengthening — our partners. Moreover, advances in remote sensing and geographic information technologies will allow ICRAF to operate on a wide range of scales, from watershed and landscape levels down to individual plots, and thus enable us to bring to bear the strategic science of integrated natural resource management in ways that increase agricultural productivity and protect the environment.

ICRAF hosts the CGIAR Gender and Diversity Programme, and are working to introduce and cultivate values and cultural norms that will make the Centre more 'diversity friendly'



MSD provides this range of services to the ICRAF Board of Trustees, ICRAF management and staff worldwide; the governments of Kenya and the 12 other countries hosting ICRAF staff; the investors to our Centre; the 10 hosted institutions located on ICRAF's Nairobi campus, and other scientific institutions and universities which utilise our facilities and with whom ICRAF has various types of strategic alliances.

Governance

Effective governance has been and must continue to be a key contributor to ICRAF's success. Just as ICRAF is changing so will its governance. ICRAF's Board of Trustees recognizes that ICRAF's strategy, with its emphasis on high-quality science and significantly increased impact on the world's agricultural poor, may require changes in the Board's composition, structure and operation. The Executive of the Board has the responsibility and will complete a review of the Board to identify how it can best contribute to ICRAF's success in the future. In collaboration with the Resource Mobilization Committee it will also explore the creation of new institutions — such as a 'Friends of ICRAF' council — to assist the Board of Trustees in its work.

The Board of Trustees' mandate:

- advocate the interests of ICRAF's direct clients — the agricultural poor — in all aspects of ICRAF operations, and to our national and global stakeholders
- assist in resource mobilisation
- provide direction to management on strategic policy issues
- assess the fiduciary responsibility for the correct expenditure of funds received
- recruit and evaluate the Director General

The Board of Trustee's mandate includes advocating the interests of ICRAF's direct clients — the agricultural poor



Structure — our operational matrix

ICRAF continues to operate in the context of a matrix in which five thematic programmes cut across five strategically chosen regions (Box 11). Each programme has a programme leader, and each region has a regional coordinator. As in any matrix structure, one side of the matrix carries the lead authority and responsibility to avoid a scientist being directly responsible to more than one person. From 1991 to 1997, the thematic programme leaders carried such authority and responsibility because of ICRAF's need to transform itself into a strategic research institution. As this goal was essentially achieved in 1998 these duties were transferred to the regional coordinators in order to emphasise impact generation.

For administrative purposes, Programmes 1–3 are overseen by the director of research and include the strategic work on natural resource strategies and policies (Programme 1), the domestication of high-value agroforestry trees (Programme 2), and ecosystem rehabilitation (Programme 3). Advancing impact and innovation (programme 4) and training and education (programme 5) are overseen by the director of development.

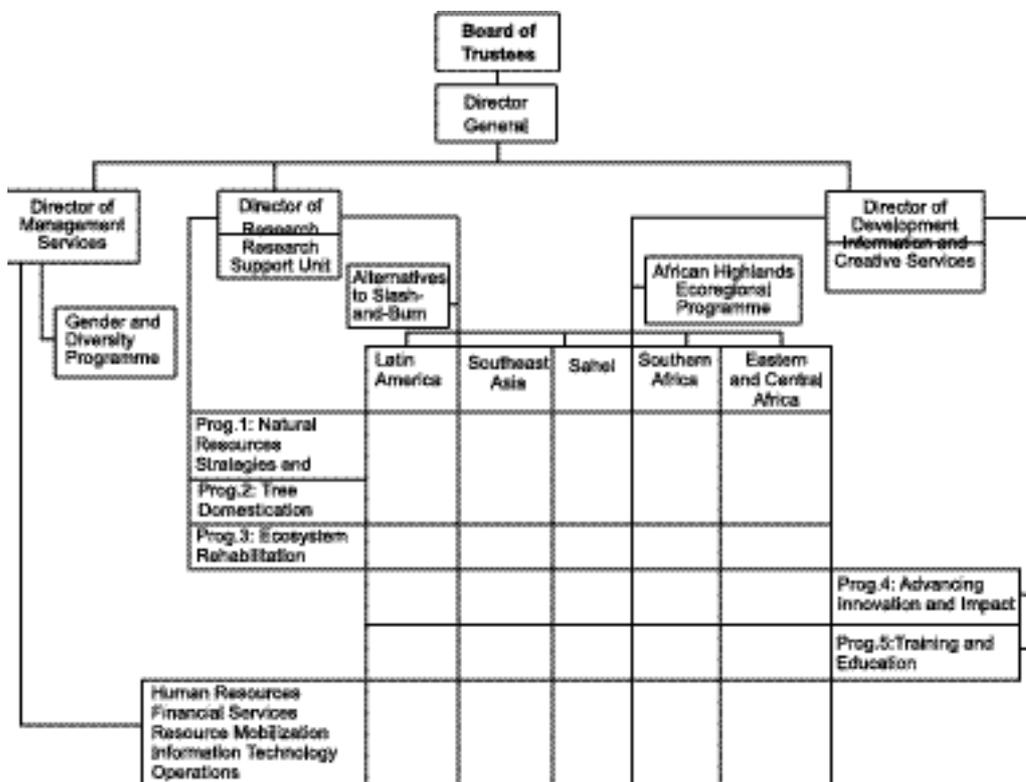
Each of these two directors also has the administrative responsibility for overseeing the work managed by the regional coordinators. The director of research works with the coordinators of activities in Southeast Asia and Latin America, and the director of development works with coordinators managing our work in Southern Africa, Eastern and Central Africa, and in the Sahel. Each of these directors also has responsibility for one system-wide programme convened by ICRAF on behalf of the CGIAR. The Alternatives to Slash-and-Burn falls under the purview of the director of research, and the director of development oversees the African Highlands Ecoregional Programme (AHI). Each director also oversees a support unit: Research Support (RSU) by the director of research, and the Information and Creative Services Unit (ICSU) by the director of development.

The Management Services Division provides managerial and administrative support to all programmes as well as to the five different regions, and the director of MSD has administrative oversight for the third system-wide programme hosted by ICRAF, the Gender and Diversity Programme.

The director general has overall responsibility for leading and managing the Centre. An executive officer, a protocol officer and the internal auditor support his functions. Decision-making is generally by consensus and is normally done during meetings of the Management Committee, made up of the director general, and the directors of research, development and management services.

A matrix approach to management is inherently complex and carries with it a certain amount of dynamic tension. It has, however, proven to be an effective method for managing ICRAF's work and, perhaps because it naturally engenders an atmosphere of give-and-take among geographical regions and thematic programmes, it has contributed to a number of creative solutions to complex research and development problems, as well as innovations in management itself.

Box 11. ICRAF's organisational structure



A matrix approach has contributed to a number of creative solutions, such as improved living fences to protect dry season gardens in the Sahel



Geographic focus

During its first decade, ICRAF's research, information and training activities were focused on sub-Saharan Africa. Upon joining the CGIAR in 1991, the Centre assumed a more explicit global mandate and expanded to Southeast Asia and Latin America through our participation in the Alternatives to Slash-and-Burn Programme. The West Africa humid tropics regional programme was devolved to a sister centre in 1998, when it developed the comparative advantage. Our activities in this region now focus on the domestication of indigenous trees. By 2000, therefore, ICRAF had emerged as a highly decentralised research and development institution with active regional programmes in Eastern and Central Africa, Southern Africa, the Sahel, Southeast Asia and Latin America.

Box 12. ICRAF's current geographical coverage

Regional Programme	Headquarters	Countries
Southern Africa	Harare, Zimbabwe	Zimbabwe, Zambia, Malawi, Tanzania , Mozambique
East and Central Africa	Nairobi, Kenya	Kenya, Uganda, Rwanda , Tanzania, Ethiopia, Madagascar
Sahel	Bamako, Mali	Mali , Burkina Faso, Niger, Senegal
Latin America	Pucallpa, Peru	Peru , Brazil, Mexico
Southeast Asia	Bogor, Indonesia	Indonesia, Thailand, Philippines , Vietnam, Laos

Countries in boldface have ICRAF senior staff stationed.

In developing a more explicitly poverty-focused strategy for 2001–2010, it is apparent that we must reassess our regional priorities and our rationale for continuing in different regions. The case for agroforestry research and development in reducing poverty in our three African regions and in Southeast Asia remains compelling and central to our mission. In Latin America, the case for continuation as a priority region is greatly strengthened by the potential role for agroforestry in providing environmental benefits, especially at the regional and global levels. However, the case for impact on poverty in Latin America will depend on our ability to generate and deliver agroforestry options for the agricultural poor.

The most obvious gaps in our current geographical priorities are South Asia and China, both of which are major foci of rural poverty.

The dramatic numbers of poor farmers agroforestry can help are a powerful argument for ICRAF involvement in these areas.

Therefore ICRAF will, in the medium-term, move into these areas, establishing a new regional programme in South Asia, and engaging with southern China where agroforestry is high priority as part of our current Southeast Asia regional programme. In the meantime ICRAF is making the necessary preparations to be able to do this. This includes identifying suitable partners, most promising agroforestry innovations and an understanding of the policy environment, and securing sources of funds.

Semi-arid Latin America, including Northeast Brazil, portions of the tropical Andes and of Central America also constitute a major locus of agricultural poverty that could also benefit from more direct ICRAF involvement. In this strategy, we plan to correct this imbalance by developing new types of programmes at these important locations, linking them with existing humid tropical sites where ICRAF currently works as an expansion of our Latin American region. This recognises the important socio-economic and migratory links that exist between these linked but ecologically different areas (Northeast Brazil–Amazonia; Sierra-Selva in Peru, the forests of Mesoamerica and the drier hillsides of Central America). In doing so we recognise major differences with respect to NARS capacity and the existing institutional settings.

The case for impact on poverty in Latin America will depend on our ability to generate and deliver agroforestry options for the agricultural poor



Impact — what this strategy will deliver

ICRAF's corporate strategy provides an overall institutional framework bringing together diverse skills to address common problems. It comprises the big picture of ICRAF: who we are, why we exist, what we do in general terms, how we do it, and to what end. We believe that the implementation of this corporate strategy, coupled with the more specific, divisional, regional and programme strategies will produce direct impact on the physical, political and social environments of many different categories of people:

- hundreds of policy-makers and decision-makers in the same countries and in international organisations such as our co-sponsors FAO, World Bank, UNDP, UNEP as well as CARE, World Vision, and other actors in civil society who are provided with the relevant information and tools to create a favourable policy environment for farmers and land managers the world over
- thousands of scientists in 'the North' who can continue to benefit from methods and approaches described in ICRAF's scientific publications
- thousands of scientists in developing countries where ICRAF has direct and indirect influence — in NARS, universities, NGOs — who are empowered, through capacity-building and collaborative partnerships to use the most appropriate agroforestry options to impact directly on the livelihoods of their countries
- millions of agricultural poor who are given the means to adopt agroforestry innovations, becoming food secure and no longer poor
- billions of world residents who will benefit from improved global environmental conditions resulting from the adoption of agroforestry innovations that result in less deforestation, more carbon sequestration, more biodiversity, and less desertification in semi-arid environments

The reason why the ICRAF Board, management and staff believe that these impacts will take place, is based on our key success factors (Box 13), some of which we already have and others that we expect to acquire in the next decade.

Box 13. Key success factors

Already have and must maintain:

- a compelling agenda, combining food security and poverty reduction with environmental protection
- high quality, committed and diverse staff
- an NRM research approach
- established scientific and managerial credibility
- a strong partnership track record
- a team-based learning institution

Need to acquire:

- ample farmer access to planting materials of improved agroforestry trees
- effective delivery pathways to areas beyond where we work
- diverse and stable resources to support current and future endeavours

ICRAF needs to ensure that farmers have ample access to planting materials of improved agroforestry trees



Implementing the strategy

What follows describes the human, information and financial resources required to implement the strategy — in other words how to move from a 22 to a 60 million-dollar organisation in 10 years. In broad terms we will scale-up ICRAF based on key principles and assumptions previously outlined (Boxes 1, 4, 7, 8, 9, 10 and 13). The point of departure is our Board-approved 2000 Programme of Work and Budget.

Staff and operational resource requirements

The additional resource requirements in terms of staff and operations are described in narrative form specifying what the incremental needs will be by 2010. They are net of activities to be discontinued, and quantified in Table 1 on a yearly basis. We also assume an inflation rate of 3% per year for this decade, and present all amounts in nominal dollar terms. Figure 1 shows the pattern of resource requirements in terms of global research and development (R & D), regional R & D and management requirements. Table 2 summarises the staff requirements for 2001, 2005 and 2010. They are expressed in internationally recruited staff equivalents, but the position could be also filled by a number of nationally recruited professionals. Figure 2 shows the time course of the regional activities. These time graphs indicate that some activities will start earlier or later than others, none of them being static or showing linear growth.

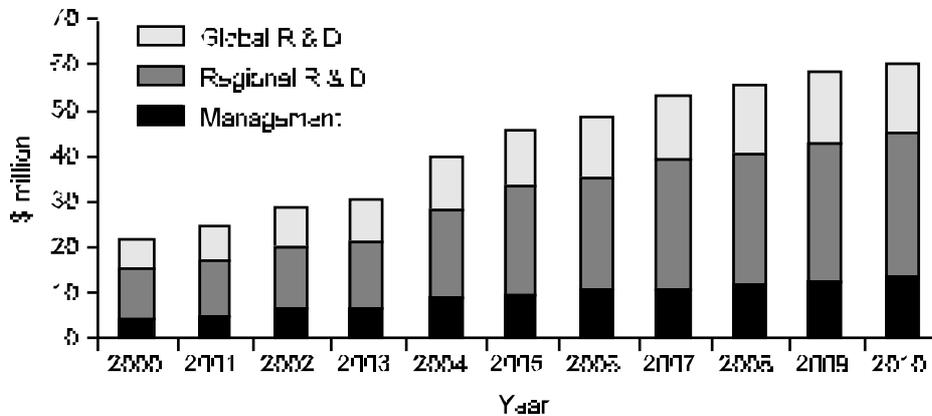
Global research and development (\$ US16 m /yr by 2010) Global R & D consists of all research and development activities that operate at the global scale, based mostly but not exclusively at ICRAF headquarters. Global R & D includes scientific and technical support to the regions and inter-regional synthesis. It also includes two systemwide programmes, Alternatives to Slash-and-Burn and the Gender and Diversity Programme.

Table 1. Resources required by ICRAF for 2000–2100 (in million \$)

Activity	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Global R&D*	5.8	7.2	8.8	9.3	11.4	12.0	13.2	14.5	15.0	15.5	16.0
Regional R&D:	11.0	11.9	13.0	14.2	19.6	23.5	25.0	27.7	28.7	29.6	31.0
Eastern/Central											
Africa	4.1	4.2	4.4	4.6	5.2	5.7	6.1	6.5	6.7	6.9	7.0
Southern Africa	2.5	2.7	2.9	3.0	3.9	4.5	4.7	5.3	5.5	5.6	6.0
Sahel	0.6	0.8	1.0	1.2	1.9	2.5	2.6	2.7	2.7	2.8	3.0
SE Asia	3.0	3.2	3.4	3.7	4.5	5.3	5.6	6.3	6.5	6.7	7.0
Latin America	0.8	1.0	1.3	1.4	2.2	3.0	3.3	3.6	3.8	3.9	4.0
South Asia				0.3	1.9	2.5	2.7	3.3	3.5	3.7	4.0
Management	4.3	5.6	6.5	6.5	8.3	9.5	10.0	10.8	11.3	12.4	13.0
Total	21.1	24.7	28.3	30.0	39.3	45.0	48.2	53.0	55.0	57.5	60.0
% Global	27	29	31	31	29	27	27	27	27	27	27
% Regional	52	48	46	47	50	52	52	52	52	51	52
% Management	21	23	23	22	21	21	21	20	21	22	22

*Global R & D and Management would initially increase at a higher rate than Regional R & D, then would plateau, to ensure sufficient scientific and managerial competency for subsequent support of regional R & D.

Figure 1. Time course of ICRAF requirements split by main activities



Additional human, information and financial resources are required to implement the strategy



The principal components needed by 2010 are:

- strengthened capacity in research methods for watershed-scale analysis and integration of biophysical and socio-economic data at this particular scale
- achieved capacity in policy research aspects related to global environmental benefits of agroforestry, particularly carbon sequestration and agrobiodiversity conservation, and strengthened biophysical capacity in these two aspects as well. This positions ICRAF well in dealing with the relevant global conventions and fora
- strengthened capacity in two social science areas that are key to the understanding of farmers' needs and objectives (problem identification) and of the social impacts of agroforestry (impact assessment), namely, rural sociology and anthropology
- strengthened service dimension of our GIS/remote sensing laboratory to ensure that problem identification is indeed systematically undertaken in all of ICRAF's regions and that they have direct access to all GIS databases
- strengthened service function of the tree domestication laboratories, including the germplasm resource unit, the seed physiology laboratory and the central nursery, to make sure that strategic research on tree improvement and propagation continue to be first-rate, as well as being able to address the needs of all regions
- strengthened capacity in molecular studies, biotechnology methods and agrobiodiversity to ensure that our domestication activities address not only issues of poverty reduction through high-value trees but also issues of germplasm and species biodiversity conservation and management by farmers
- strengthened capacity in hydrology, production ecology and soil biology (including the combined use of organic and mineral inputs) in order to more effectively address issues of improving key ecosystem services of agroforestry systems, in particular at the watershed scale
- strengthened capacity of our soil and plant laboratory to provide service and training to the African regions and develop cutting-edge but robust methods such as sensing soils from space
- demonstrated capacity to undertake applied research and technically support the regions in seven key development-related areas: germplasm supply, market development, extension, institutional innovation, monitoring and evaluation, gender analysis, and development communication
- an established state-of-the-art Agroforestry Knowledge System to enhance access of agroforestry and related NRM data, information and knowledge to research and development partners

- an established cross-regional 'Farmers of the Future' education programme that will work through schools to increase awareness and disseminate agroforestry information among children, while maintaining the university programme
- expansion and adaptation of the successful Landcare approach from the Philippines to other countries in Asia, and to Africa and Latin America
- established strategic alliances and operational partnerships with several major development-oriented institutions, including international development banks, international NGOs, and bilateral investors

Table 2. Staff requirements by discipline in 2001, 2005 and 2010
Numbers are expressed in internationally recruited staff equivalents

Discipline	2000	2005	2010
Tree sciences:	6	13	17
Genetics	2	3	4
Vegetative propagation	2	2	3
Molecular studies	1	2	2
Biodiversity	0	3	5
Seed multiplication	0	1	1
Domestication	1	2	2
Other biophysical sciences	15	21	21
Soil science	7	5	5
Ecology	3	7	7
Agronomy – agroforestry	4	5	5
Hydrology	0	2	2
Modelling	1	2	2
Social sciences	7	14	15
Economics	6	8	8
Anthropology	1	1	1
Geography	0	1	1
Sociology	0	2	2
Gender	0	1	1
Marketing	0	1	2
Dissemination	1	5	7
Research Support (biometrics and methodology)	2	3	3
Information & Creative Services	2	4	6
Training and Education	2	3	3
Management	20	23	24
Senior Management (directors + executive officer)	5	5	5
Regional coordinators	5	6	6
Programme leaders	5	5	5
Heads, Management Services Unit	5	5	5
Resource mobilization	0	2	3
TOTAL	54	81	89

By 2010, ICRAF will strengthened service function of the tree domestication laboratories



Regional R & D (US \$31 m/yr by 2010)

This includes all research and development activities operating at the regional scales. For example the AHI is included in East African region. The focus is on the numbers of agricultural poor that ICRAF and its partners would have helped lift themselves out of poverty. The starting point is the current five regions. An additional region (South Asia) is scheduled to begin operations in 2003. The scope of another two regions will undergo a significant geographical expansion. Latin America will expand to cover areas outside of the humid tropics that have high potential for agroforestry and poverty alleviation. Southeast Asia will expand to cover the parts of tropical China. Tree domestication in humid West Africa will continue as an outreach project of Programme 2 with support from Programmes 4 and 5.

East/Central Africa: US \$7 m/yr by 2010. Target: 27 m poor

- establish a major collaborative agroforestry research and development programme in Ethiopia, with clear impacts both on policy and biophysical dimensions. The regional coordinator's office will be moved to Addis Ababa, Ethiopia
- strengthen the current programmes with Kenya, Uganda and northern Tanzania, intensifying collaborative research with NARS and NGO partners, and participating actively in the design and support of multilateral and bilateral investment projects
- strengthen programmes in Rwanda, Burundi and Madagascar, focusing initially on capacity building
- engage in eastern Congo, conditions permitting
- enhance regional capacity in marketing and tree germplasm and seed supply
- expand the scope of the research and development agenda to include semi-arid areas and urban/peri-urban agroforestry in the above countries
- continue networking among countries through the Agroforestry Research Networks for Africa (AFRENA) and AHI

Southern Africa: US \$6 m/yr by 2010. Target: 13 m poor

- establish a major country programme in Mozambique, with an initial emphasis on capacity building, and applied and adaptive research that draws on the experience within the region
- intensify research at existing regional sites in Zimbabwe, Malawi, Tanzania, and Zambia
- enhance regional capacity in marketing and tree germplasm and seed supply
- establish research in other sites in the Southern Africa Development Community (SADC) countries that represent large areas of poverty where agroforestry may contribute

- enhance capacity in agrobiodiversity, in particular in the context of the miombo woodlands
- strengthen regional dissemination efforts through partnerships with government extension agencies, NGOs, development projects, education and health ministries and the private sector
- strengthen collaboration with South Africa to draw on its academic, scientific, and technical expertise, and the supply of tree germplasm

Sahel: US \$3 m/yr by 2010. Target: 11 m poor

- build a critical mass of ICRAF capacity in areas of tree domestication (including product marketing and germplasm supply), production ecology, landscape ecology, socio-economics (farm-level), policy research, and dissemination
- strengthen collaboration with other CGIAR centres, particularly with the International Centre for Research in the Semi-arid Tropics (ICRISAT), the International Plant Genetic Resources Institute (IPGRI), and the International Livestock Research Institute (ILRI), and with other research and development institutions that are active in the region
- intensify research and development efforts in Mali and Burkina Faso initially; then build adequate links with Senegal and Niger to ensure impact in those countries
- establish a bilateral programme to extend experience and impact to northern Ghana and other anglophone areas in the Sudano-Sahelian zone

Southeast Asia: US \$7 m/yr by 2010. Target: 21 m poor

- facilitate adoption of technologies and policies developed by the Alternatives to Slash-and-Burn Consortium at a large scale in forest margin areas of Indonesia, Philippines and Thailand
- establish research and development activities in Vietnam, Laos and the Yunnan and Hainan Provinces of China. Ensure our activities in Thailand embrace key issues for the Mekong Basin
- strengthen our capacity in landscape ecology and GIS to support the work on institutional arrangements and policy at the watershed scale
- build capacity in tree domestication for the region

Latin America: US \$3 m/yr by 2010. Target: 4 m poor

- facilitate adoption of technologies and policies developed by the Alternatives to Slash and Burn Consortium at a large scale in forest margin areas of Peru, Brazil and Mexico
- establish research and development activities in Northeast Brazil, the Peruvian Andes and hillsides of one Central American country, all in areas that interact socio-economically with the humid tropics. This is in response to the demands of our collaborators

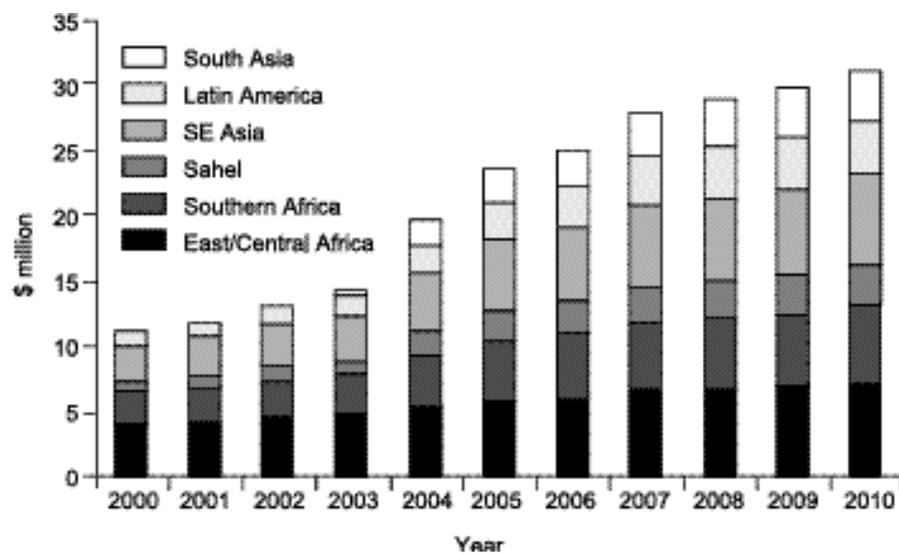
ICRAF will intensify research and development efforts in Mali and Burkina Faso

- build capacity in dissemination and training for the region
- develop an agroforestry education network like ANAFE and the South East Asia Network for Agroforestry Education (SEANAFE)

South Asia: US\$4 m/yr by 2010. Target: 4 m poor

- establish a South Asian regional programme that will focus on Bangladesh, the humid lowlands of eastern and southern India, Sri Lanka, Himalayas, Nepal and parts of semi-arid India

Figure 2. Time course of R & D requirements by region



Management (US \$13 m/yr by 2010)

In support of the global and regional programmes, this category encompasses the Board of Trustees, office of the director general, the Management Services Division and the offices of the directors of research and development. Also included are depreciation and contributions to working capital. All functions currently amount to 29% of the research and development budgets, or 22% of ICRAF’s total budget (as shown in Table 1) and constitute the overhead costs of ICRAF’s business, which has been judged as efficient by the 1998 EPMR. We will strengthen our governance, senior management and management service capacity as we grow in our research and development activities during this decade, while maintaining similar percentage of overhead costs. During this decade

- all ICRAF units are connected by state-of-the-art information technologies, as well as with key partners along the research –to–development continuum
- each regional office has sufficient professional staff to manage the finance, human resources, information and resource mobilisation functions, and each country office sufficient local staff to facilitate these functions
- the gender and diversity mix of ICRAF’s staff composition reflects

the supply in the international market, partly as a result of a visiting scientist project

- MSD at ICRAF headquarters has sufficient professional capacity in finances, operations and human resources to support a larger operation
- MSD at headquarters has a significantly enhanced resource mobilisation capability with specialised international staff
- the “Trees of Change™ Campaign,” is well established to raise the profile of, and mobilise significant resources for, global and regional agroforestry research and development. This campaign will draw on the knowledge and skills of an advisory council, comprising global opinion leaders from both the public and private sectors, who provide leadership and access on the resource mobilisation front
- strengthened director general’s capacity to manage ICRAF and to ‘sell’ agroforestry and the Centre to a host of existing and potential new investors
- strengthened ability of divisional directors to manage expanded operations

Financial requirements

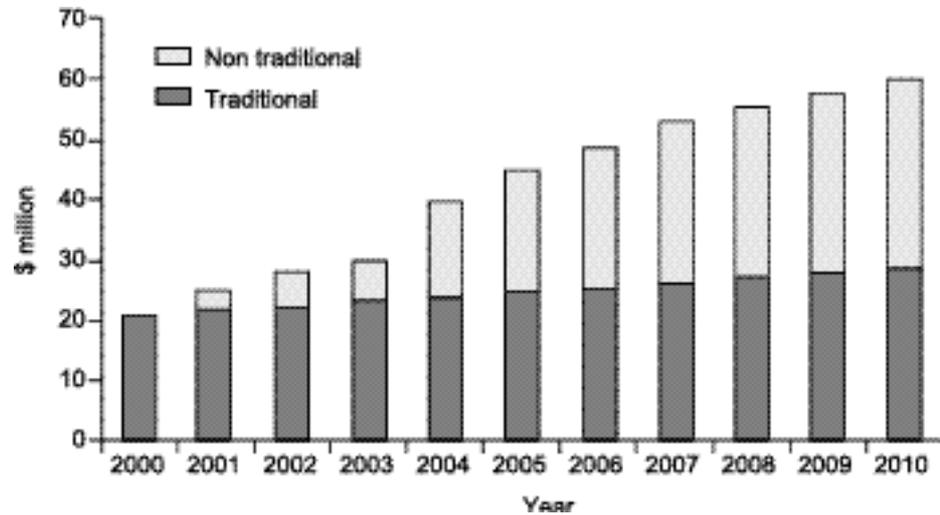
The annual funding requirements to meet the staff and operational requirements are expected to increase from the current US \$ 21 m to US \$ 60 m by 2010 (in nominal terms). The projected time course is shown in figure 3. Given the time lag when dealing with trees we envision a fast growth rate for the first half of the decade, decreasing afterwards. The centrepiece of this strategy is that the current investors (the CGIAR members) will continue to solidly fund the centre in constant terms, hence showing an assumed increase due to inflation of 3% per year. Non-traditional funds are expected to contribute an increasing proportion of the total, reaching about 50% by 2007. The non-traditional sources include additional investors from the public sector, individual philanthropy, new foundations and social enterprise.

Achieving the vision and set of interrelated goals described in this strategy will require broadening, diversifying and deepening the Centre’s financial resource base. At present, about 25% of ICRAF’s financial supporters provide about 80% of its resources, leaving the centre in a fragile situation if any of these key institutional investors are unable to meet their commitments. An integral part of our longer-term solution to resourcing the Centre’s work is to make sure we pay very close attention to those investors who provide the bulk of our current resource base. We also need to pay attention to the needs of the 75% of our investors who contribute the remaining 20% of our resource base, but in doing so we need to recognise the potentially significant opportunity costs associated with those efforts.

ICRAF will facilitate adoption of technologies and policies developed by the Alternatives to Slash-and-Burn Consortium at a large scale in forest margin areas of Indonesia, Philippines and Thailand



Figure 3. Projected financial resources by source of funding



As a first step toward achieving the needed balance, ICRAF has established three ‘flagship’ projects — major initiatives aimed at overcoming significant constraints to implementing the Centre’s agenda. The first of these is focused on mobilising resources for tree nurseries in Africa, Asia and Latin America. Germplasm is clearly a key bottleneck to greater impact in agroforestry and this project is designed to catalyse widespread implementation of sustainable community based nurseries. The second project focuses on overcoming the specific and very serious constraints faced in the Sahel, where trees are the key to survival and dramatic scaling up is needed to make a difference in that region. Third, we’re in the process of greatly strengthening our commitments in Latin America, with enhanced slash and burn research and development work serving as our primary vehicle. This flagship project is oriented around environmental issues of global concern — carbon sequestration, biodiversity, and slowing deforestation in the Amazon and Mesoamerica.

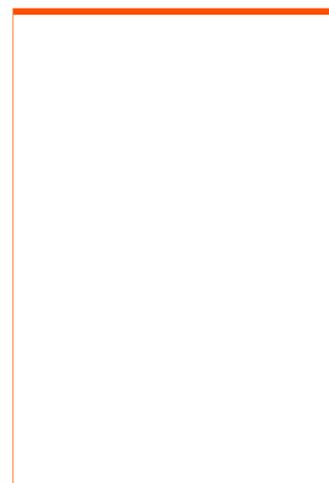
Over time, other resource mobilisation initiatives will become integral parts of a balanced resourcing plan, including cause-related marketing (social enterprise) a program aimed at sustaining earned charitable contributions and an annual major gifts campaign. We strongly believe that there are funds available to support ICRAF’s mission beyond traditional sources. The compelling nature of our agenda, our strong track record and our strategically integrated resource mobilisation strategy gives us a sense of optimism in achieving this level of resources commensurate with our vision and mission.

Conclusion

Like previous ICRAF Strategies, this one for 2001–2010 provides an overall guideline as to where the Centre is going. But it is not an inflexible cast-in-stone directive, which would be unrealistic in our rapidly changing external environment. The vision, mission, values and goals we expect to be with us for some time.

ICRAF's strategy is more than an elaboration of a vision: it is a road map which helps the institution identify the major milestones, the important obstacles and how we intend to go about overcoming them to achieve our vision. There are critical issues to be addressed in its implementation including the capturing of the necessary resources — human, information and financial — and not just to ICRAF but also to our main partners. We must also address how the organisation will change to adapt to the scale of growth, the level and timing of engagement — and disengagement — with partners, recognition and resolution of the external risk factors (such as AIDS and civil strife). These factors can affect our work, and key milestones (performance indicators) that permit us to assess whether or not we are on track to reaching our goals. We do not necessarily have all the answers to each of these issues, but we do acknowledge these issues are important and will put in place a process to be able to monitor them.

Agroforestry innovations can make a positive impact on the lives of the agricultural poor and improve the global environment



Annex 1

Rationale and justification for the number of agricultural poor included in the vision

Poverty: definitions and measures

Poverty is a complex and multidimensional concept. The best known and most often measured dimensions are:

- income poverty (measured as less than US \$1 per day per person adjusted for purchasing power differentials)
- consumption poverty (measured as food consumption below caloric requirements)
- nutritional poverty (measured as stunting in children under 5 years of age)
- asset poverty (more difficult to measure, as it encompasses natural capital, as well as human, social, financial and manufactured capital)

Over recent years, a consensus has emerged that poverty is definitely broader than income poverty and encompasses asset poverty (see World Bank paper 'Poverty Trends and Voices of the Poor', January 2000). This document indicates that the poor distinguish themselves from the non-poor in five main ways:

- the presence of hunger in their households
- fewer meals a day and nutritionally inadequate diets
- a high percentage of their meagre and irregular income is spent on food
- non-existent or low sources of cash income
- feelings of powerlessness and an inability to make themselves heard

This concept is consistent with the concepts of sustainable livelihoods (advocated by the Department for International Development (DFID), United Kingdom), livelihood security (CARE) and asset building (Ford Foundation). Concepts of risk and vulnerability are also built in this approach.

Research on the development of appropriate indicators of poverty that capture the five dimensions of poverty is under way. The Human Poverty Index (HPI) developed by UNDP is currently one of the best indicators, and it is based on measures of health, education and access to resources for maintaining livelihoods. It has the added advantage of having been calculated across more countries than most other indicators. HPI is well correlated with life expectancy, so that, life expectancy statistics can be used as a basis for deriving HPI for those countries where HPI is not directly available.

Population and poverty predictions

Population projections for all countries of the world are available from FAO. These take into account projected changing patterns of fertility and mortality and are considered one of the most reliable sources of population projections. Since ICRAF focuses on the ‘agricultural poor’ comprising farm families, other rural dwellers that depend primarily on agriculture, peri-urban and urban farm families, projected ‘agricultural populations’ is the specific FAO parameter of relevance to our work. These are people directly dependent on agriculture and the numbers tend to be higher than the rural population. Applying the HPI to FAO population projections to 2010 and 2020 results in Table 3.

Table 3. Projected agricultural poor population (millions of people) by region by 2000, 2010 and 2020

Region	ICRAF region	No. of people (million)		
		2000	2010	2020
Latin America total	Tropical Latin America	26.7	23.8	20.8
South and East Asia total	South East Asia	566.2	578.4	568.0
Sub-Saharan Africa	East Africa	75.6	90.2	104.7
	Humid West Africa	53.7	58.6	62.4
	Sahel	26.6	33.4	40.8
	Southern Africa	37.1	42.2	47.9
Sub-Saharan Africa total		193.0	224.4	255.8
Grand total		785.9	826.6	844.7

These figures agree well with projections produced by the World Bank, using an income level indicator of poverty (less than US\$1 per day per capita).

Numbers of agricultural poor reached and numbers of adopters

To address the question of what numbers of agricultural poor will ICRAF innovations (including policy changes brought about by ICRAF research activities) have reached by 2010 and 2020, a two-step method was used. First we estimate the numbers of agricultural poor that can be reached (have access to germplasm and knowledge), and then the proportion of those reached that become regular adopters.

Reached: The numbers of agricultural poor who should be reached by ICRAF innovations are estimated as follows. Countries are broken down into those where ICRAF has a direct influence (i.e. senior staff within existing ICRAF regions currently posted, or expected in the next few years), those in which it has indirect influence (i.e. close links with partners but no senior staff) and the rest of the developing world. The percentage of the agricultural population that might be 'reached' by 2010 and 2020 in each of these categories of country was estimated by expert opinion.

Table 4. Agricultural poor populations that can be reached by ICRAF by 2010 and 2020

Region	ICRAF region	No of people reached (million)	
		by 2010	by 2020
Latin America	Tropical Latin America	3	5
South and East Asia	Southeast Asia	21	58
	South Asia	3	10
Sub-Saharan Africa	East/Central Africa	27	50
	Humid West Africa	5	11
	Sahel	11	22
	Southern Africa	13	23
Sub-Saharan Africa total		56	106
Grand total		83	179

In aggregate, therefore, ICRAF can reach around 80 million agricultural poor by 2010 and nearly 180 million agricultural poor by 2020. 'Reached' refers to individuals who have the necessary knowledge of agroforestry innovations to implement them, and who have access to the necessary germplasm to adopt. In other words, individuals 'reached' are those who as a result of agroforestry innovations have more options for improved livelihoods.

Adopters: The proportion of actual adopters are estimated on the basis of actual case studies of populations of adopters and of expert opinion, as between 20 and 30% of farmers reached. Thus, ICRAF innovations should be adopted by around 15 to 20 million of agricultural poor by 2010 and 30 to 50 million of agricultural poor by 2020. The 20–30% adoption rate is what has happened with traditional approaches. One of the challenges of ICRAF's Development Division is to raise the proportion of adopters to 40–50%. We do not make such predictions at this time, but the research on the adoption process of our NRM approach included in this strategy is aimed at tackling this issue.