

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

SCIENCE COUNCIL AND CGIAR SECRETARIAT

Evaluation and Impact Assessment of the Alternatives to Slash and Burn Program

REPORT OF THE EXTERNAL REVIEW
OF THE SYSTEMWIDE PROGRAM
ON ALTERNATIVES TO SLASH AND BURN (ASB)

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SCIENCE COUNCIL SECRETARIAT

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Summary and Recommendations

Summary Findings

Introduction

The CGIAR Systemwide Program on Alternatives to Slash and Burn (ASB) was born out of recommendations agreed at the 1992 Rio Earth Summit. It has operated as a CGIAR Program since 1994. The Program has an ecoregional focus on the forest-agriculture margin in the humid tropics, with benchmark sites in the Amazon of Brazil and Peru, the Congo Basin forest of Cameroon, the island of Sumatra in Indonesia, the northern mountains of Thailand, and the island of Mindanao in the Philippines. Its current goal is to “raise productivity and income of rural households in the humid tropics without increasing deforestation or undermining essential environmental services.” It approaches this goal through a strategy of integrated natural resource management (iNRM), emphasizing long-term engagement of researchers with farmers, local communities and policymakers at various levels.

Today, ASB consists of a partnership of over 80 institutions from around the world, including research institutes, NGOs, universities, community organizations, farmers’ groups, and other local, national, and international partners. Its governance is provided by a Global Steering Group (GSG) comprising 6 NARs and 5 IARCs. The governing body was chaired by ICRAF for most of ASB’s history, but since 2004 has been chaired by CIFOR. The convening Center is ICRAF. Coordination is provided by a global coordination office, 3 regional facilitators, and 6 national facilitators provided by partner institutions. The ASB network of partnerships encompasses a complex array of project activities. These have been supported by grants totaling US\$ 64.5M (constant 2004 US\$) over the period 1994-2004.

This Review was commissioned in 2004 by CGIAR’s Science Council as an Evaluation and Impact Assessment of ASB. The Review was carried out between late 2004 and mid-2005 by a three member Panel. Members of the Panel visited ASB field sites in Indonesia, Cameroon, and Brazil, as well as the ASB Global Coordination Office in Nairobi. One Panel member attended the December 2004 meeting of the ASB Global Steering Group in Bogor. The Panel also benefited from discussions with a group of ASB regional leaders assembled in Nairobi by the Global Coordination Office in June 2005. A number of other relevant experts from inside and outside the CGIAR System were interviewed by Panel members.

The summary findings and recommendations of this Review are presented in this Chapter. The body of the Review, backed by a number of Appendices, provides the detailed evidence and discussion supporting this summary. An intermediate level of detail is provided by the final “Summary of Findings” section located at the end of each Chapter.

What have been the impacts of ASB?

The Panel concludes that the ASB Program has played a significant role in transforming the way that decision makers think about the factors shaping land use at forest-agriculture interfaces in the humid

tropics. In so doing, it has created the world's pre-eminent system for use-driven, comparative scientific investigation of human-environment interactions at the forest margin across the pan tropic domain.

The uptake of ASB products by independent publishers and by users of the Program's world wide website is substantial and, suitably normalized, on a par with or somewhat greater than levels achieved by other CGIAR units. There exists an excess demand for Program leaders to serve as speakers and as participants in high level international committees. The Program itself embodies a capacity for research and development that is making it an increasingly attractive partner for other institutions. ASB's own training programs are taken up by relatively fewer trainees than seems to be the case for several other CGIAR Programs, but its Lecture Notes are in high demand by outside institutions and individuals.

ASB results are treated as influential outputs by communities specializing in the ASB domain around the world. Particular recognition has been given to its research results in pantropical research methods, soil science, the analysis of benefit trade-offs among alternative land uses, and cross-sectoral policy guidance. In the action realm, ASB is widely acknowledged to have contributed directly to the design of innovative policies, legislation and institutions across its pan-tropic domain. On capacity building, the Panel concludes that a substantial and significant outcome of ASB's activities over the last decade has been the creation of an important and at least partially replicable capacity for harnessing research to the task of advancing sustainable development in the ASB domain. This positive assessment notwithstanding, the Panel notes that while ASB is known to exist by some people in working in broader fields of development and conservation, its outputs are not widely cited or utilized there as they could and should be as truly global public goods. This shortfall is likely to be remedied in part by the release this year of several excellent synthesis outputs. It also presents excellent opportunities for high returns on future dissemination investments. The same is true for the kind of capacity that ASB has shown it can produce, which remains drastically undersupplied across the pan-tropical domain.

As noted above, the ASB Program has played a significant role in transforming the way that decision makers think about the factors shaping land use at forest-agriculture interfaces in the humid tropics. It has also helped to change the agendas of researchers, policy analysts and entrepreneurs seeking ways to raise productivity and income of rural households without increasing deforestation or undermining essential environmental services. In so doing, ASB has created the world's pre-eminent system for use-driven, comparative scientific investigation of human-environment interactions at the forest margin across the pan tropic domain. Despite relative weaknesses in certain areas of modeling and institutional analysis, the Program has set the standard and established a model for integrating natural and social science approaches in response to complex NRM problems. In both international policy circles and at the benchmark sites across the tropics where ASB has had the resources to bring knowledge into action, the Program has begun to bring about lasting changes in how resources are allocated and how resource users conduct the use of complex landscapes. The Program's greatest shortcoming is that it has been unable to secure or mobilize the resources to extend its results to any but a small fraction of the 1.2 billion across forest margins of the tropics people who are still struggling to mitigate their poverty while conserving the natural resources on which their and others' well being depends.

How effective and efficient has ASB been in performing its core functions?

The Panel concludes that ASB has worked effectively and efficiently in pursuit of its core mission to “raise productivity and income of rural households in the humid tropics without increasing deforestation or undermining essential environmental services.

The mechanisms employed by ASB in its reflexive approach to goal and strategy (re)definition have been both efficient and equitable. As effectively as any organization known to the Panel, ASB has used systematic reflection on its own research and experience not only to learn better answers to its original questions, but also to learn better questions to ask. In so doing, the Program has become a progressive driving force for articulating the more complex, realistic and integrated view of human-environment interactions at the tropical forest margins.

While ASB as a Program has been effective in raising an increasing level of financial resources to support its work, these resources have been both inadequate in total amount and imbalanced in allocation across tasks to enable the Program to realize its full potential. On the human resource side, the ASB consortium has gathered a team of excellent scientists at all levels, well mixed with regard to discipline, gender and geographic origin. Sustaining this social capital in a maturing Program will be a continuing challenge.

ASB has employed iNRM approaches to produce research-based knowledge relevant to its core mission in highly innovative, effective and efficient ways. Its problem-driven approach, anchored in the needs assessments noted above, has assured the relevance of its activities. The Panel finds that both the total quantity and the mix of the output products produced by ASB are generally appropriate for the evolving character of the ASB Program. Regrettably, ASB does not systematically track its outputs related to new technologies and policy reforms, almost certainly contributing to the relatively low impacts of those products that we documented earlier.

How well has ASB been managed and governed?

The Panel concludes that the ASB has developed a governance and management structure that has been generally effective and efficient in promoting innovative research that successfully integrates capabilities and concerns across CGIAR Centers, tropical regions, scales and disciplines.

The ASB is governed and managed through a Global Steering Group that serves as a policy and decision making body, and a Global Coordination Office that functions in an executive capacity. The Panel finds that both groups have recruited highly respected and effective individuals. Lines of authority and responsibility are clear, interactions between the two groups are mutually supportive with innovative ideas and suggestions for improvement flowing in both directions.

Despite its many strengths, however, the Panel finds that ASB’s governance and management structures have not been as successful as would be desirable in developing mechanisms to assure that strategies for achieving ultimate Program impacts on the world of action are in place and are regularly revised in light of experience. And the Program has not

dealt adequately with the governance and management challenge of securing multi-Center ownership and shared responsibility for its support.

What is the relevance of ASB to the CGIAR, and what are its possible futures?

The Panel concludes that the ASB Systemwide Program has been highly relevant to the CGIAR's core mission and is pursuing work well aligned with the Science Council's recently articulated System Research Priorities for 2005-2015. The capacity created by ASB can make a unique contribution to achieving CGIAR and SC emerging goals on integrated land, water and forest management at landscape level. That capacity should be sustained and strengthened.

The Review Panel finds that the ASB Systemwide Program has transcended the limiting scope of its initial framing to focus not on "alternatives to slash and burn" but rather on *"factors shaping land use at forest-agriculture interfaces in the humid tropics."* Within this domain ASB has evolved a goal to "raise productivity and income of rural households without increasing deforestation or undermining essential environmental services."

The Panel finds that these emergent goals of the ASB Program are not only important in themselves, but are also well aligned with CGIAR's historical mission to "achieve sustainable food security and reduce poverty in developing countries through scientific research and research-related activities, ... increasing income and improving livelihoods, without harming the environment" (CGIAR Secretariat, 2004, p. 3). The Program goals also fit squarely within the research priorities recently announced by the CGIAR Science Council, notably Priority 4a on Integrated land, water and forest management at landscape level, which seeks to promote "improved land use practices (that) contribute to increased and sustained productivity, optimal conservation, reduced conflicts and equitable use of land, water and forest resources in multi-use landscapes" (CGIAR SC, 2005, p. 57).

Against this background of congruent goals, the Panel identified three options for the future of ASB: i) declare victory, completing the current synthesis activities and draw the Program as a free standing entity to a successful close over a relatively short period of time. Key ongoing themes would be handed off to appropriately enthusiastic Centers that would then specialize on them; ii) continue to evolve as it has in the past, integrating as appropriate the recommendations produced by this review; or iii) engage development more directly, establishing substantially tighter collaborations between its research activities on the one hand and organizations and initiatives engaged in implementing and scaling up development action on the other.

The Panel finds that a strong case has been made for rejecting option (1) declare victory and close. Given the uncertainties (at least to the Panel) over how the SC's new science priorities will evolve and where the "Challenge Programs" are headed, the Panel does believe that it has sufficient information to make a clear case in favor of either options (2) or (3). An informed choice on ASB's future will require more clarity about objectives, priorities, and modalities in the environment in which it operates. The process of making that choice would also benefit from an open discussion involving not only existing ASB partners, but also other groups pushing research, conservation and development agendas on the tropical forest margin.

Recommendations

Recommendations to strengthen impacts-based strategic planning

Recommendation A: ASB should extend its strategic planning process to include explicit identification of what knowledge outcomes and impacts it most wants to achieve with which audiences, and should target its activities and resources accordingly. In particular, it should give more careful attention that it has in the past to reaching the broader community of scholars and policy analysts beyond that of its immediate CGIAR/NARS and related clienteles. It should develop metrics of the outcomes and impacts actually achieved, and regularly compare these with its objectives.

Recommendation B: ASB should extend its strategic planning process to include explicit identification of further opportunities in themes, regions and global institutions where action R&D (policies, technologies, practices) is likely to create the greatest impact. The Program should also link policy research results to elements of governance environments that are key in shaping results on the ground. It should develop metrics of the outcomes and impacts actually achieved, and regularly compare these with its objectives.

Recommendation C: ASB should extend its strategic planning process to include explicit prioritization of capacity building goals and intended impacts. In particular, the medium-term (3-5 years) planning mechanism for the capacity building agenda should be further clarified and strengthened in ways that reflect needs of partners at the local and national levels. As demand will almost certainly outstrip supply, this will require a more systematic, Program-wide assessment of relative strengths and weaknesses in capacities of ASB partner institutions. The Program should develop metrics of the outcomes and impacts actually achieved, and regularly compare these with its objectives.

Recommendations to strengthen implementation, management and governance

Recommendation D: ASB should continue to strengthen its recent efforts to set collective priorities for expenditure of GCO effort in fundraising activities, including setting an appropriate level of GCO support for national and regional fundraising.

Recommendation E: ASB should strengthen collective priority setting for the expenditure of GCO and regional/national coordinator effort in communicating key ASB findings to key decision- and policy makers.

Recommendation F: The CGIAR System should help to assure a sustained investment in key coordinating staff that makes the ASB a true SWP. This applies to staff positions in both the Global Coordinating Office and coordinator positions at the regional/national level. Without that staff, the system will not be able to benefit from the capacity that ASB has built over the last decade that now positions it to contribute centrally to emerging SC goals. The social capital built up in ASB's coordinator positions over the last decade is now at risk or is actively eroding due to trends in donor support that the ASB Program, acting alone, is unlikely to be able to reverse.

Recommendation G: The CGIAR System should take steps to improve the incentives for collaboration among Centers and programs in activities central to achieving systemwide goals, including joint funding proposals. Without an improvement in such incentives SWPs such as ASB are unlikely to be viable in the long term. In taking this step, CGIAR should join other R&D based organizations in recognizing not only the value but also the special vulnerability of the innovation- nurturing “safe spaces” that SWPs such as ASB provide to a variety of IARCs, NARs and other partners that would otherwise be much less likely to engage in original and productive collaborations.

Recommendation H: ASB should continue the effort to formalize its governance structures that has recently resulted in the publication of a formal “Governance Policy” document. In so doing, it should pay special attention to how the admirably collegial procedures of its Global Steering Group (GSG) can be monitored and if necessary adjusted to assure that decision making is open to input from GSG new members, and from stakeholders in the ASB domain not formally represented on the GSG.

Recommendation I: ASB and its host Center ICRAF should give strong consideration to creating some form of independent ASB advisory group to assist the program in its realizing its existing commitment to self-reflection and learning. The group should provide a venue to representative scholars and practitioners not directly associated with ASB to be periodically updated on the Program’s work, and to periodically offer input on how ASB is or is not connecting with relevant developments outside of the CGIAR. The existing GSG is (appropriately) too inward looking and narrow in composition to play this role. An ad-hoc decadal review by a Panel such as ours is simply too infrequent to be of much help. Some such advisory group could be complemented by a less frequent use of internally commissioned “external reviews” that have been under discussed elsewhere in the CGIAR.

Recommendations on the Future:

Recommendation J: The CGIAR should sustain and strengthen the global and systemwide capacity created by ASB to make a unique contribution to CGIAR and SC goals on integrated land, water and forest management at landscape level. Of the options for implementing this recommendation reviewed by the Panel, that of closing down ASB and devolving its key tasks to existing Centers is not likely to be successful. A stronger case can be made for either of two other options: continue to evolve as it has in the past, integrating as appropriate the recommendations produced by this review; or engage development more directly, establishing substantially tighter collaborations between its research activities on the one hand and organizations and initiatives engaged in implementing and scaling up development action on the other (e.g. the Challenge Programs). Given current uncertainties over how the SC’s new science priorities will evolve and where the “Challenge Programs” are headed, the Panel does not believe that it has sufficient information to make a clear recommendation in favor of either of these latter options. It does, however, recommend that the process of making the choice about ASB futures should entail an open discussion involving not only existing ASB partners and CGIAR Centers, but also other groups promoting research, conservation and development agendas on the tropical forest margin.

Recommendation K: Any future evolution of the ASB Program should shed the “alternatives to slash and burn” label in favor of one more consistent with the Program’s actual scope and important contributions.

Recommendation for improving assessment:

Recommendation L: The Panel commends to the CGIAR the “Results based management” (RBM) framework adopted for this Review as one with significant potential for evaluating and assessing programs in natural resource management. That said, the framework would be more useful to program managers used ex-ante rather than only ex-post. The greatest difficulty in using the RBM framework has been in addressing the question “compared to what”. For CGIAR programs, the best point of comparison is other CGIAR programs, but the Panel was frequently frustrated in its work by the lack of data from those programs that could be used in calibrating the evidence we assembled on ASB. The Panel, therefore, recommends that the CGIAR develop and publicize standard comparative metrics and data for use in future RBM assessments of particular programs.

1 INTRODUCTION

In this Chapter, we provide an introduction to the present Review (para. 1.1), a sketch of the ASB Program, (para. 1.2), and a summary of prior reviews that have been conducted of the Program (para. 1.3). The majority of the Chapter is devoted to a discussion of what the Review Panel found to be the central challenges of conducting meaningful evaluations and impact assessments of Natural Resource Management programs, and of how we attempted to meet those challenges in the present study (para. 1.4).

1.1 The Work of this Panel and its Report

This document constitutes an Evaluation and Impact Assessment of the Alternatives to Slash and Burn (ASB) Systemwide Program (SWP), an inter-Center initiative of the Consultative Group on International Agriculture Research (CGIAR) led by the World Agroforestry Center, previously ICRAF. It was commissioned by the Science Council of CGIAR in pursuit of the Council's mandate to ensure the relevance and quality of science within the CGIAR. The composition of the three-member Panel that conducted the Evaluation and Impact Assessment (henceforth, "the Review") is given in Appendix I. The Terms of Reference for the Review are reproduced in Appendix II., together with an annotation indicating which Section of the Review addresses each of the Terms of Reference.

The Review was carried out between late 2004 and mid-2005. We began with a review of prior assessments and evaluations touching on the ASB Program (see below). Members of the Panel then visited ASB field sites in Indonesia, Cameroon, and Brazil, as well as the ASB Global Coordination Office in Nairobi. One Panel member attended the December 2004 meeting of the ASB Global Steering Group in Bogor. The Panel also benefited from discussions with a group of ASB regional leaders assembled in Nairobi by the Global Coordination Office in June 2005. A number of other relevant experts from inside and outside the CGIAR System were interviewed by Panel Members. The Panel was given access to the results of an extended on-line dialogue conducted among ASB participants on the subject of ASB management and organization.¹ A summary of the Panel's visits and a list of individuals consulted for this Review are given in Appendix III.

In addition to its interviews, the Panel has made use of a variety of documentary evidence, and conducted a substantial amount of original data assembly and analysis. As background to this work, we relied on an extraordinary effort to assemble relevant materials and data by the ASB's Global Coordination Office. The "Review files" resulting from our requests for information were posted to a shared web site hosted by the Panel Chair and accessible to Panel members, the Science Council Secretariat, and the ASB Global Coordinating Office.² The Table of Contents for the Review Files is provided in Appendix IV.

The Review is organized as follows. The remainder of this Chapter summarizes the history of the ASB SWP and prior reviews of the Program, and then describes the strategy of this evaluation and impact assessment. Following the approach outlined in that strategy, we begin in Chapter 2 with an assessment of the impacts of ASB on the world external to the Program itself. Chapter 3 then evaluates the internal organization and management of ASB

Program, and how effectively and efficiently they have contributed to its external impacts. Chapter 4 continues the evaluation with an examination of ASB governance. Finally, in Chapter 5 we conclude the Review with our findings on the relevance of ASB to the CGIAR's core mission, and a discussion of its possible futures.

1.2 The ASB Program

ASB was born out of recommendations agreed at the 1992 Rio Earth Summit (Agenda 21 Chapter 11 on Combating Deforestation) and has operated as a CGIAR Systemwide Program since 1994. The Program has an ecoregional focus on the forest-agriculture margin in the humid tropics, with benchmark sites in the Amazon of Brazil and Peru, the Congo Basin forest of Cameroon, the island of Sumatra in Indonesia, the northern mountains of Thailand, and the island of Mindanao in the Philippines. Its current goal is to "raise productivity and income of rural households in the humid tropics without increasing deforestation or undermining essential environmental services." It approaches this goal through a strategy of integrated natural resource management (iNRM), emphasizing long-term engagement of researchers with local communities and policymakers at various levels.

Today, ASB consists of a partnership of over 80 institutions from around the world, including research institutes, NGOs, universities, community organizations, farmers' groups, and other local, national, and international partners. Its governance is provided by a Global Steering Group (GSG) comprising 6 NARs (Brazil, Cameroon, Indonesia, Peru, the Philippines, Thailand) and 5 IARCs (CIAT/TSBF, CIFOR, ICRAF, IFPRI, IITA). The governing body was chaired by ICRAF for most of ASB's history, but since 2004 has been chaired by CIFOR. The convening Center is ICRAF. Coordination is provided by a global coordination office, 3 regional facilitators, and 6 national facilitators provided by partner institutions. The ASB network of partnerships encompasses a complex array of project activities. These have been supported by grants totaling US\$ 64.5M (constant 2004 US\$) over the period 1994-2004. Overall, about 20% of this support has been used for global activities while 80% has gone to partners.

1.3 Prior reviews of ASB

The ASB Program was reviewed frequently in its early years. More recently, its only reviews have taken place within the context of larger CGIAR reviews in which ASB was treated as a component. Early in its work, the Panel considered the findings and recommendations of Fuglie and Ruttan's insightful study of the "Value of external reviews of research at the International Agricultural Research Centers," particularly the pitfalls it identified in review practice.³ From that perspective, we studied and attempted to learn from the following previous reviews and findings on ASB:

- 1995. Phase I (Eswaran) Review. Requested by GEF as a basis for granting approval and further funding. Dr. Hari Eswaran, World Soil Resources was appointed the evaluator. His report endorsed the outcome of Phase I and recommended funding for a second phase of five years.
- 1997. Phase I (UNEP) Review. UNEP, Scientific and Technical Advisory Panel (STAP) conducted an additional review of ASB Phase I. Reviewers recognized the importance of both the aims and outputs of the Program.

- 1998. Phase II (Solbrig) Review. Evaluation of Phase II requested by UNDP. Dr. Otto T. Solbrig, Bussey Professor of Biology, Harvard University was selected to carry out the Phase II evaluation. His review was quite critical, but focused almost exclusively on the issues of replicability of field methods. Review critiqued by TAC as partially non-responsive to the terms of reference. The present Panel used this report as a warning of the dangers, identified by Ruttan et al. in their "Review of CGIAR reviews," of second guessing the peer review findings of individual Program products.
- 2000. CGIAR conducts First Review of "Systemwide Programs with an Ecoregional Approach" (Henzell Review): Report singles out ASB as leading these CGIAR Programs in many ways, concluding that "The Alternatives to slash-and-burn Program has gone further than the others in relating its research sites to the whole area over which the problem occurs, and in scaling up to the global level in its findings on trade-offs...".
- 2003. World Bank report *CGIAR at 31: A Meta-Evaluation of the Consultative Group on International Agricultural Research* heralded ASB as a prototype of successful application of Integrated Natural Resource Management (iNRM) methodology. It found that "ASB has been applauded..... for innovative field research, strong science, and for going furthest within the CGIAR toward implementing effectively a holistic, ecoregional approach founded on in-depth local research linked methodologically across long-term benchmark sites around the world to permit effective scaling up to global level. The intellectual value of this work has derived from the synthesis afforded by careful methodological coordination across sites on different continents, and close working relationships with ARIs and NARS."⁴

The Panel benefited from the insights of these prior reviews. We appreciated the constraints imposed on them by either early timing (before many results were available), or limited resources, or broader missions. Nonetheless, we were somewhat frustrated by the lack of quantitative data and independent fact-finding reported in the reviews, and by some tendency of the later ones to cite the earlier ones as their primary sources of evidence. We understood that the charge to the present review was to assemble a more systematic and independent evaluation and assessment of the ASB Program's performance.

1.4 Strategy for this Evaluation and Impact Assessment

This Review seeks to carry out an evaluation and impact assessment of the ASB from the time of its inception until the middle of 2005, essentially a decade. In particular, the Review addresses:

- the *relevance* of ASB to CGIAR's overall goals (Terms of Reference or TOR #1);
- the *impact* of ASB activities on efforts to attain those goals (both directly through its own activities and indirectly through the value it has added to the activities of others) (TOR #2,3);
- the *effectiveness and efficiency* with which ASB's organizational arrangements, procedures and governance structures have contributed to its impacts (TOR # 4-6); and
- the *future* of ASB (TOR #7).

To achieve its goals, the Review has attempted to develop an approach to impact assessment and evaluation that is appropriate for the ASB SWP, could be implemented within the constraints of time and financial resources dictated by the SC, and would be of sufficient

generality that it might be applicable to similar Programs of the CGIAR. This led us to adopt as our general framework for evaluation that established within the CGIAR for all natural resource management (NRM) Programs. We combined this NRM framework with a modified version of CIDA's Results Based Management (RBM) framework to create an integrated approach for the impact assessment and evaluation of ASB. Given the lack of generally accepted methods and criteria in this area, we discuss our strategy in some detail in the following two sections.

Criteria for reviewing Integrated Natural Resource Management (iNRM) Programs

ASB is one of several experiments that the CGIAR has undertaken in the domain of *integrated natural resource management* (iNRM). ASB has endorsed the overall objective for all CGIAR/iNRM programs of "incorporating multiple aspects of natural resource use into a system of sustainable management to meet explicit production goals of farmers and other uses, as well as goals of the wider community" (Task Force on iNRM, 2000). It has also embraced the overall CGIAR/iNRM *strategy* of conducting problem-driven work, grounded in participatory assessment of users needs.

Given the centrality of iNRM work to ASB, this Review, therefore, adopted the general guidance provided by the TAC (2001) study "NRM Research in the CGIAR: A framework for Program design and evaluation." In addition, we found to be particularly helpful the extension of the TAC study provided by Barrett (2003) in his excellent meta-evaluation of NRM research at the CGIAR. During the final stages of our Review, a draft of the new strategic planning document of the SC (2005) became available and was used to inform and focus our final conclusions. Among the points emerging from these two works that have been particularly influential in shaping our Review of the ASB program are that iNRM programs in the CGIAR should seek to:

- focus on those aspects of iNRM research that are directly supportive of CGIAR's core competencies in agriculture, rather than drifting into valuable NRM research that is nonetheless tangential to agriculture (Barrett, 2003: Para. 84) and, within this domain, to concentrate in niche areas where CGIAR programs have a comparative advantage relative to other international scientific institutions involved in the production of global public goods, with special attention to "areas where ARI (advanced research institutes) and NARES research has historically been deficient, as on questions of tropical deforestation" (Barrett, 2003: Para 90);
- generate the global public goods (GPGs) that are the ultimate justification of investments in multi-national research efforts, especially creating *and making publicly available* knowledge regarding; a) generalizable process studies, models and "theories of natural resource systems' interrelationship with human activity"; b) methodological innovations in "ecological monitoring, environmental impact assessment and ... policy analysis related to NRM"; c) policy research on "what works, when, where and why, especially of generalizable interventions, policies, practices or technologies"; and d) data that can be used by others "to replicate important empirical results, undertake original empirical research, perhaps especially synthesis work" (Barrett, 2003: Para. 11);
- build capacity that focuses not only at the individual level, but also "at the institutional level within national agricultural research and extension services (NARES) that can be directly linked to CGIAR NRM research" (Barrett, 2003: Para. 88); and

- address the need for cross-scale and interdisciplinary research in NRM by moving beyond the classic CGIAR model of research fully internalized within the System to explore models involving “collaborative research with other institutions or facilitation of research networks outside the System” (Barrett, 2003: paras 13, 91).

We use these desiderata of “good CGIAR/iNRM” Programs throughout this Review.

Results Based Management (RBM) approaches for iNRM reviews

CGIAR has long recognized the absence of generally accepted methodologies assessing the impact of iNRM programs (e.g. TAC Standing Panel on Impact Assessment. 2000. Impact Assessment Workshop. Rome, May 2000). As Barrett (2003, Para 75) notes, “Impact assessment is far more complicated than simply establishing whether research goals have been met and whether the resulting science is of high quality. The complications arise not only because of the lags involved between scientific discovery and the manifestation of the value to society of those discoveries, but also because of problems of attribution when so many different entities contribute to the scientific, market, institutional and regulatory environment in which human behavior ultimately takes places.”

As part of his long-standing program of research on evaluation and impact assessment methods, the Chair of the present Panel had collaborated with ASB before his appointment to this Review in exploring appropriate methods for grappling with these difficulties in designing its own programs (Liu, 2004; Thaker, 2005). Drawing from that work and its own experience, the Panel adopted for this Review the “Results Based Management” (RBM) framework originally developed by the Canadian International Development Agency.⁵ The RBM framework recognizes the difficulties of attributing ultimate impacts to particular programs by focusing instead on the broader category of “results.” RBM defines a “result” as “a describable or measurable change resulting from a cause-and-effect relationship.” It then characterizes programs in terms of a *chain* of results leading from initial problem formulation through research to ultimate impact. Based on the Panel’s prior experience and its preliminary analysis of the ASB program, we adopted for this Review a modified RBM-based framework developed for ASB by Liu (2004). This framework is summarized in Figure 1 and described below.

Sequences of results: We extended the original RBM framework to include the sequence of causally linked results summarized in Table 1-A.⁶ We refer to these results as a “sequence” rather than using the “chain” image adopted in the original RBM framework because our preliminary review of ASB suggested the iterative character of causal linkages in its work. Most particularly, as suggested by the circular form of Figure 1, we wish to capture the feedback of impacts (or lack thereof) on strategic goal- and priority-setting. More generally, we want to emphasize the possibility of adaptive feedback at each step along the causal sequence.

RBM, evaluation, and impacts: The conventional separation between impact assessment and evaluation has been an awkward one to bridge in many reviews. We found the RBM framework, as modified above, to offer a useful means of integrating these two tasks and perspectives. When speaking of impact assessment, we focus in this Review on the results of ASB that take place “outside” the boundaries of the ASB Program and beyond its immediate

control.⁷ Our “assessment” thus includes the “top” part of Figure 1, and the latter three results in the sequence reproduced immediately above (i.e. uptake, outcomes and [ultimate] impact). This “outside” perspective on assessment is an important means of implementing the CGIAR view that research findings and innovations results do not become a global public good until they are taken up by the broader global community (see Barrett, 2003).

When speaking of evaluation, we focus on the sequences of results that take place “inside” ASB and that thus can in principle be directly manipulated by Program management. Our “evaluation” thus includes the “bottom” part of Figure 1 and the first four results in the sequence reproduced immediately above (i.e. priority setting, inputs, activities, and outputs).

We realize that this depiction of the complex relationships between impact assessment and evaluation is oversimplified. We have nonetheless found it a productive and logical way to organize our Review. In particular, we begin in Chapter 2 with our assessment question: “What have been the ultimate impacts of ASB on the world outside the Program?” We then turn in Chapter 3 to the evaluation question of “How effective and efficient has ASB been in performing the core functions that are intended to result in its impacts?”

Scales of results: We introduced a further modification to the RBM framework to reflect the complication that ASB (like many other iNRM Programs) is an emphatically multi-scale effort, seeking to promote change on the ground even as it produces the global public goods central to its mission. In order to capture this multi-scale character of the Program, this Review considered results across the three spatial scales on which ASB operates: global (associated with Program activities at the system-wide level), regional (associated with the Program’s regional and national efforts), and local (associated with the Program’s individual benchmark sites). We attempted to consider both results restricted to a single scale, and results emerging from cross-scale interactions. In keeping with the global public goods goals of the CGIAR, however, we focused our Review on results at the global and to a lesser extent regional level.

Categories of results: We used the modified RBM framework to review three broad categories of results to which ASB seeks to contribute. We define:

- knowledge results range from basic understanding of human driving forces of land use at the forest-agriculture margin, to creation of new methods and data sets important for understanding those sources;
- action results include innovations in technologies and practices, policies, and institutions;
- capacity results encompass human resources, finance, physical facilities, and institutional structures that give the world the ability to produce ongoing results relevant to the ASB domain.

We note that these categories are not altogether separable. Research output is disseminated to potential users through publications, seminars and technical debates. This is aimed at having an impact on people’s knowledge – how they think about resource management at the margins. But some of the direct consumers of such knowledge are decision makers and policy advisors. So research can directly influence action as well. Second, research may directly induce technological changes on the ground not only by developing new devices but also by promoting farmers’ adoption of new technologies, or new practices of combining

physical inputs to generate desirable products. Third, research may contribute to the adoption of government policy reforms that change the incentive environment and thus shape the actions of producers and consumers in directions that are desirable from society's standpoint. Finally, both research and direct action may increase the capacity of the system to produce more and better results in the future. The Panel has attempted to keep these backwards and forwards linkages in mind, even as it uses the categories introduced above to structure its review.

The dilemma of attributing causality

For each category and scale of result, our review has attempted to follow the RBM approach in developing a multi-link causal sequence of intermediate results connecting initial program priorities and inputs through intermediate activities and outputs, to uptake, outcomes and ultimate impacts.

There are two difficulties with this (or any other) approach to attribute causation of changes in high order ideas or actions to particular discoveries or interventions. The first is the problem of multiple causation. The RBM framework acknowledges that the degree to which results can be confidently attributed to program-specific inputs and actions decreases as one moves "along" the sequence from inputs toward ultimate impacts on the state of the world. (We would add that it also decreases as one moves from local to global scales of operation.) This is because ASB is only one of many "actors" and influences affecting issues of development and/or conservation in the forest and/or agricultural systems of the humid tropics. Changes observed in those systems since the ASB's inception may, therefore, be due to ASB activities, to independent activities and influences, or to interactions between the activities of ASB and others. An evaluation of ASB's role, relevance and impacts would ideally be assessed against a background of the research, action, and policy that would have taken place in its absence. That "no-ASB" case is, of course, ultimately unknowable, though could perhaps be approximated through comparison with regions where ASB has not played an active role.

The RBM framework makes a first stab at the attribution problem simply by disaggregating causes and effects into the chain or sequence described above. At each step along the sequence, there exists the potential for additional external contributions to the results at the next step. By insisting on clarity about measurable attributes of results at each successive stage, a review can at least aspire to a reasonable balance between confidence in attributions (highest at the early stages of the sequence), and relevance of results (highest at the later stages of the sequence). To complement this general property of the RBM approach, the Panel took the additional step of determining the most significant changes that have been observed in the ASB domain (land use at the agro-forest interface in the humid tropics) over the last decade, with no regard to whether ASB has played a role in causing those changes (see Chapter 2: Impacts/ historical context). We then asked whether significant correlations exist between those observed patterns or change and the patterns that might reasonably have occurred if the ASB results we have documented had exerted a dominant influence on them. Finally, in the conclusions to our assessment, we attempt the more difficult and uncertain task of evaluating the extent to which such correlations can be said to reflect causal impacts of ASB.

A second and related problem concerns how a Review can achieve an independent view of major changes in a domain such as that occupied by ASB. The easiest way for a Review Panel to shape a perspective on major changes in a field is through the eyes of the program it is reviewing. The logical fallacy of taking this course is clear, but this does not stop many reviews from letting the program they are reviewing implicitly define the major changes against which it will be assessed. (This does not imply impropriety on the part of either the reviewers or the reviewed program. It does imply that time-limited reviewers and reviewees often take the easy way out and focus on what the program knows best – i.e. its own accomplishments.)

To mitigate the potential distortions of letting the ASB program and review define themselves entirely from the perspective of the program's activities, this Panel adopted what we call the "Gold Standard" approach. This amounted to identifying a limited series of recent and relevant documents that are viewed by expert scholars and policy analysts to represent authoritative perspectives on ASB's domain, but that were NOT assembled or edited by ASB authors.⁸ Based on our conversations with the independent experts noted above (see also Annex III), we selected the "Gold Standard" references listed in Table 1-B. We then used these "Gold Standard" documents in three ways. First, they became our source of information for our documentation of "Historical changes" in ASB's domain as referred to above and characterized in depth in Chapter 2 (Impacts/Historical context). Second, to the extent that the "Gold Standard" documents cite or otherwise refer to results of the ASB Program, they became one important piece of independent evidence (i.e. evidence not selected for our review by the Program) of uptake and outcomes that are results of ASB efforts. We present this analysis in Chapter 2 (Uptake and Outcomes). Finally, where the "Gold Standard" documents themselves represent significant "impacts" (e.g. the World Bank's strategy and operations documents for shaping lending related to forestry), we examine the extent to which they pay particular attention to whether the authors of those documents attribute their content to the influence of ASB.

The Panel is aware of many shortcomings of the "Gold Standard" approach. Foremost among these is that others may well have picked different "standards." At a minimum, however, our explicit selection of a set of reference cases specifies at least one non-self referential standard against which to measure ASB's achievements, and provides the opportunity for others to suggest explicit changes in those standards. We also guard against over reliance on the "standards" by considering a variety of other, more conventional sets of evidence in conducting our Review. All in all, however, we believe that the "Gold Standard" approach has served us well, and might well be emulated by other reviewers.

2 WHAT HAVE BEEN THE IMPACTS OF ASB?

In this chapter the Panel assesses the impacts of ASB on the outside world, prior to turning in Chapter 3 to its evaluation of how effectively and efficiently the Program's internal management has contributed to those impacts.⁹ In the terms of Table and Figure 1, this chapter assesses the *uptake* of ASB results by the outside world, the most significant external *outcomes* following from that uptake, and the ultimate *impacts* of those outcomes on the world.¹⁰

The chapter is organized as follows. Chapter 2.1 sets the focus of the assessment by empirically characterizing the field, or "domain" in which ASB has actually operated over its existence, and the goals it has pursued. This is where we subsequently focus our empirical search for impacts, outcomes and uptake. With these preliminaries in place, we then turn to our assessment of the extent to which ASB has contributed to those broader changes in its domain. We devote one section of the chapter to results of ASB's work in each of the successive stages of uptake (Ch. 2.2), outcomes (Ch. 2.3) and impact (Ch. 2.4). In each chapter, following the approach outlined in Chapter 1, we trace to the extent possible the four closely interrelated pathways through which ASB research output might have had results in the real world: contributions to knowledge, to technology, to policy and to capacity to produce all of these.

2.1 Impacts on what? (ASB's goals and their relevance to the CGIAR)

Any program of the scope and energy of ASB is bound to have impacts on something. If we are to assess rather than merely characterize those impacts, we, therefore, need to specify "impacts on what?" Since ASB is intended to be problem-driven rather than blue-sky research, one important reference point we need to establish is the Program's own goals. Since the Program is an activity of the CGIAR, another is the relevance of the specific ASB goals to the broader objectives of the CGIAR itself.

Characterizing ASB's goals over the past decade is not straightforward. The Panel finds that one of the most striking features of ASB has been its own evolving definition of the problem it should be addressing, and thus the goal of its work. Retrospectively at least, the Program has portrayed its own evolution in terms of as a series of hypotheses that were empirically evaluated, found wanting, and replaced by alternatives. The Program began with a narrow goal of discovering solutions ("alternatives") for a presumed problem (forest and soil destruction via "slash and burn" agriculture practiced by poor farmers). Its early studies on the forces driving deforestation rejected this notion, showing both that other factors were responsible for much tropical deforestation, and that the initial goal of enhancing smallholder productivity could, if realized, in certain cases accelerate tropical deforestation by making conversion to forest-derived land uses more profitable. This realization led to a Phase 2 goal of discovering or designing "win-win" solutions which – through the right mix of technological change, institutional innovation and policy reform at the national level – could achieve both development and conservation. But this win-win hypothesis was rejected by the Program findings captured in the ASB trade-offs matrix that emerged in the late 1990s (Tomich et al. 1998). These findings revealed strong trade-offs between local and national

development objectives, on one hand, and global environmental concerns such as habitat conservation and carbon sequestration, on the other. Responding to this discovery, ASB revised its goals again to move beyond assessment of trade-offs to management of conflicting interests across stakeholders and across temporal and spatial scales. In this ongoing “negotiation support” era (van Noordwijk et al. 2001), ASB has shifted its emphasis from plots and households to landscape level analysis and toward an emerging goal of finding ways of rewarding rural communities for environmental services that are not valued in the market.

One result of this evolution in ASB’s goals and research foci is that the Program’s formal title (“Alternatives to Slash and Burn”) no longer encompasses what it actually studies. If used literally to define the goals of the Program and thus the scope of this Review, “Alternatives to Slash and Burn” would, therefore, significantly distort our assessment of the Program’s impacts. On the other hand, merely focusing on the most recent of ASB’s evolving goals would also provide an overly narrow reference point for assessing its decade-plus of activities and impacts. We, therefore, looked back over the historical record of ASB’s stated goals and actual activities in search of persistent elements that would help us define a more realistic but still bounded characterization of the Program’s scope and goals.

The Panel found that one constant in the Program’s evolution has been its focus on *land use interfaces*, specifically those between forestry, agro-forestry and agricultural uses. Another constant has been its integrated *ecoregional focus* on the *humid tropics*. The program has also continued to foster the joint goals of *poverty alleviation and biological conservation* or what many would call “sustainability.” Based on this analysis, we adopted for this Review an empirical issue framing of ASB’s work that includes most of the variants that have been implemented or seriously debated by the Program over the last decade. In particular, the Panel finds that the issue arena within which ASB has actually evolved and its actual goals within that arena, can be characterized as follows: “*the exploration of options for shaping land use at forest-agriculture interfaces in the humid tropics with a goal of raising productivity and income of rural households without increasing deforestation or undermining essential environmental services.*” This is an awkward, if accurate, program description for which we were unable to create a palatable acronym. When we have needed a shorthand for it to describe the overall scope of ASB efforts, and thus the scope of our Review, we have, therefore, simply referred to the (actual) “ASB domain” or “ASB’s issue domain.”

ASB’s “domain,” as so-defined, is a sizable one. Current estimates by the Program indicate that more than 1.8 billion people live within the tropical forest biome it addresses, of whom 1.2 billion are rural.¹¹ Most are poor households directly dependent on forest resources and agriculture for their livelihoods. Other poor households suffer indirectly from waste of these resources and environmental degradation. ASB’s stated goal of working within its domain to “rais(e) productivity and income of rural households without increasing deforestation or undermining essential environmental services” is thus one of great importance for the world, well aligned with the Millennium Development Goals for the reduction of poverty and hunger (MDG1) and ensuring environmental sustainability (MDG 7).

The Panel further finds that the goals the ASB Program has reshaped for itself are not only important to the world, but also well aligned with CGIAR’s historical mission to “achieve

sustainable food security and reduce poverty in developing countries through scientific research and research-related activities, ... increasing income and improving livelihoods, without harming the environment” (CGIAR Secretariat, 2004, p.3). The Program goals also fit squarely within the research priorities recently announced by the CGIAR Science Council, notably Priority 4a on Integrated land, water and forest management at landscape level, which seeks to promote “improved land use practices (that) contribute to increased and sustained productivity, optimal conservation, reduced conflicts and equitable use of land, water and forest resources in multi-use landscapes” (CGIAR SC, 2005, p. 57).

2.2 Uptake of ASB results

As defined in Chapter 1, of all the results that ASB may have on the outside world, “uptake” is the most removed from the ultimate goal of “impact” but is also the most immediate and most objectively quantifiable external consequence of the Program’s internal efforts. We defined “uptake” as a positive action of someone outside of ASB that results in the acquisition of ASB output and in exposure to that output by an audience outside of ASB. (This is distinguished from “outcomes,” the next stage in the results chain, by our defining the latter to involve not just exposure, but positive indication that the exposure has resulted in a change of beliefs or behavior.) The Panel determined that uptake of ASB outputs could be objectively characterized in 6 meaningful ways:

1. the acceptance of ASB output for publication by outside journals or book publishers that are selective in what they take up;
2. the accessing of ASB outputs from its web site;
3. outside requests to ASB for copies of any of its outputs;
4. invitations to ASB as a program or to its representatives to give scientific presentations or policy advice or to serve on studies or committees for selective audiences;
5. the attendance at ASB training and capacity building sessions; and
6. participation by others in the ASB network/consortium.

Publishing by independent venues

The Panel’s analysis of the ASB Database revealed on the order of 300 books and articles written by ASB authors and accepted (taken up) by outside scientific publications over the period 1993-2005 (mid year) (see Table 2-A).¹² The Program also published another 140 monographs and working papers in various publications of its own, its collaborating institutions or the CGIAR System more broadly. A generous view of *uptake* would encompass all of these publications. A conservative view of *uptake* would focus on those ASB results accepted for publication by independent journals and presses in what might be seen as the world outside of ASB and CGIAR – the world of truly global public goods. From the conservative perspective, outside uptake of ASB research results averaged about 25 publications (18 journal articles, 1 book, and 6 book chapters) per year of the Program’s operation. From the more generous perspective, including monographs published within the FAO/CGIAR System, the total comes to about 35 publications per year.¹³

Are these big numbers?

The obvious way to answer this question is to do comparisons in which the average number of publications taken up per year is scaled by the number of researchers involved in producing publications or the amount of research money expended. Such comparisons cannot be unproblematically applied to ASB however, since a central element of ASB's strategy (see Chapter 3) is that many of the "ASB authors" work in part or in full on other institutions' agendas and budgets. The Panel nonetheless developed two reference points for assessing the magnitude of uptake of ASB research publications:

1. *Uptake per expenditure:* The Panel believes that scaling uptake to research funds expended is likely to allow the most meaningful comparison between ASB and other research Programs. For ASB, we believe that the relevant budget is the sum of expenditures on global, regional and national programs (but excluding "associated Programs"). This amounted to US\$ 64.5M (constant 2004 US\$) over the period 1994-2004.¹⁴ ASB has thus achieved over its entire period of operation an average uptake rate of its research product by scholarly publishers of 3, 5, or 7 publications per US\$ 1M budget, depending on whether i) only journal articles; or ii) journals plus books and book chapters; or iii) all of these plus CGIAR-system monographs are included in the total. These numbers can be put into perspective through two comparisons. The most direct is for the CGIAR Centers as a group. For these, we have the performance indicators recently published by the World Bank, which use an inclusive definition of uptake equivalent to the (journals + books and book chapters + monographs) definition given above.¹⁵ For the 11 Centers for which data are available, the average uptake of these outputs has been about 5 per US\$ 1M budget (interquartile range of Center averages 3 to 7). ASB's comparable value of 7 articles per US\$ 1M budget is in the upper (higher uptake) end of this range.¹⁶ A less directly comparable but still relevant figure is provided by the US National Science Foundation's calculation of the average number of academic journal articles published per amount of academic research expenditure across all disciplines in each of the 50 US states. In recent years, the median rate among states has been about 4.5 journal articles per US\$ 1M of academic R&D funding (interquartile range of state averages: 3.8 to 5.0).¹⁷ ASB's comparable figure of 3 journal articles per US\$ 1M per year puts it in the bottom 10% of the US states in terms of their production of academic journal articles. The Panel finds this not especially surprising given that the US budget figures are for research expenditures only, excluding the base costs born by the universities' core budgets, and are for single facilities rather than the distributed programs of the CGIAR. These results are summarized in Table 2-B.
2. *Uptake per researcher:* There are reasonably good numbers suggesting that the average researcher in a reasonably well financed institution can be expected to have about 1 publication per year taken up by a peer reviewed venue. For example, in US research universities in recent years, the uptake of output by peer reviewed *journals* has been in the range of 0.5 and 2 articles per researcher per year, with a median of about 1.¹⁸ ICRAF's overall output of *all* peer-reviewed output (journals *plus* books and book chapters) has recently averaged about 0.7 per researcher per year.¹⁹ Other analyses give comparable results.²⁰ The Panel could not devise any satisfactory statistic to reflect a comparable number of full-time equivalent researchers involved in ASB. What we can do is run the analysis backwards, assuming that ASB is as "normal" in

uptake per researcher as it is in uptake per dollar of expenditure. This calculation suggests that the ASB Program has generated peer reviewed uptake *as though* it annually employed on the order of 20 full time normally productive researchers.²¹ (Table 2-A.)

What about quality of uptake?

The Panel assumes that, other things being equal, the likelihood that ASB results will have an ultimate impact on the world increases to the extent that its outputs are taken up by publication venues with a large and influential readership in ASB's domain. As we will see in Chapter 3, the Program had neither a formal list of such venues nor a formal strategy for placing its output in them. The Panel, therefore, conducted the quality dimension of its impact assessment by building a list of what it judged to be quality venues, and then comparing ASB's actual publication venues with that list.

1. *Journals:* For journals, we developed our comparison list of quality venues through a four step process. First, we asked a sample of leading researchers and policy analysts in ASB's domain what journals they regularly read. Second, we analyzed where work about ASB's domain was being published by non-ASB researchers, drawing on a variety of libraries, bibliographies, and experts.²² Next, we used ISI's "Journal Citation Reports" (2004) to extend the list generated by the first two steps by identifying additional journals that are similar in terms of the journals their articles cite, or are cited by. Finally, we ranked the resulting list in terms of the "impact factor" developed by ISI.²³ The result is a ranked list of journals that, in the Panel's view, are high impact venues which the ASB Program might reasonably have sought as targets for uptake of its research output. We then compared this potential list of "high impact" journals with the journals in which ASB research was actually taken up, again drawing on the ASB Publications Database for our information. Our findings are shown in Table 2-C. Two features stand out. The most striking feature of the data is that there has been virtually no uptake of ASB results in the highest impact journals that would have been plausible places to publish the Program's output, namely *Nature*, *Science*, or the *Annual Review of Ecology and Systematics*.²⁴ Indeed, uptake of about 30% of ASB journal output is concentrated in publications with little or no presence in the international arena. Some of what might be called these "low(er) impact" journals preferred by ASB may well have substantial impacts within the particular regions or institutions at which they are targeted. But it would be difficult to argue that they are the most mainstream venues for turning Program outputs into truly global public goods. Against this rather negative assessment it should be noted that the broad field in which ASB and the journals on our list operate is a dispersed one. ISI's Journal Citation Reports give an aggregate impact factor of only 1.3 for the "group" of multidisciplinary agricultural journals in which ASB's work would naturally fit, and a median impact factor for journals in that group of 0.44. Adjoining fields of forestry and agriculture/soils have even lower aggregate and median scores. The journal that publishes more ASB output than any other, *Agriculture, Ecosystems and Environment*, has an impact factor of 1.2. This is substantially above the median quoted above for those publishing multidisciplinary agricultural work and only slightly below the aggregate impact factor for field.

Looked at from this perspective, although ASB could have done a lot better, it could also have done a lot worse than it did in selecting the journals it has used to achieve the uptake of its output by a global audience of researchers and policy analysts.

2. *Books:* To assess the quality of the books involved in the uptake of ASB results, we developed our comparison list of quality venue through a 3 step process. As we did for journals, we asked key leaders in ASB's domain what publishers they respected and regularly reviewed for new acquisitions for their libraries. Next, we determined what publishers were represented in the bibliographies of key books written by those leaders and others they recommended. Finally, we reviewed the holdings of key libraries covering the ASB domain. The result is a list of book publishers that, in the Panel's view, would be venues with a potentially high impact on researchers in ASB's domain that the Program might, therefore, reasonably have sought as targets for uptake of its research output (see Table 2-D). We then compared our "high impact" list with the book publishers that actually took up ASB research, again drawing on the ASB Publications Database for our information. The results are shown in Table 2-D. They show that of the 90 outputs that ASB lists as "books" and "book chapters":
 - About 35% were taken up by internationally known publishers that have high visibility in the ASB domain.
 - Relatively few of these (only 10% of total), however, were taken up by the university press publishers that, in our judgment, have high visibility not only within but also beyond the ASB domain. The remainder (25% of the total) were taken up by CAB(I) and CRC publishers – clearly important players among specialists in the ASB domain, but not as widely distributed in the broader scholarly community as the university publishers.
 - Another 50% of the total appeared in publications of the FAO, CGIAR and partner institutions and were thus likely to reach relevant researchers who follow that somewhat grey literature but not necessarily those who don't.
 - About 15% of ASB's total "book + chapter" output of ASB was taken up by publishers that, in the view of the Panel, are not particularly visible to researchers and policy analysts interested in the ASB domain.

Visits to the Web site

As documented in Chapter 3, ASB has invested substantially in developing a web site to facilitate direct access to its outputs by interested users (www.asb.cgiar.org). It seems reasonable to assume that, other things being equal, the more visits to the site, and the more downloads from the site, the higher the uptake of ASB output by people and groups outside of ASB. Estimates of such statistics are – in principle – available from CGNET, which operates CGIAR's web services. The Panel assumes that such statistics must have been assembled and analyzed across the CGIAR, but could not locate a report that did so. In the absence of such comprehensive data, summary statistics for ASB and a cross section of CGIAR sites were extracted from CGNET by the CGO on the Panel's request and are used for the analysis presented here. These data give us trends for ASB and ICRAF, and current data for a larger number of CGIAR Centers.²⁵

Does the ASB Program have a significant presence on the web?

The Panel finds that it does. A “Google” search of “alternatives to slash and burn” or “slash and burn” or even the much broader ASB domain description developed by the Panel earlier in this chapter all bring up the ASB Program’s home web site at the top of the list. This indicates that the ASB web site is the one most likely to be read by people going to the web for information on the Program’s domain. (We found that CGIAR’s Systemwide and Inter-Center Programs in general do quite well on this score, mostly achieving the same “top of list” visibility as ASB. But the fact that it is CGIAR wide does not make this visibility any less worthy of note.)

How much use does the ASB web site get?

Between 2001 and 2004 (the first and last full years for which data are available), the annual number of both “unique visitors” to and “visitor sessions” with the ASB web site have risen about 10 fold.²⁶ This factor is inflated by the relatively low numbers for 2001, when ASB first started a serious push to increase its web presence. Nonetheless, from 2002 to 2004, the average annual growth rate of “visitor sessions” on the ASB web site was in excess of 30%. As a result of this growth, the average annual number of “visitor sessions” has now reached about 77,000.²⁷

Are these big numbers? The significance of the very high growth rates may not be quite what it seems because of a general rise in the use of the net over the period in question. The only closely comparative data we have is for use of the ICRAF web site, where the growth in “visitor sessions” over the same period was about 40% per year.²⁸ Given the known shortcomings of the data, however, we do not believe that this difference is particularly significant.

On absolute numbers, ASB has a visitor rate about 25% higher than that for CAPRI, the only other SWP on which data were available (see Table 2-F). On the other hand, its web site receives only between 10 and 15% of the number of visitor sessions as do full CGIAR Centers such as CIFOR or ICRAF. For comparative purposes, however, it may be more meaningful to scale visitor sessions to the budgets of these respective units. When this is done using annual budgets for the Centers and for ASB as provided to the Panel by the SC Secretariat, the results are strikingly in ASB’s favor. For 2004, ASB achieved twice the web visitor sessions per dollar of budget as did even the highest scoring Center (IFPRI, followed closely by CIFOR), and four times the mean for all Centers combined. Scaled in this manner, its sole competitor was the only other SWP for which we have web data: CAPRI, which did about as well in visits/dollar as did ASB (see Table 2-F). A case can be made, however, (as the Panel did when comparing uptake for publications) that for ASB the more meaningful budget number is not just the budget of the GCO, but rather that of the GCO plus its regional and national programs that contributed to the material on the site, if not to its direct maintenance. If this logic prevails, then ASB’s showing is less impressive, falling to half the mean for the Center (Table 2-F).

The Panel concludes that use of the ASB web site is increasing at a substantial rate comparable to (i.e. neither significantly less or greater than) that of ICRAF as a whole. We find the number of visitors to the site is impressive, comparable to or better than the performance of CAPRI, the only other SWP for which we have data. Relative to the Centers,

depending upon whether one believes that the relevant indicator of ASB budget is its GCO or its GCO plus regional program budgets, the Program is doing either 4 times better or half as well as the average Center. In either case, the much higher absolute visit rates to CGIAR Centers suggests that there remains an untapped potential audience remaining for ASB to reach through its web program.

How much was downloaded from the site during these visits?

Many site visits result only in a casual reading of material. But when a visit to the ASB web site also results in the active downloading of ASB results by a user, it takes on something of the character of acceptance of ASB output by a publishing house. The Panel found that a substantial amount of ASB material is in fact downloaded from the ASB web site. Total numbers are not regularly collected or reported on by ASB, but the data mobilized for the Panel by the GCO suggests an uptake of more than 50,000 copies (counting “session downloads”) of ASB documents and perhaps as many as 150,000 (counting “downloads”) from the ASB website during the four year period between 2001 and 2004.²⁹ Even given the Panel’s inability to assess exactly what proportion of these downloads are due to automated crawlers (perhaps 5% from the data available to us) or self downloads by ASB, these uptake figures greatly exceed the amount of uptake likely to come from *direct* purchase of or subscription to print publications. (Such print publications may, of course, get multiple readers through libraries or their own on-line availability.)

Shifting our assessment to examine the rate of uptake of individual ASB products, we find a median rate of about 270 “session downloads per paper per year” in 2004 (interquartile range 250 to 440).³⁰ We again emphasize that we lack enough information on how these counts were performed to be sure of how they can be fairly compared with uptake numbers from other web sites. We do note, however, that CGIAR’s CAPRI program – presumably using the same CGNET analysis tools as ASB – reported in 2002 that “CAPRI has been monitoring paper downloads from its web page for the last 2 years or so. The number of downloads ranges from 30 to 300 per paper per year.”³¹ With less conviction that the accounting methods are comparable, we note a report from CAPRI that the journal publisher “Elsevier tracks the frequency with which papers are downloaded from its journals via Science Direct. A high number of downloads is 50 per year.”³² Drawing on Panel members’ personal experience, we note that an environment and development review journal published in print but with an on-line, subscription-only web site views 300 downloads per year (in 2004) as high number.³³

The Panel concludes that uptake of ASB outputs via downloads from its web site is substantial: the *median* download rate for ASB outputs is comparable to or greater than the *high end* download rates from comparable web sites.

What kind of material was downloaded from the ASB site?

By examining the relative frequency with which various kinds of ASB outputs are downloaded from its web site, an important perspective can be obtained on which of those outputs is viewed as most interesting by the outside world. This perspective is a valuable complement to that provided by our analysis of publication by independent venues (see the preceding section) in that web visitors have potential access to all three types of program output – i.e. output relating to knowledge, policy, and capacity – whereas our analysis of

journal and book publications is almost certainly biased in favor of knowledge outputs and against capacity outputs.

The Panel found that total uptake via downloads from the web site is divided about equally among research results (e.g. working papers, working group reports and country reports), policy results (e.g. Policy Briefs and Voices publications), and capacity building materials (e.g. lecture notes).³⁴ The top 10 downloads include representatives from each of these 3 major categories, with the surprise being the very strong showing of ASB Lecture Note output (which the Panel classes as “capacity building”).³⁵ The least-downloaded outputs also include representatives from all categories, with the surprise being the very low rates for the ASB Voices series (classified as “action” or “policy”).

The Panel concludes that all three major forms of ASB output are valued by the outside community, as indicated by that community’s choices of material to download from the ASB website. The relatively high uptake of ASB Lecture Notes from the web site is particularly interesting, providing unexpected and objective evidence that ASB’s investments in producing global public goods for capacity building are being well received.

Direct requests to ASB for its outputs and expertise

The Panel sought to assemble evidence of uptake of ASB results through direct requests to the Program for its products and expertise. Available data proved to be spotty, but we found two sorts of requests for which quantitative data were relevant and available: requests for physical outputs, and requests for expertise.

Requests for physical copies of ASB outputs

ASB runs both a mailing list for physical distribution and an electronic listserv. Individuals join these lists only via direct requests. By the end of 2004, ASB’s list serve had 370 subscribers, with the number growing at more than 20% a year. Its mailing list for physical output had perhaps 1000 subscribers.³⁶

Policy/Action outputs represented by the ASB *Policy Briefs* and ASB *Voices* series are currently requested more than 100 times per year. Even higher uptake rates exist for the most popular knowledge outputs – the new *Agriculture, Ecosystems and the Environment* volume on ecosystem services seems likely to be requested more than 200 times in its first year of publication. Publications reflecting ASB’s findings on trade-offs – e.g. the 3 ASB chapters in Lee and Barrett “Trade-offs or Synergies” book³⁷ – been in sufficiently high demand to require replenishment of stock. So have most ASB country and thematic reports.³⁸

How important are these uptake rates through direct request to ASB for material? We could develop no useful comparison statistics. It does seem certain that uptake through direct requests for physical copies of ASB output is usually exceeded by rates of uptake of the same products from the ASB web site. Turning this observation into strategic guidance for the allocation of ASB effort would require information on differential outcomes, e.g. whether the physical copies reach systematically different audiences than the web copies. Unfortunately, this information has not been assembled by ASB and could not be assembled in the time available to this the Panel.

Invitations to advise, speak, or serve on committees

Invitations by important groups outside ASB for members of the Program to advise, speak, write, or review are a plausible indicator of the interest that those groups have in hearing about the Program's output. Since we assume that the "inviting groups" have limited "space" and lots of options, we see such invitations as analogous to decisions of important journals or press to publish ASB written output, and thus as potentially meaningful indicators of "uptake" of ASB results. Unfortunately, no systematic records of such invitations were kept by the Program. From incidental data available to us, however, it is clear that a number of important groups turn to ASB researchers for access to the results of the Program.

On the policy front, the World Bank invited ASB scientists to serve as panelists at its Workshop on Poverty, Environment and Growth Oriented Strategies (Washington, 1999); to contribute to its "Review of the 1991 World Bank Forestry Strategy and Implementation" and to review its "World Development Report 2003" and to participate as a member of the "Consultative Partnership on Forests of the UN Forum on Forests" and of the "Forest Landscape Restoration Partnership." It was also a founding member with IUCN and others of the "Rainforest Challenge Partnership." A number of requests from national governments have also been received, for example the Indonesian Minister of Forests' 1997 request to ASB/ICRAF for support in developing innovative approaches and policies to community forestry in the Outer Islands, and a request from the government of Thailand to advise on the national forest policy. In Southeast Asia, ASB research has fed inputs to planning policy and regulatory changes in economic policies distorting incentives to design integrated land use management at the margins. These incentives systems have also been analyzed with a view to establishing policies for implementing workable and effective transfer payment schemes for the production of environmental services.³⁹ Finally, interregional requests for advice across the humid tropic domain appear to have been substantial. Thus, for example, in 2004 and 2005 there have been requests by institutions in Peru, Brazil and Madagascar to draw on lessons learned from ASB's RUPES work in Southeast Asia.

In the research domain, ASB input has been sought for events ranging from the Global Biodiversity Forum (Jakarta, 1995), through the American Society of Agronomy Annual Meetings (Salt Lake City, 1999), to the World Congress of Environmental and Resource Economists (Monterey, 2002) and the World Conservation Congress (Bangkok, 2004). The Program was also chosen as the only sub-global assessment working across regions in the tropics to contribute to the Millennium Ecosystems Assessment. Its research on carbon stocks was invited to serve as an input to the Intergovernmental Panel on Climate Change. (We will return to the results following from these particular invitations in the following section on 'Outcomes.') A high level audience at the World Bank requested a presentation on ASB's work on the scientific base of the interactions between tropical forests and water, in particular its finding that some of the conventional wisdom on deforestation and flooding has in fact little foundation in science. Results are likely to be integrated in Bank staff attitudes and practice in the design of policies and projects for Bank support.

Narrowing our attention to the GCO, we note that for the last 3 full years (2002-2004) GCO staff accepted invitations to make an average of 10 major presentations per year. These were

given to both policy and scholarly audiences (including the World Conservation Congress, Convention on Biodiversity COP 7, Millennium Ecosystem Assessment, Ecoagriculture Partners, Columbia University, and Lund University).⁴⁰ Analysis of outstanding invitations shows that demand from important groups for ASB presentations clearly exceeds the capacity of ASB and the GCO to meet that demand.⁴¹

Participation in ASB capacity building efforts

ASB has attempted to build capacity in its domain through three sets of activities: i) training groups and individuals; ii) strengthening partner institutions; iii) contributing at an international level to the world's ability to pursue integrated NRM in the ASB domain. We evaluate ASB efforts to carry out such capacity building in Chapter 3. Here, we begin our assessment of the results of ASB's efforts by characterizing *uptake* in terms of people's and groups' willingness to participate in the opportunities that ASB creates.

How many people have participated in ASB training efforts?

We will see in Chapter 3 that ASB has vigorously pursued a program of training and capacity building efforts in pursuit of its goals. Just as the decision by a publisher to accept an ASB research paper for publication is an indicator of outside uptake of an ASB research output, so the decision by scientists or policy makers (or the institutions that employ them) to attend an ASB workshop is an indicator of outside uptake of an ASB training course.

Data provided by the GCO show that more than 4600 individuals have attended ASB group training courses over the period 1992-2004.⁴² Many of these individuals came from ASB collaborators and partner institutions and can be assumed to have strengthened ASB itself upon their return. Some of them have gone on to train others – often in large numbers, as suggested by the fact that thousands of farmers in southern Cameroon have received training in sustainable forest management as a result of ASB initiatives.⁴³

Another 130 people took part in individual training activities with ASB as post-docs, research fellows, and assistants. Two thirds of these were from the South; nearly half were women.⁴⁴ These numbers are impressive, as were the particular individual trainees met by the Panel. They are not, however, large by CGIAR standards. Perhaps three-quarters of the CGIAR Centers surveyed for the World Bank Performance Indicators (2003) trained more individuals. Even normalized by budget, ASB is near the bottom quartile of CGIAR *Centers* in number of individuals trained.⁴⁵ (Unfortunately, comparable data for participation in training efforts by other CGIAR SWPs were not available to the Panel.)

Participation in ASB's efforts to strengthen partners

To determine the extent to which ASB efforts to increase the capacity of the international system to perform relevant work in its domain have been taken up by that system, the Panel examined the extent to which an increasing number of partners chose to participate in work of the Consortium. We found that CGIAR networks clearly played a key role in establishing initial partnerships, both among international Centers and with national institutions. Subsequent changes in this initial core group of participants could be for a number of reasons, including intellectual, financial, political, etc. The fact that we cannot reliably

differentiate these motivations does not lessen our interest in knowing whether more, or fewer partners have been willing to work with ASB over the past decade.

The Panel determined that there has in fact been an accelerating growth in the number of ASB partner institutions that have “voted with their feet” to become associated with ASB. The numbers start with about 18 partner institutions in the early formative discussions of 1992 to 35 partners in 1994, to 50 in 2000 and over 80 in 2004.⁴⁶ This overall growth suggests that ASB has created not merely a supply of capacity building efforts, but a demand for those efforts as well.

The observed growth does not, in itself, speak directly to the question of whether ASB, in responding to the “demand” or interests of potential partners, has cultivated a strategically balanced and effective set of collaborators. The Panel finds that, in fact, it seems to have done so. The ASB Global Coordination Office has developed a functional typology of partners which supports the GCOs contention that the ASB consortium has engaged with different groups in ways that minimize the costs to them in terms of time and effort. The Program has shown a mature realization that participation can come in the form of specific and distinct (but not mutually exclusive) roles in governance, collaboration, consultation, and advice. The current distribution of partners, in the view of this Panel, deals effectively with balancing those roles.⁴⁷

Uptake of ASB capacity into broader efforts to pursue iNRM in the ASB domain

To what extent is ASB output taken up by the broader community – beyond its individual trainees and partners – as a contribution to the global public good of capacity to pursue integrated NRM in the ASB domain? Two sorts of evidence the Panel could identify relevant to this question have already been presented in this section. First, our data on downloads from the ASB web of its Lecture Note series showed a substantial uptake: the 10 most popular Lecture Notes have accrued more than 1000 “session downloads” since 2001, and in so doing have become the single most downloaded group of materials on the ASB web site. Second, the demand we reviewed for ASB participation on major international committees and commissions likewise represents solid evidence that the Program capacity constitutes a valued global public good in the ASB domain. Beyond these objective data, both previous reviews interviews and our own field visits and interviews strongly suggested that the ASB Program itself – its design, its network, and its operating procedures – was being taken up and emulated by numerous actors in the ASB domain. These findings could be presented here as “uptake,” but we have found them to make somewhat more sense when treated as “outcomes” that have changed the way that others work on problems within the ASB domain. We, therefore, present our findings along with other “outcomes” in the following section of the Report.

2.3 Outcomes of ASB

As defined in Chapter 1, the Panel treats *outcomes* in this Review as changes⁴⁸ in beliefs or behaviors relevant to the ASB domain that are plausible results – at least in part – of the uptake of one or more ASB outputs. As such, results that we classify as *outcomes* are more general and more important, but also less quantifiable and less directly attributable to ASB activities, than are results that we classified as *uptake*. On the other hand, *outcome* results

remain more quantifiable and more cleanly attributable than the ultimate results we will discuss under *impacts*. The Panel identified four sets of outcome indicators that could plausibly be attributed to the uptake of ASB outputs: 1) the citation or utilization of publications by ASB authors in the writings of others relevant to the ASB domain; 2) permanent linkages to the ASB web site by other web sites relevant to the ASB domain; 3) the adoption of ASB technology and policy outputs by users; and 4) the recognition of ASB capacity by others. Our findings are presented below.

Citations to ASB publications

Citation rates are a conventional but nonetheless useful indicator that knowledge results have not only been published but have also engaged the intellectual attention of others. Available citation indicators have many general and well-known limitations plus a few particularly relevant to ASB. The strongest indicators are for citations by articles in widely circulated, English language journals, which can be systematically assessed using ISI's on-line Web of Science, and idiosyncratically assessed via Google-Scholar. The worst are for citations by conventional (i.e. non-electronic) books and book chapters, which must be assessed individually, by hand. The situation is slowly improving for citations by electronically available books and reports, some of which are caught (but not systematically) by Google Scholar and Google Print.⁴⁹ Citations in publications other than English language journals are nonetheless still likely to be drastically under-represented in any assessment. It is worth bearing in mind, however, that the same tools used for assessment are used for research: when a publication remains relatively invisible to an assessment such as the one we conducted here, it is also more than likely to remain invisible to a substantial fraction of the research community. An analysis of citations to output authored by ASB scientists thus seems, on balance, one biased but informative and objective way of discovering to what extent those outputs are reaching beyond mere uptake by publisher to result in outcomes: changes in other people's ideas and arguments regarding ASB's domain. ASB had not conducted a systematic analysis of citation patterns of its published results. The Panel, therefore, performed such an analysis, and summarizes its findings below.

How frequently are ASB publications cited in mainstream journals?

To address this question, we began with all *journal* publications listed in the ASB Database up to and including the publication year 2004. Of the 200 journal articles listed in the ASB Database, we selected 158 for citation analysis, excluding 2005 publications, editorial matter, and other material not suitable for such analysis. We then employed the ISI Web of Science to check for citations to those journal articles, using all three of the ISI data bases (i.e. Science Citation Index, Social Science Citation Index, and Arts and Humanities Citation Index). Our analysis was conducted in February and March of 2005, and covers citations from the date of publication through the end of 2004. The Panel found 1076 citations in ISI up to the end of 2004 to the 158 ASB journal articles it analyzed. The scholarly literature is clearly noticing the articles produced by ASB-affiliated scientists.

But are these citation rates big or small? For comparison with other data, we normalized the total citation counts for ASB publications in ISI-indexed journals by the years available for citation. (This is to account for the fact that old articles are likely to have accumulated more total citations than new ones.) In particular, for each article we calculated the number of years that had elapsed between 2004 (the last year included in our count) and the year of

publication for each of the ASB articles we analyzed.⁵⁰ These numbers can be compared to the norms for articles published in ASB's domain that we quoted earlier in our treatment of uptake: an aggregate rate of 1.3 citations per article per year for all journals classed as "multidisciplinary agriculture" by ISI, a rate of 1.2 citations per article per year for all publications appearing in the single journal most often used by ASB, *Agriculture, Ecosystems and Environment*, and a rate of more than 30 citations per article per year in top general circulation journals *Science* and *Nature*. How do ASB's citation rates compare?

If we take the total set of ASB journal publications, we get a median citation rate of 0.4 citations per ASB article per year over the duration of the Program (interquartile range 0.0 to 1.8), substantially below comparison numbers quoted above.⁵¹ Before interpreting this apparently discouraging finding however, it is important to recall a finding alluded to in our analysis of uptake: many ASB articles (almost 30%) are published in journals not analyzed by ISI. This is not necessarily a bad thing – some of the journals in question are targeted at specialty professional communities or languages that are understandably not indexed by the general purpose ISI. The point remains that articles published in such venues are less likely to achieve the *world wide* notice and recognition that is achieved by results published in venues with broader visibility, and that makes them truly *global* public goods. The low number quoted at the beginning of this paragraph is, therefore, a real and potentially troublesome indication taken as a body, ASB journal output on average is not coming into global scholarly debate at rates typical of non-ASB publications in the globally read and cited literature.

Since ASB's strategy formally acknowledges a dual track of reaching regional as well as local audiences, however, another valid comparison is between the norms of the field quoted above and the citation rates to that 70% of ASB articles that are published in ISI-indexed journals. When we analyze this subset of ASB publications, we find a median citation rate of 1.5 citations per ISI-indexed ASB article per year (interquartile range 0.8 to 2.6), a number that compares favorably with the norms of the field. This suggests that it may be ASB's choice of where to publish, rather than the quality of its research that gives it the apparently low aggregate citation rates summarized in the previous paragraph. This interpretation is supported by a direct comparison between citation rates to articles by ASB authors and articles by non-ASB authors published in the same journals: for the 2 journals most frequently used by ASB authors (*Agriculture, Ecosystems and Environment*, and *Agroforestry Systems* that together publish just under half of the Program output appearing in ISI-indexed journals), articles by those authors are cited on average at a rate 1.6 times that of the average paper published in the same journals.

The Panel concludes that ASB's results published in globally circulated and indexed journals is cited by other scholars at rates consistent with or slightly higher than other works published in those journals. The Panel could not devise rigorous methods for evaluating the influence of the 30% or so of ASB journal publications that are not published in the global literature, but are rather targeted on regional audiences or languages.

How are ASB publications cited in electronically accessible media?

The advent of Google's "Scholar" and "Print" search engines is beginning to make possible a broader search for citation patterns in not just journals, but a whole range of electronically

stored media. These tools are still in the early stages of development, but do show substantial promise for getting around some of the pro-journal bias of ISI. Since much of ASB's output is published in other than journal venues, we explored what resulted from using variants of the phrase "alternatives to slash and burn" with both engines. The results with "Scholar" were not surprising: most hits were to journal articles already surfaced in our ISI searches, with a few additional ones to official ASB Progress Reports. That said, citations to documents by ASB authors dominated Google Scholar's findings when searching for "slash and burn" phrases. ASB authors clearly play a substantial role in shaping thinking about this topic.

The Google Print search, on the other hand, was most illuminating. A substantial number of both recent books (the only ones likely to be accessible electronically) and important reports (which have been electronic for a longer period) cite and discuss ASB results. A few of these citations had already been reported to us by the ASB GCO. But many had not. Given the early stage of Google Print's development, the results we obtained are not quantitatively meaningful, and cannot be compared with any obvious reference case. But the results do suggest that ASB results are being cited in a larger number of contemporary books and reports dealing with tropical agriculture, forestry conservation, and sustainability than we (or ASB) had appreciated.

How well cited are ASB publications in the Panel's "Gold Standard" documents?

Recall from Chapter 1 that the Panel adopted as part of its assessment a "Gold Standards" approach. In general, we selected what we judged to be significant contemporary venues in which we believe that evidence of ASB's results should show up if the Program is in fact exerting a significant influence on the world (see Chapter 1, Table 1-1 for a listing of the "Gold Standard" publications). For this section of our Review, we analyzed the "Gold Standard" publications to determine whether, and to what purpose, ASB results were cited in them.⁵²

The Panel's analysis of ASB citations in its "Gold Standard" selections revealed a presence of Program authors in every one of those selections. The median number of citations to ASB authors among the "Gold Standard" documents was above 8. Many but not all of the documents had additional references to the Program as a whole.

At the low end, Moran and Ostrom's (2005) edited volume on local and state institutions involved in forest management around the developing world cited only 4 ASB authors. At the high end, the Millennium Ecosystem Assessment has elected to use the ASB Program and its results as the anchor for cross-cutting assessment of "Forest and Agroecosystem Trade-offs in the Humid Tropics." The Panel examined the draft of that report and finds that when it is published later in 2005 it – and thus the MEA's view of ASB's domain – will be dominated by ASB authors.

More generally, the "Gold Standard" citation patterns reflect for general scholarly publications on forests, agriculture and development the same average to modest presence that we identified in our analysis of journal citations. ASB is by no means invisible to this broader academic community, but it does not have the footprint in breadth or number of citations that, in this Panel's view, the quantity and quality of its results might justify. On

the other hand, the Panel found that ASB has a substantial to dominant presence – as reflected in citations to its work – among the institutionally authored or sponsored “Gold Standard” documents we examined. The IPCC (2000) Special Report on “Land use, land use change and forestry” has so many references to ASB that we stopped counting. The dominance of the MEA’s cross-cutting assessment by ASB has already been noted. The weakest case is the World Bank’s 2005 work on “Sustaining forests: A development strategy,” which carries only a half dozen or so citations to ASB authors. Looking at the Bank document more closely, however, reveals a habit giving credit to ICRAF for what is clearly (in the view of both the Panel and the ICRAF management we interviewed) the work of ASB.⁵³

In summary, the Panel finds that ASB results in both the science and policy realms are recognized in every one of the publishing venues that we selected, a-priori, as representing the most important research and policy documents touching on ASB’s domain.

What particular results of ASB are most cited by others?

The journal citations to ASB results assembled by the Panel turn out to focus predominantly on the Program’s work in the basic natural science of soils, nutrients, and carbon storage. In part, this reflects the fact the Program’s early work did concentrate in these areas, and its early publications have had more time to generate citations. The pattern persists, however, when we normalize to years since publication of the cited article: the outcomes for which ASB is most widely “known” – in the sense of providing a scientific base that many other researchers and analysts cite and build on – are its soils, nutrients and carbon work, with special emphasis on its contributions to building and testing pan-tropically methodologies for their measurement. This is especially true when the search for citations is restricted to the widely read journals covered by ISI.

Citations to ASB results from books and reports identified through Google Scholar and Google Print tell an additional story, however. Although these sources also pay more attention to soils, nutrients and carbon than to any other topic, they also refer frequently to ASB’s policy work. In particular, they cite ASB’s matrix methods and findings, its argument that the “alternatives” debate must be about trade-offs rather than “silver bullets” and – to a lesser extent – its work on scenarios and negotiation support. Many of them also take note of ASB’s work on fires and on *Imperata*. On the other hand, the books and reports we analyzed fail to give substantial attention to ASB’s outputs on watershed policy reform, or its particular technology innovations such as rubber and pasture rehabilitation. Comparably little is cited on the Program’s work in evaluating ecosystem services, or compensating poor people for sustaining those services.⁵⁴

The Panel’s analysis of the treatment of ASB results in our “Gold Standard” documents confirms and extends the conclusions of the analyses reported above. The Program’s work on methods for measuring both below ground biomass and soil carbon fluxes associated with different land-use practices is clearly recognized as central and definitive by the IPCC. ASB’s work on institutional incentives for forest management by smallholders, on the other hand, is as weakly reflected in the “Gold Standard” documents as it is in the broader literature. On the other hand, the “Gold Standard” documents establish beyond doubt that ASB is recognized for its trade-offs work (the “ASB matrix”) and, more generally, for having

defined the state-of-the-art on research-based cross-sectoral approaches to shaping policy and lending in the ASB domain.

All in all, the Panel finds that ASB results are recognized through citation in the literature by the world's relevant scientific and policy communities, not only as a natural science program, but as a policy program as well.

Permanent linkages to the ASB web site

When an organization operating a site on the World Wide Web chooses to link to the site of another institution or program, it is making a statement analogous to that of a scholar citing a research result. In other words, the number of possible sites (or cites) is large, and only a few can be selected as worthy of regard. The Panel, therefore, asked as another indicator of ASB outcomes the extent to which its website is referred to by the web sites of other programs.

Using Google's "link" tool, we discovered 28 such "backward" linkages to the ASB web site (i.e. to www.asb.cgiar.org).⁵⁵ These links came from at least 5 countries as well as a number of global web directories. Taken together, they suggest that ASB is seen by others as a significant player in the domains of "forests and rainforests" and "agroforestry," and – to a lesser extent – in the domains of "tropical agriculture" and "ethnobotany."

Are the 28 links to ASB a lot or a little? To answer this question we performed the same "link" analysis for a number of other CGIAR Centers and System-wide programs, as well as a number of other sites relevant to the ASB domain. Though there are many factors that might influence such a comparison, the clear answer that emerged is that ASB does relatively poorly. CGIAR's SWP on Integrated Pest Management has even fewer linkages to its site than ASB. But every other SWP we checked, every other Center, and every other domain-related site (e.g. that for Forest Trends) has a substantially greater number of links to its web site than does ASB. (For example, the SWP on Participatory Research and Gender Analysis has 41 links, Forest Trends has 75, ICRAF has 388, CIFOR 785 and IFPRI has 1050.) The Panel concludes that external linkages to its web site is a potential outcome in which ASB has had some but – in relative terms – apparently quite limited success. In this sense at least, ASB cannot argue that it is seen as an indispensable resource by most other organizations working in its domain.

Adoption of ASB findings, methods, technologies and policy outputs

In this section we turn to the assessment of ASB outcomes focused explicitly on the world of action. To do so, we searched for evidence of the adoption of ASB findings, methods, technologies or policy outputs by users. We begin with an analysis of results achieved with one of ASB's principal mechanisms for reaching the world of action, its *Policy Briefs* series of publications. We then turn to more general evidence of outcomes in the arenas of analytic methods, technologies and practices, and policy reforms.

ASB Policy Briefs

As described in more detail in Chapter 3, ASB has attempted to bring its core policy findings to the attention of the policy community through a series of *Policy Briefs*. Given the intended use and audience for these *Policy Briefs*, it was not reasonable to assess the effectiveness of

this set of outputs through citation counts. The Panel, therefore, conducted a survey to provide the necessary data. The survey engaged policy makers, policy advisors, practitioners, researchers, students and others on the ASB listserv, and aimed at measuring the outcomes of the ASB *Policy Briefs*.⁵⁶ Results of the survey show that three-quarters of those responding to the survey see the *Policy Briefs* as *relevant* (21% scored relevance 'Excellent'; 51% 'Very Good') and *credible* (20% 'excellent', 54% 'very good'). More than a third of the respondents reported using the *Briefs* in their work (mean for all *Briefs* 35%, interquartile range 27-44%).

About one fifth of the respondents reported that they believed that the *Briefs* had influenced the beliefs or behaviors of key players in ASB's domain. Examples given included debunking myths of deforestation and water management, legitimizing agroforestry practices in Cameroon, clarifying the causes of forest burning in Indonesia, simplifying regulations in Brazil, clarifying land tenure of community agroforesters in Indonesia, and making the case for including land use options in debates over Clean Development Mechanisms within the context of international climate change negotiations.⁵⁷

Analytical methods

The Panel finds that the Program has been responsible for substantial advances in the use of innovative analytical methods based on a holistic, multidimensional approach to assessing land use options. These tools are beginning to be adopted by institutions outside the ASB consortium, by policy advisors in government and other institutions of the international community to plan their activities, and to inform the global debate on sustainability issues at the forest-agriculture margins.

The most impressive example is the "ASB matrix" approach to documenting trade-offs among multi-stakeholder criteria for assessing benefits of alternative land use practices.⁵⁸ This has been adopted as a tool for sustainable land management by the World Bank and by FAO.⁵⁹ UNDP-GEF has utilized this ASB methodology in the design of a US\$ 16M, 7-year project in Brazil. The Indonesian Director of Forestry Research has used the ASB Matrix for Sumatra in international negotiations. The adoption of the matrix has not been limited to large and official entities. For instance, villagers Rantau Pandau, Jambi Province in Sumatra have observed that the ASB Matrix could be useful in their negotiations with officials of the government about compensation for land at national park boundaries. ASB has also been asked to provide advice on the possible use of the Matrix in the redesign of the forestry sector in Kenya. This methodological innovation is fully consistent with the need to plan and manage action in complex landscapes integrating multiple dimensions of impacts on various objectives, actors and locations. What is most interesting in terms of potential impacts is that the matrix can be used as an effective analytical tool to assess impacts of alternative patterns of management in other fields and situations and not only to those restricted to the agriculture-forest margins. It can, for instance be used to analyze the impact of various penetration road options or to examine those of alternative schemes of timber concessions management.

An emerging area of methodological contribution by ASB Centers on the potential for provision of regional or global environmental services by the landuse practices of poor people working at the forest margins in the humid tropics. As already noted, ASB's work on

measurement of such services – especially as documented in its recent special issue of AgEE – is achieving wide recognition, reflected in high rates of downloading from the website, requests for physical copies, and invitations for presentations. Beyond this, however, ASB has been centrally involved in the highly innovative work on developing and testing best practices for rewarding poor people for environmental services. These practices were initially developed through the RUPES project in Indonesia and elsewhere in SE Asia. But the SE Asian results are being explored and adapted in the context of ASB work in Brazil and Peru, with interest expressed in Cameroon and Madagascar. There seems to the Panel a good possibility that ASB approaches to rewarding the poor for the provision of larger scale environmental services will rapidly emerge as a pan-tropic prototype disseminated through South-South exchange.

Technologies and practices

ASB research has helped to bring about a range of significant actions reflecting improved understanding of the complex multidisciplinary, multi-stakeholder interactions at the tropical forest-agriculture margins. ASB research has led to the design of new technological packages that are integrated with economic, social and environmental analyses of ex-ante impacts to increase their adoption and dissemination. Typically, much of the results of this research take years to test and disseminate. However, there is evidence that research at the ASB benchmark sites has already begun to influence natural resources management practices in ways that have led not only to income and environmental benefits but also to avoidance of substantial economic and environmental losses, as well as of occurrence of damaging conflict.

For example, a significant outcome of research in Acre, Brazil is the voluntary adoption of improved pasture management technologies over 80,000 hectares. Similarly, in Cameroon ASB has facilitated the adoption of environmentally friendly palm-based agroforestry practices in lands that previously were managed as palm monocultures. At the same time, it has emphasized the adoption of methodologies to improve livelihoods of small scale farmers. Palm agroforestry research started in 1998, but only 10 farmers had adopted this method in 2000-2001. By 2005, adoption was well into the exponential phase of the dissemination curve, with 1,000 farmers participating in the scheme.

Policy reforms

The Panel's examination of the documentary record and its interviews have convinced it that ASB has contributed directly to the design of innovative policies, legislation and institutions across its pan-tropic domain.

For example, ASB partners participated in and provided analytical inputs to national debates on national forest policy in Brazil, Thailand, Peru, Laos, Kenya and Cameroon. In those countries, the resulting policy reforms have been consistent with the joint objectives of economic expansion, poverty alleviation and environmental quality promulgated by ASB.

This is particularly the case for work related to the recognition and rationalization of traditional rights to forest land tenure and access and the policy reforms that are needed in Indonesia and Thailand. Arguably, relevant legislative reforms in these countries owe their

existence in no small measure to research results and dissemination to the public by ASB of the consequences of ignoring these rights.

ASB policy research in Indonesia contributed to the reform of trade and marketing policies for rubber wood which has the potential to benefit many of the 7 million people in Sumatra and Kalimantan who depend on rubber agroforests for their livelihoods.

Many of these national experiences have a significant potential for replication and have provided valuable insights and knowledge that is increasingly being made widely available as a global public good.

ASB has influenced the design of a policy related to imperata grass and the creation of a new Ministry of Forgotten Lands in Indonesia. ASB partners in Brazil have collaborated with the Joint Commission of the Senate and House Representatives in the revision of the National Forest Code, which has central implications for land use practices. And in at least one case in Brazil, ASB researchers have secured a substantial simplification of regulations for smallholder forest management.

At the international level, ASB research has clearly influenced the reevaluation and design of the new World Bank forest policy and has shaped the new World Bank Operational Policy (2004). Consider, for example, the following quote from the World Bank's 2005 forest development strategy:

*"Most of the poor who live in or near forests are associated with some form of agriculture and are significantly dependent on nearby forests for aspects of their livelihood... Policies and projects need to be analyzed and coordinated to ensure a cross-sectoral approach to planning and implementation of SFM and forest conservation and development. The Bank's strategy will give special emphasis to supporting the large number of rural poor living within forest margins or outside forests (predominantly agricultural populations) who are able to access forests, tree stocks outside forests, and trees on farms, and to respond to market opportunities. Forestry assistance will be defined broadly to encompass all tree stocks and activities on which they are based... Closer linkages will need to be developed with agencies such as ICRAF and the Center for International Forest Research (CIFOR), which have considerable experience in designing and implementing these options."*⁶⁰

This clearly represents a change in Bank policy relative to its views in the early 1990s. The rationale for the change is not directly attributed to ASB or anyone else, as is typical of Bank publications. But the change is clearly consistent with the proposition that ASB results have contributed substantially to the outcome of a changed lending strategy of the Bank in matters central to ASB's domain.

Recognition of ASB capacity building by others

Developing objective data on which to base an assessment of ASB outcomes in the realm of capacity building proved particularly difficult for this Panel. In the end, we elected to treat as "outcomes" (rather than merely "uptake") those results of the ASB Program that we believe have changed the way that other researchers and analysts active in the ASB domain are able to conduct their work. These are admittedly relatively subjective findings. We

nonetheless feel confident in our conclusions given the range of independent testimony that underlies the results we present below, and the plausible causal connection between ASB's intentions (Chapter 3) and the results we observe.

The ASB Program has been widely recognized by other reviewers as developing an exceptional capacity for multi-disciplinary, multi-scale research and action on problems of global significance. For example, the first CGIAR review of its Ecoregional Programs concluded that already in 1999 "The Alternatives to Slash and Burn Program has gone further than the others in relating its research sites to the whole area over which the problem occurs, and in scaling up to the global level in its findings on trade-offs ... This is very helpful for the global debate on sustainability issues" (CGIAR 2000, p. xix).⁶¹ The unique value of this capacity was confirmed, and the elements that went into creating it were recognized, in a meta-analysis of the CGIAR's iNRM work conducted for the World Bank's overall review of the CGIAR in 2003: "ASB has been applauded ... for innovative field research, strong science, and for going furthest within the CGIAR toward implementing effectively a holistic, ecoregional approach founded on in-depth local research linked methodologically across long-term benchmark sites around the world to permit effective scaling up to global level. The intellectual value of this work has derived from the synthesis afforded by careful methodological coordination across sites on different continents, and close working relationships with ARIs [advanced research institutes] and NARS [national agricultural research systems]" (Barrett, 2003, p. 15).⁶²

This Panel's interviews with representatives of ARI's, NARS and the independent research community confirm and deepen these comparative findings, crediting ASB with developing useful, used, and emulated capacity in at least three areas:

- i) *Scaling up from local anecdote to global science*: The systematic, pan-tropical approach of ASB to implementing common research protocols across a strategically selected range of "benchmark" sites was noted by several of the Panel's respondents as responsible for advancing understanding of shifting cultivation and other land use practices on the forest margin from the realm of anecdotes to acceptance as an arena of scientific inquiry that could generate generalizable and transferable scientific findings. The worldwide network of NARS and ARIs now interacting through ASB's benchmark system was cited by many as their "standard" for how productive international collaboration on NRM challenges should be organized.
- ii) *Integrating natural and social sciences*: On ASB's capacity for interdisciplinary integration, one respondent from a major international program outside of the CGIAR praised ASB as being out ahead of everyone, including the World Bank and GEF, in recognizing the need in iNRM for approaches that incorporated both natural and social sciences, and for developing effective responses to that need. Other dimensions of the Program's interdisciplinary capacity were cited by a number of other respondents from both within and outside the CGIAR. In particular, one analyst who specializes in modeling complex human-environment systems said that when other programs asked how to build and implement a capacity for such modeling, he simply tells them to emulate ASB.
- iii) *Linking research and action for iNRM*: On the matter of linking science and policy, one leading scholar from the global environmental change research community emphasized

ASB's capacity for and exemplary approach to linking the research and action communities on matters of land use change and management, as well as its skills in conveying complex research findings to policy makers. Another pointed out that ASB had let the way in demonstrating how stakeholders with radically differing agendas could be brought together to create shared and mutually trusted knowledge.

ASB's record of capacity building in its domain, while impressive, is not without its critics and shortcomings. For example, its "scaling up" efforts do not appear to have been adopted particularly widely beyond the Program's initial benchmark sites. Several respondents note that the integration of natural and social sciences in ASB work remains both incomplete and tenuous, with notable shortfalls in the arena of institutional analysis and, perhaps, a decline in the number of leading natural scientists engaged in the core research effort. And efforts to link research with policy have been only partially successful where the state and regional forest policy apparatus is weak – a not uncommon situation in the humid tropics. These shortcomings notwithstanding, the Panel concludes that a substantial and significant outcome of ASB's activities over the last decade has been the creation of an important and at least partially replicable capacity for harnessing research to the task of advancing sustainable development in the ASB domain.

2.4 Impacts of ASB

As noted in Chapter 1, the difficulties of assessing ultimate impacts in complex multi-disciplinary, multi-stakeholder iNRM programs operating at different scales and across regions are formidable. They include identifying unambiguous cause and effect chains in environments where typically there is a multitude of entities and forces contributing to impact; time lags between research results and eventual variations in those aspects that are of value to society; and the lack of widely accepted standardized indicators to quantify these variations. Even if these indicators were available, the all-encompassing features of iNRM programs would require for unambiguous assessment long term tracking of a number of variables. In reality, however, reliable data are hard to obtain. Time lags may be considerable in programs such as ASB that may be too "young" to exhibit their whole array of potential impacts: changes resulting from iNRM research are not likely to materialize before periods spanning perhaps ten or more years after research starts. If this were not enough, the variability of biophysical, cultural, political and economic conditions surrounding individual experiences make generalizations problematical.

Keeping these caveats in mind, this Panel adopted a three-pronged approach to characterize plausible, ultimate impacts of the ASB Program. First, we examined the extent of the correlation at the global (pan-tropic) level between changes observed in ASB's domain since the Program's inception and the results that have been documented for the Program. Where we found no or negative correlation, we are prepared to conclude that ASB has failed to demonstrate significant impact on the relevant properties of the world. (This still leaves open the possibility that a significant ASB impact will emerge later, or that its effects have been swamped by other influences.) Where we did find a positive correlation, we are prepared to conclude that there exists a corresponding *possibility* that ASB results have helped to cause the observed changes in the world. Due to the lack of controlled or replicate conditions, such causation is virtually impossible to establish, even if it in fact exists. Our

willingness to conclude that ASB has probably contributed to the observed changes increases, however, to the extent that in our own judgment, or that of other experts we interviewed, a plausible causal “story” underlies the observed correlation.

Our second, complementary, approach utilizes the general finding of research that has traced the influence of research on action that new discoveries and innovations generally find initial expression at the local and national level, from which they subsequently spread to regions of the world as a whole. Thus, this Panel looked for evidence that ASB results were having an impact on the Program’s benchmark sites and then performed its own subjective evaluation of the likelihood that these impacts would spread more broadly. We acknowledge that isolated local impacts, even if extremely positive, do not guarantee wide dissemination and multiplication. But we note, again, that a total absence of such experiences would strongly suggest that ASB impact has been minimal or non-existent altogether. Further, even a single individual experience may have potential for a large impact if the changes introduced are also substantial.

Finally, the Panel attempted to keep in mind that, in addition to examining highly visible and measurable changes that may attributed to research, a good assessment must also strive to scrutinize the often much less apparent results that help to avoid costly mistakes. These impacts are frequently ignored because – while research takes place - not much seems to have changed in reality. For example, stopping a policy reform that would have likely resulted in large resource degradation and disastrous worsening of the condition of the poor in areas of the forest-agriculture margins is an action that will not show discernible physical alterations on the landscape. However, the impact of such an action may be significant. The Panel, therefore, attempted to allow for such cases in its assessment of the ASB results.

We implement this approach to our assessment of ASB’s ultimate impacts below, beginning with a review of how ASB’s domain has changed over the period since the Program’s inception.

How ASB’s domain has changed since 1992

To evaluate the ultimate impacts of ASB on its domain, it is essential to appreciate how that domain has changed – disregarding ASB’s possible role in that change – over the period spanning its conception and existence. In particular, it is important to know how the world has changed relative to ASB’s specific objectives of “raising productivity and income of rural households in the humid tropics without increasing deforestation or undermining essential environmental objectives.”

For convenience, the Panel chose to delineate the relevant period as beginning with the UN Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992, and extending to mid-2005 when we completed this Review. Since ASB did not formally commence until 1994, in the text that follows we will often refer to the period assessed in this Review as “ASB’s decade.” To characterize how informed opinion in the international community regarding ASB’s domain had changed over that period we consulted a number of sources. These included comparisons of the preparatory materials for the 1992 UN Conference on Environment and Development and for the 2002 World Summit on Sustainable Development; of the World Bank’s World Development Reports on development

and environment issued in support of those two meetings; of the background discussion in ASB's initial proposal to GEF and its recent "Rainforest Challenge Proposal"; of the "Gold Standard" contemporary documents we introduced in Chapter 1; and interviews with a number of experienced individuals from both within and beyond the CGIAR System. We summarize our findings below.

The ASB Program was conceived at a time when traditional framings and strategies of development, focused mainly on promoting economic growth, were beginning to shift toward an increasing preoccupation with poverty alleviation and environmental management. Much of the early articulation of this shift occurred during the preparations for and immediate follow-up to the UN's 1992 Rio Conference on Environment and Development (WCED, 1987; World Bank 1992; UNCED 1992 [Agenda 21]). The contemporary form of this evolving framework is well illustrated in the UN's Millennium Development Goals and material produced in conjunction with the UN's decadal follow up to the Rio Conference, the 2002 Johannesburg World Summit on Sustainable Development (UN, 2000; WSSD, 2002; etc.). One implication of this growing importance given to poverty and environmental issues was increasing attention to the degradation of the landscapes at the forest-agriculture margins, as this is the place where as many as 1.2 billion people, including some of the world's poorest populations, live and subsist in precarious conditions. It was in the midst of this shifting attention that the ASB Program took shape in the early 1990s.

Overview: During the period of the ASB Program's existence, it must be acknowledged at the outset that the need for progress toward achieving its goals has if anything increased. Although there are places on the tropical forest margins where human livelihoods have improved and environmental degradation has slowed during the last decade, such positive trends remain the exception rather than the rule. The general picture remains bleak, with both poverty and deforestation continuing to increase in far too many places throughout the humid tropics (FAO, 2005; Snel, 2004; Achard et al., 2002).

Knowledge: ASB's decade, however, has also seen a fundamental transformation in thinking about both the challenges of, and the opportunities for, "promoting sustainable agricultural development based on the environmentally sound management of natural resources" on the tropical forest margins. Thinking related to immediate and underlying causes of resource degradation and its impacts on the poor and environment as well as to actions to remove those causes has evolved substantially. The prevailing view has shifted away from its early focus on the slash-and-burn practices of migrant smallholders as the cause of an environmental "crisis of deforestation." It has moved toward a significantly more nuanced appreciation of the multiple causes of deforestation, acknowledging a large number of pull and push forces that affect activities at the forest agricultural margins. In contrast with previous conceptualizations that tended to view deforestation as shaped by one or few types of actors (shifting cultivators, large logging companies...) or inducing forces (poverty, population...), modern understanding emphasizes the *complex interaction* of a large number of factors. It also stresses multifaceted links between diverse actors with often conflicting motivations and influenced by various market and non market forces and government regulations that determine outcomes. There is also a broader appreciation of the sophisticated ways in which smallholders actively manage complex landscapes at the forest

margin for food and livelihood security. It is now understood that deforestation and resource degradation is an enormously complex phenomenon.

Action: The search for appropriate responses has shifted accordingly, and has engaged an increasing variety of indigenous, civil society, and international actors. It is now recognized that the early exclusive emphasis on technologies to enhance smallholder productivity without considering social, cultural and economic forces affecting livelihoods and poverty has not contributed to reducing deforestation and forest degradation rates. Further, it is increasingly understood that government policies need to be reformed to create a more favorable environment making a more intensive use of market forces and financial and other incentives, rather than relying on relatively ineffectual command and control regulations.⁶³ More generally, it is increasingly appreciated that fundamental trade-offs usually exist among the land use options that most effectively secure local livelihoods, those that advance national development objectives, and those that promote global environmental concerns. One central challenge is organizing direct action by working with rural communities to find ways in which they can enhance their livelihoods while adopting production and management technologies that provide regional and global environmental services that are not adequately valued in the market. Another has been reforming the policy environment to induce desirable action in the direction of reducing poverty, improving the environment and generating economic growth. Globalization has sharpened the perception that linkages associated with economic expansion, environmental quality and quality livelihoods of the poorest exceed national boundaries in a world of increasing interdependences and that, therefore, responsibility for technological advancement and policy reforms in these areas is partly also a global one.

Capacity: The decade of ASB's existence has seen major changes in the world's capacity to address questions of sustainable land use at the forest/agriculture margin in the humid tropics. The capacity to monitor such changes on a global basis has increased substantially, as evidenced both by the maturing state of remote sensing and the improving quality of available data sets (CGIAR SC, 2005; Achard, 2002). The capacity to sort out cause and effect relations underlying land use changes has also increased, as reflected in the LUCC Program of the International Global Change Programs and its success in bringing natural and social science perspectives together to address the causes and consequences of land use change world-wide.⁶⁴ The capacity of some IARCs and NARs to work in this area has increased substantially, as has the professionalization of forest management personnel in parts of the humid tropics. Unfortunately, this is not a uniform trend. For example, FAO has recently documented serious erosion in the capacity for training and retaining professional foresters in much of tropical Africa.⁶⁵

In the next section, we begin our assessment of how well ASB results have been aligned with these observed changes in the ASB domain.

Impacts of ASB on Knowledge

Having an impact on knowledge of the ASB domain means, in the view of the Panel, changing the way that people think about the overall system of causes and effects relevant to that domain. Such impacts can be "local" – affecting just a few particular people in a few particular places – in which case they are not particularly distinguishable from "outcomes"

measured in terms of changes in beliefs of those specific targets. The more interesting and distinguishing case on which we focus here is when the impacts are regional or even global, affecting how people throughout the world think about the system of causes and effects shaping the dynamics of the ASB domain.

The ASB Program, as initially named and framed, can be seen in retrospect as having reified a perniciously simplistic misconceptualization of what are now understood to be the underlying relationships among human livelihoods, economic growth and resource conservation at the forest / agriculture interface in the humid tropics. As one CGIAR leader who is generally sympathetic to ASB put it, “As originally presented the program was dramatically wrong: since slash and burn was not the problem, alternatives to slash and burn were not the answer.”

To the Program’s credit, it relatively quickly realized the shortcomings of its initial framing and came to play a leading role in articulating the more nuanced modern view of its domain that we summarized above. Several elements of that modern view are well aligned with the ASB results summarized in this Report, and thus might plausibly be attributed at least in part to ASB activities. These include an emphasis on the importance of smallholders’ active management of land at the forest margin; the multiple actors involved in land use change at the forest margin; the multiple services provided to those actors by land at the forest margins; and, more generally, the complex dynamism of what we have called the ASB domain. In fact, every major difference the Panel identified between how the world of 1992 and the world of today understand the underlying human-environment interactions at the forest margin in the humid tropics reflects a change that the ASB Program was active in promoting. By and large, ASB was not the first to note or discover novel elements of the modern understanding. Rather, as noted earlier, the Program’s principal contribution was to help transform anecdotal understanding of specific locales into globally accepted scientific knowledge of an entire eco-region. As is discussed in more detail in Chapter 3, ASB accomplished this through a rigorous program of comparative interdisciplinary research grounded in a pan-tropic set of benchmark research sites and promulgated through results published in the peer reviewed literature.

Several additional ASB results that were discussed above under “outputs” do not yet seem to have transformed *world* thinking about causes and effects of land-use change at the forest margin in the humid tropics. For several of these results, however, their demonstrable impacts at particular locations, when combined with a plausible case for the generalizability of those impacts, lead the Panel to conclude that ASB is likely in the near future to contribute to additional impacts on global thinking about land use at the forest / agriculture margin in the humid tropics. These emergent ASB impacts, in the judgment of the Panel, include the Program’s work on ecosystem services and its exploration of ways in which poor people might be compensated for sustaining those services as a regional or global public good.

What impacts on knowledge might have been expected from ASB results, but have in fact failed to materialize? The Panel members’ own views, and those of its respondents, raise several possibilities including closer study of institutional requirements for effective policy reform, and more aggressive development of landscape-scale integrative modeling techniques. Whether such action by ASB would in fact have resulted in significant impacts

on the world must, however, remain hypothetical. Also hypothetical but, in the view of the Panel and many of its respondents, much more likely, is that ASB could have significantly accelerated the advance of modern understanding regarding human-ecosystem dynamics at the forest margin if it had publicly rejected its unfortunate “Alternatives to Slash and Burn” label as soon as it had reached the conclusion that this label identified the wrong problem and pointed to the wrong solution. From our interviews, it is clear that this option was being discussed within ASB from at least the mid-1990s onward. Several experienced participants in the Program who fully endorse (and indeed were responsible for much of) the modern view of ASB’s domain project a “here we go again” attitude when questioned about the name change issue, and seem to view it as a trivial bit of word-smithing. The continuing deep hostility to the name – and to the fact that it is still in use – that the Panel encountered among researchers outside of ASB, especially among friends of the Program, has convinced us that these particular words matter enough to get right. Our formal recommendations are cast accordingly.

Impacts of ASB on Technology and Policy

Having an impact on technology or policy in the ASB domain means, in the view of the Panel, changing the way that people seek to influence the overall system of causes and effects relevant to that domain. As in the case of knowledge impacts, such technology or policy impacts can be “local” – affecting just a few particular people in a few particular places – in which case they are not particularly distinguishable from “outcomes” measured in terms of changes in beliefs of those specific targets. As in the case of knowledge impacts, the more interesting and distinguishing case on which we focus here is when the impacts are regional or even global, affecting how people throughout the world seek to influence the dynamics of the ASB domain.

The Panel finds that ASB results touching on technology and policy correlate well with some but by no means all of the observed changes in management and policy we documented earlier in this section of our Report. On the positive side of the account, the ASB Program was one of the first to systematically demonstrate what is now generally understood to be the error of assuming that increases in small holder productivity would ipso facto reduce rates of deforestation and forest degradation. ASB built on these early insights (which it articulated as “the Pandora’s Box problem”) to lead the way in scientifically characterizing the trade-offs across different stakeholder interests inherent in different land use decisions. The “ASB matrix” created and calibrated by the Program has become widely used and globally accepted as a state of the art scientific framework for supporting decision making about land use alternatives. Many of the Panel’s interviewed respondents view the work underlying the ASB trade-off matrix as the Program’s greatest impact on policy in its domain. The Panel does not disagree with this view, but believes that ASB’s impact may have been at least as large, and as important, in the broader area of helping to “globalize” policy approaches to human-environment dynamics at tropical forest margins. In particular, we find that ASB has almost certainly played a highly influential role in establishing the present view that policy bearing on land use at the forest margin cannot be treated as a predominantly local affair but rather must and can be shaped to reflect global economic and environmental interdependencies.

ASB's impacts are less clear with respect to several other major changes that have affected international approaches to technological innovation and policy making in the Program's domain. For example, although ASB outputs acknowledge what has become generally accepted as the need for engaging an increasing variety of actors in efforts to manage landscape use at the forest margin, the Panel could find little evidence of ASB leadership in this area. Indeed, even today the Program as a whole seems much more deeply and systematically engaged with academics and international organizations than it does with NGOs and civil society.⁶⁶ Another area of significant change in the world's approach to policy in the ASB domain for which ASB does not seem to have played a leading role concerns the growing recognition of the suite of governmental reforms (including the control of corruption) necessary for creating an environment in which market forces and other incentives can realize their potential. The Panel does not argue that ASB should necessarily have played a larger role in bringing about these changes, or that it has not produced some results consistent with the larger trend. Our point is merely that governance reform as it affects the forest margin is not an area in which we have been able to detect a major impact of ASB activities.

Finally, there are several areas in which the Panel finds that ASB has had significant local impacts on technology adoption and policy change, and believes that there is significant potential for these impacts to spread in time across the pan-tropic domain. Here are two examples:

- The introduction of *Arachis pintoi* to arrest pasture degradation in the Amazon had a discernible impact on environment and livelihoods of thousands of farmers. It also shows signs of relatively smooth multiplication as many farmers appear to fine tune practices to suit their specific context and to adopt them at a larger scale with relatively moderate external support to increase awareness, some technical assistance and subsidized planting material. The impact of ASB research in this case is large and likely to grow. Thus, the *Arachis* experience has already multiplied to cover some 80,000 hectares of pastures and 2,000 farmers in Acre, only five years after dissemination started. Its most significant impact, however, is the substantial area of forests, estimated at 2.5 million hectares, that would have been lost in the absence of ASB's research results, as farmers would have abandoned unproductive soils and searched for new lands expanding the agricultural frontier deeper into the forest. Further, looking into the future, the impact of ASB research is likely to extend to large areas of the remaining 20 million hectares of the Amazon's abandoned pastures.
- The ASB supported regulatory reform in Krui West Sumatra and Sumber Jaya, Lampung, Indonesia, had a clear impact on 8,000 families and 40,000 hectares. If this reform had not been adopted, it is likely that violent conflict would have taken place, besides considerable resource degradation and impoverishment of the Krui communities. More importantly, there are some 50 other communities in Indonesia that could benefit from similar regulatory developments. ASB partners are working to secure rights to contested lands in Sumber Jaya to facilitate negotiation for HKM status (community forestry program) in ways that would ensure government-sought environmental services in watersheds and protection of park boundaries while also enabling settlers to manage their coffee systems. Analyses under way show that avoiding eviction and securing rights would result in considerable financial costs and likely violence avoided. At the

more general policy level, ASB partners are working with national and international institutions and advocacy groups in a joint effort to secure greater recognition of customary rights within the State Forest Zone for these and other traditional communities. If further regulatory transformation were to take place, the impact of this initiative would be considerably larger, involving large areas and numbers of people and avoiding an important source of conflict.

Impacts of ASB on Capacity

Having an impact on capacity in the ASB domain means, in the view of the Panel, changing the ability of people to seek new knowledge, institutions and technologies relevant to that domain. As in the case of other impacts, such capacity impacts can be “local” – affecting just a few particular people in a few particular places – in which case they are not clearly distinguishable from “outcomes” measured in terms of changes in the capabilities of those specific targets. As in the case of other impacts, the more interesting and distinguishing case on which we focus here is when the impacts are regional or even global, affecting the capacity of people throughout the world to increase knowledge and technologies relevant to the ASB domain.

The Panel finds that ASB has made substantial contributions to some but not all of the major changes that have occurred over the last decade in the world’s capacity to address questions of sustainable land use at the forest/agriculture margin in the humid tropics (what we have called ‘ASB’s domain’). The Program’s greatest impact on capacity is the least tangible. As demonstrated by the role assigned to ASB in the Millennium Ecosystem Assessment described earlier in this report, the Program has created the world’s pre-eminent system for the comparative scientific investigation of human-environment interactions in its domain. Put somewhat differently, were it not for ASB, a good case can be made that although excellent research and analysis would continue to exist focused on the ASB domain, there would be little or none of the conviction the Panel found in the international community that use-driven research of sustainable land use issues at the forest/agriculture margin in the humid tropics is unusually well conceived and effectively integrated.

Beyond this overall impact on capacity, ASB has almost certainly contributed through its benchmark system of standardized methods to the emergence of today’s vastly improved global capacity to measure changes in land use and their implications at the tropical forest margins. The Panel finds that the Program plays a lesser but nonetheless important role in the world’s maturing ability to explain and predict those changes. ASB is not, for example, a major component of the capacity for understanding land use change now embodied in the Lucc effort of the international global environmental change programs or the network of Ostrom and Moran at CIPEC⁶⁷ working on institutions for common property management in the tropics. ASB’s relative absence from these programs is more surprising given the centrality of interdisciplinary research to their efforts, and the acknowledged role of ASB in promoting interdisciplinary research. That said, the Lucc effort has called upon ASB to complement its core predictive capabilities with ASB’s acknowledged capacity to link those research capabilities to the worlds of decision making and policy.

Turning from global to more local impacts, it is clear that ASB has substantially enhanced and hastened the development of capacity in the NARS and IARCs with which it has closely

worked. A majority of these organizations – from small NARS to large CGIAR Centers – when interviewed by the Panel cited multiple ways in which ASB had improved their capacity to perform problem-driven, interdisciplinary research relevant to the ASB domain. It remains to be seen, however, whether this capacity can be sustained or transferred to other organizations that have not been intimately involved in the evolution of the ASB Program.

The most glaring capacity need in the ASB domain that the Program has failed to meet is the ability to scale up R&D results into major development initiatives. As the Panel understands it, however, this is a task about which CGIAR as an institution has been somewhat ambivalent, with a resulting lack of clarity regarding who has what responsibility for the production of potentially global public goods leaves off, and who for the transformation of that potential into widely diffused change on the ground. The fact remains that the Panel saw in its site visits and was told in interviews about the lack of capacity in ASB to systematically scale up its research findings and innovative technologies into widespread practice. The Program is aware of this shortcoming in overall system capacity, as illustrated by its proposed collaboration in a Rainforest Challenge Program where the capacity of various partners from the conservation and development communities would complement those of ASB. Whether the system of which it is part will cooperate in helping to relieve the shortcoming remains to be seen, and is largely beyond ASB's control.

2.5 Summary findings of the impact assessment

The Review Panel finds that the ASB Systemwide Program has been highly relevant to the CGIAR's core mission and is pursuing work well aligned with the Science Council's recently articulated System Research Priorities for 2005-2015. In so doing, ASB has played a significant role in transforming the way that decision makers think about the factors shaping land use at forest-agriculture interfaces in the humid tropics. It has created the world's pre-eminent system for use-driven, comparative scientific investigation of human-environment interactions at the forest margin across the pan tropic domain.

Relevance of ASB-SWP goals to the CGIAR

Summary: The Review Panel finds that the ASB Systemwide Program has been highly relevant to the CGIAR's core mission and is pursuing work well aligned with the Science Council's recently articulated System Research Priorities for 2005-2015.

The Review Panel finds that the ASB Systemwide Program has been highly relevant to the CGIAR's core mission. In achieving this relevance, the Program has transcended the limiting scope of its initial framing to focus not on "alternatives to slash and burn" but rather on "*factors shaping land use at forest-agriculture interfaces in the humid tropics.*" The Panel has called this reframed focus of the Program the "ASB domain." Within this domain – where more than 1.2 billion rural people live – ASB has evolved a goal to "raise productivity and income of rural households without increasing deforestation or undermining essential environmental services."

The Panel finds that these emergent goals and strategies of the ASB Program are not only important in themselves, but also well aligned with CGIAR's historical mission to "achieve sustainable food security and reduce poverty in developing countries through scientific research and research-related activities, ... increasing income and improving livelihoods,

without harming the environment” (CGIAR Secretariat, 2004, p.3). The Program goals also fit squarely within the research priorities recently announced by the CGIAR Science Council, notably Priority 4a on Integrated land, water and forest management at landscape level, which seeks to promote “improved land use practices (that) contribute to increased and sustained productivity, optimal conservation, reduced conflicts and equitable use of land, water and forest resources in multi-use landscapes” (CGIAR SC, 2005, p. 57).

Uptake of ASB output¹

Summary: The Panel finds that uptake of ASB products by independent publishers and by users of the Program’s world wide web site is substantial and, suitably normalized, on a par with or somewhat greater than levels achieved by other CGIAR units. There exists an excess demand for Program leaders to serve as speakers and as participants in high level international committees. The Program itself embodies a capacity for research and development that is making it an increasingly attractive partner for other institutions. ASB’s own training programs are taken up by relatively fewer trainees than seems to be the case for several other CGIAR Programs, but its Lecture Notes are in high demand by outside institutions and individuals.

1. The Panel finds the *quantity* of uptake of ASB research by independent publishers is substantial. On a budget-normalized basis it is comparable to that of the CGIAR Centers in general, and about what would be expected from a good problem-driven research institute with 20 or so full time and productive research staff. The *quality* of the uptake venues that publish ASB research is relatively strong with respect to the audience of researchers and policy analysts working in the Center of ASB’s domain, but relatively weak with regard to the larger body of workers in development and conservation circles who, in the Panel’s view, could benefit from more exposure to ASB output. In particular, the Panel finds that ASB results have not been taken up by any of the highest impact journals (e.g. *Science*, *Nature*, *Annual Review of Ecology and Evolution*) that could have brought them to the attention of a large and global audience.
2. The Panel finds that the ASB Program has a significant presence on the world wide web. Visits to the ASB web site have been growing recently at more than 30% per year, a figure comparable to that achieved by other CGIAR units. The number of visits to the ASB site is comparable to that achieved by CAPRI, the only other SWP for which we have data. On a budget normalized basis is substantially more heavily visited than are even the most popular Center web sites. Visits to the ASB web site currently result in the uptake (via downloading) of more than 50,000 ASB outputs per year (and perhaps as many as three times that number). These are approximately evenly divided among knowledge results, policy results, and results directed toward capacity building. The median product (e.g. a research paper or lecture note) achieves about 270 downloads – a good number by comparative standards within and beyond the GGIAR.

¹ Recall that we defined “uptake” of ASB results as a positive action of someone outside of ASB that results in the acquisition of ASB output and in exposure to that output by an audience outside of ASB. Impacts are therefore the most objective but least important of all our assessment measures.

3. The Panel finds that other demands for ASB products and expertise are substantial enough to exceed available supply. These demands include requests for printed copies of its outputs and requests for both lectures by ASB scientists and staff and for their participation in a wide range of international studies, reviews and commissions.
4. The Panel finds a mixed record of uptake for ASB's capacity building outputs. The Program's strongest record is at the institutional level, where an ever increasing number of partners are finding it in their interests to join and work with the ASB Consortium. In contrast, at the individual level - though ASB has trained a substantial number of people ranging from farmers to advanced researchers - the numbers trained are not large relative to those achieved by large Center-wide Programs within the CGIAR. That said, the Panel was impressed by the high rate of demand by outside individuals and institutions for ASB's excellent Lecture Notes series.

Outcomes of ASB²

Summary: The Panel finds that ASB results are treated as influential outputs by communities specializing in the ASB domain around the world. Particular recognition has been given to its research results in pan-tropical research methods, soil science, the analysis of benefit trade-offs among alternative land uses, and cross-sectoral policy guidance. In the action realm, ASB is widely acknowledged to have contributed directly to the design of innovative policies, legislation and institutions across its pan-tropic domain. Examples include substantial influence on World Bank forest policy, and regional contributions to the recognition of traditional rights to forest land tenure, reform of trade policies for rubber wood, and simplification of regulations for smallholder forest management. On capacity building, the Panel finds concludes that a substantial and significant outcome of ASB's activities over the last decade has been the creation of an important and at least partially replicable capacity for harnessing research to the task of advancing sustainable development in the ASB domain. This positive assessment notwithstanding, the Panel notes that while ASB is known to exist by some people in working in broader fields of development and conservation, its outputs are not widely cited or utilized there as they could and should be as truly global public goods. Similarly, the kind of capacity that ASB has shown it can produce remains drastically undersupplied across the pan-tropical domain.

The Panel analyzed four sets of outcome indicators that could plausibly be attributed to the uptake of ASB outputs: 1) the citation or utilization of publications by ASB authors in the writings of others relevant to the ASB domain; 2) permanent linkages to the ASB web site by other web sites relevant to the ASB domain; 3) the adoption of ASB technology and policy outputs by users; and 4) the recognition of ASB capacity by others.

² Recall that the Panel treats *outcomes* in this Review as changes in beliefs or behaviors relevant to the ASB domain that are plausible results – at least in part – of the uptake of one or more ASB *outputs*. As such, results that we classify as *outcomes* are more general and more important, but also less quantifiable and less directly attributable to ASB activities, than are results that we classified as *uptake*. On the other hand, *outcome* results remain more quantifiable and more cleanly attributable than the ultimate results we will discuss under *impacts*.

1. *Citation to knowledge outputs:* The Panel finds that ASB results are recognized as influential outputs through citation in the literature by communities specializing in the ASB domain around the world. Within those communities, ASB is seen as a significant source of both science and policy outputs. ASB is known, but less widely cited, by potentially relevant communities working more broadly on issues of tropical forest conservation, swidden agriculture, or institutions for the management of living resources. A detailed analysis of citation patterns shows that the Program achieves a median rate of 1.5 citations per ASB journal article per year for articles published in the “global” literature. This compares favorably with a median rate of 1.3 for all articles published in “multidisciplinary agriculture” journals. Our general findings are also supported by broad but unsystematic searches for use of ASB results in a wide range of published books and reports and from systematic analysis of the extent to which ASB results are treated in the “Gold Standard” publications selected by the Panel as representative of the most important work by others touching on the ASB domain.
2. *Most recognized outcomes:* The specific outcomes for which ASB is most widely “known” - in the sense of providing a scientific base that many other researchers and analysts cite and build on - are its soils, nutrients and carbon work, with special emphasis on its contributions to building and testing pan-tropically methodologies for their measurement. ASB is also widely recognized for its work on trade-offs (the “ASB matrix”) and - as clearly shown by our “Gold Standard” analysis - for having defined the state-of-the-art on research-based cross-sectoral approaches to shaping policy and management in the ASB domain. The Program is also recognized for its argument that the “alternatives” debate must be about trade-offs rather than “silver bullets” and - to a lesser extent - its work on scenarios and negotiation support. On the other hand, the Panel’s analysis suggests that the world of internationally read publications (i.e. of *global* public goods) has of yet given relatively little attention to ASB’s relatively recent outputs on watershed policy reform, its evaluation of ecosystem services, or its work on mechanisms for compensating poor people for sustaining those services. Attention to ASB’s results on particular technology innovations and practices is mixed, with significant international notice given to its work on fires and on *Imperata*, but relatively little to its locally recognized work on rubber or pasture rehabilitation.
3. *Linkages to the ASB Web site:* The Panel finds that securing permanent linkages to the ASB web site by other significant programs active in the ASB domain is a potential outcome in which the Program has had some but - in relative terms - apparently quite limited success. In this sense at least, ASB cannot argue that it is seen as an indispensable resource by most other organizations working in its domain.
4. *Adoption of methods, technologies and policy outputs:* The Panel finds that the Program has been responsible for substantial advances in the use of innovative analytical methods based on a holistic, multidimensional approach to assessing land use options. The most mature of these tools, the “ASB trade-off matrix,” is beginning to be adopted by policy advisors in governments (e.g. Indonesia, Kenya) and leading international institutions (e.g. the World Bank, FAO, UNDP) to plan their activities and to inform the global debate on sustainability issues at the forest-agriculture

margins. The Panel finds that ASB research has led to the design of new technological packages that are integrated with economic, social and environmental analyses of ex-ante impacts to increase their adoption and dissemination. The Panel found evidence that research at the ASB benchmark sites has already begun to influence natural resources management practices in ways that have led not only to income and environmental benefits but also to avoidance of substantial economic and environmental losses, as well as of occurrence of damaging conflict. Examination of the documentary record and its interviews shows that ASB has contributed directly to the design of innovative policies, legislation and institutions across its pan-tropic domain. Examples include work related to the recognition and rationalization of traditional rights to forest land tenure and access and the policy reforms in Thailand, reform of trade and marketing policies for rubber wood in Indonesia, simplification of regulations for smallholder forest management in Brazil and, internationally, the reevaluation and design of the new World Bank forest policy.

5. *Recognition of ASB capacity building by others:* The Panel found that a substantial and significant outcome of ASB's activities over the last decade has been the creation of an important and partially replicable capacity for harnessing research to the task of advancing sustainable development in the ASB domain. In particular, the systematic, pan-tropical approach of ASB to implementing common research protocols across a strategically selected range of "benchmark" sites is cited by many as their "standard" for how productive international collaboration on NRM challenges should be organized. ASB is also widely recognized as establishing a model for integration of natural and social sciences in NRM. Finally, the Panel finds that Program has developed a significant capacity for linking the research and action communities on matters of land use change and management.

These capacity building efforts of ASB, though impressive, are by no means complete or without shortcomings. The Panel finds that the accomplishments noted above notwithstanding, the "benchmark" model has not been widely copied, the integration of natural and social sciences has yet to encompass several key disciplines, and the linkages of the Program with the policy community have been no stronger than the local policy communities themselves. The Panel thus concludes that while ASB has advanced significantly the world's capacity for achieving ASB and CGIAR goals in the Program's domain, that capacity remains spotty and still far from adequate to the challenges of advancing livelihood security, economic growth and environmental conservation at the forest margins of the humid tropics.

Impacts of ASB³

Summary: The ASB Program has played a significant role in transforming the way that decision makers think about the factors shaping land use at forest-agriculture interfaces in the humid tropics.

³ Recall that the Panel treats *impacts* in this Review as changes in the state of the world relevant to the ASB domain that are plausible results – at least in part – of the one or more ASB *outcomes*. As such, results that we classify as *impacts* are those of ultimate importance, but are also less quantifiable and less directly attributable to ASB activities than are results that we classified as *outcomes* or *uptake*.

It has also helped to change the agendas of researchers, policy analysts and entrepreneurs seeking ways to raise productivity and income of rural households without increasing deforestation or undermining essential environmental services. In so doing, ASB has created the world's pre-eminent system for use-driven, comparative scientific investigation of human-environment interactions at the forest margin across the pan tropic domain. Despite relative weaknesses in certain areas of modeling and institutional analysis, the Program has set the standard and established a model for integrating natural and social science approaches in response to complex NRM problems. In both international policy circles and at the benchmark sites across the tropics where ASB has had the resources to bring knowledge into action, the Program has begun to bring about lasting changes in how resources are allocated and how resource users conduct their use of complex landscapes. The Program's greatest shortcoming is that it has been unable to secure or mobilize the resources to extend its results to any but a small fraction of the 1.2 billion across forest margins of the tropics people who are still struggling to mitigate their poverty while conserving the natural resources on which their and others' well being depends.

The Panel adopted a three-pronged approach to its assessment of ultimate impacts. First, it sought to establish how the ASB domain has changed over the last decade without regard to the role of the Program in bringing about those changes. Next it sought to establish where correlations exist between changes being promoted by ASB and changes that have in fact occurred, thus establishing the possibility that ASB has played a role in bringing about the change. Finally, it drew on previous analysis of uptake and outcomes to establish whether a plausible causal connection underlies the observed correlations.

1. *How the ASB domain has changed:* The Panel reviewed documentary evidence and interviewed a wide range of experts to sketch an assessment of how the ASB domain has changed since the early 1990s. Overall, the Panel finds the need for effective intervention in human-environment interactions at the forest margins of the humid tropics has if anything increased over the last decade. Although there are places on the tropical forest margins where human livelihoods have improved and environmental degradation has slowed during that period, such positive trends remain the exception rather than the rule. The general picture remains bleak, with both poverty and deforestation continuing to increase in far too many places throughout the humid tropics.
2. *Impacts on Knowledge:* Many studies and programs have contributed to the changes over the last decade in the world's knowledge of human-environment interactions on the forest margins in the humid tropics. Nonetheless, the Panel finds that ASB research has had a significant impact on contemporary understanding and policy emphasis regarding the promotion of "sustainable agricultural development based on the environmentally sound management of natural resources" across the ASB domain. The Panel finds that ASB is recognized by researchers and institutions working on poverty alleviation and conservation at the tropical forest margin as the world's leader in integrated, interdisciplinary research on the human and environmental consequences of land use choices in that domain. That the Program has achieved this recognition is all the more remarkable given that its initial name and framing can be seen in retrospect as having reified a perniciously simplistic misconceptualization of what are now understood to be the underlying relationships

among human livelihoods, economic growth and resource conservation at the forest / agriculture interface in the humid tropics. To the Program's credit, it relatively quickly realized the shortcomings of its initial framing and redirected itself to play a leading role in articulating the more nuanced modern view its domain that prevails today. That said, the Panel finds that the Program's name not only now fails to convey what it in fact studies, but also presents a substantial barrier to the wider acceptance of the Program and its results. The Panel finds that every major difference we identified between how the world of 1992 and the world of today understands the underlying human-environment interactions at the forest margin in the humid tropics reflects a change that the ASB Program was active in promoting. These include an emphasis on the importance of smallholders' active management of land at the forest margin; the multiple actors involved in land use change at the forest margin; the multiple services provided to those actors by land at the forest margins; and, more generally, the complex dynamism of what we have called the ASB domain. The Panel is reasonably confident that ASB activities are at least in part responsible for bringing about these important changes. It is not that ASB was the first to note or discover most of these novel elements of the modern understanding, but rather that its systematic, science grounded approaches helped to transform existing anecdotal understanding at specific locales into globally accepted scientific knowledge of an entire eco-region.

3. *Impacts on Technology and Policy:* ASB results touching on technology and policy correlate well with some but by no means all of the observed changes in management and policy that have occurred over the last decade. The ASB Program was one of the first to systematically demonstrate what is now generally understood to be the error of assuming that increases in small holder productivity would ipso facto reduce rates of deforestation and forest degradation. ASB built on these early insights to lead the way in scientifically characterizing the trade-offs across different stakeholder interests inherent in different land use decisions. The "ASB matrix" created and calibrated by the Program has become widely used and globally accepted as a state of the art scientific framework for supporting decision making about land use alternatives. More broadly, the ASB helped to "globalize" policy approaches to human-environment dynamics at tropical forest margins, showing that actions can and must be shaped to reflect global economic and environmental interdependencies. The Panel finds that ASB's impacts are less clear with respect to several other major changes that have affected international approaches to technological innovation and policy making in the Program's domain. For example, although ASB outputs acknowledge what has become generally accepted as the need for engaging an increasing variety of actors in efforts to manage landscape use at the forest margin, the Panel could find little evidence of ASB leadership in this area. Also, the ASB does not seem to have played a leading role concerns the growing recognition of the suite of governmental reforms (including the control of corruption) necessary for creating an environment in which market forces and other incentives can realize their potential. Finally, there are several areas in which the Panel finds that ASB has had significant local impacts on technology adoption and policy change, and believes that there is significant potential for these impacts to spread in time across the pan-tropic domain. Two specific examples are the introduction of *Arachis pintoi* to arrest

pasture degradation in the Amazon and the ASB supported regulatory reforms over land rights in Indonesia. The Panel emphasizes, however, that the potential spread of such local innovations is unlikely to be realized unless the Program addresses its current weaknesses with respect to governmental reforms and development partners.

4. *Impacts on Capacity:* The Panel finds that ASB has made substantial contributions to some but not all of the major changes that have occurred over the last decade in the world's capacity to address questions of sustainable land use at the forest/agriculture margin in the humid tropics. The Program's greatest impact on capacity is the least tangible. As demonstrated by the role assigned to ASB in the Millennium Ecosystem Assessment, the Program has created the world's pre-eminent system for the comparative scientific investigation of human-environment interactions in its domain. Beyond this overall impact on capacity, the Panel finds that ASB has almost certainly contributed through its benchmark system of standardized methods to the emergence of today's vastly improved global capacity to measure changes in land use and their implications at the tropical forest margins. The Panel finds that the Program plays a lesser but nonetheless important role in the world's maturing ability to explain and predict those changes. Turning from global to more local impacts, the Panel finds that ASB has substantially enhanced and hastened the development of capacity in the NARS and IARCs with which it has closely worked. It remains to be seen, however, whether this capacity can be sustained or transferred to other organizations that have not been intimately involved in the evolution of the ASB Program. The most glaring capacity need in the ASB domain that the Program has failed to meet is the ability to scale up R&D results into major development initiatives. As the Panel understands it, however, this is a task about which CGIAR as an institution has been somewhat ambivalent, with a resulting lack of clarity regarding who has what responsibility for the production of potentially global public goods leaves off, and who for the transformation of that potential into widely diffused change on the ground. The Panel finds that the Program is aware of this shortcoming in overall system capacity, as illustrated by its proposed collaboration in a Rainforest Challenge Program where the capacity of various partners from the conservation and development communities would complement those of ASB. Whether the system of which it is part will cooperate in helping to relieve the shortcoming remains to be seen, and is largely beyond both ASB's control and this Panel's remit.

3 HOW EFFECTIVE AND EFFICIENT HAS ASB BEEN IN PERFORMING ITS CORE FUNCTIONS?

In this chapter the Panel evaluates how effectively and efficiently the Program's internal management has contributed to the impacts characterized in Chapter 2. In the terms of Table 1-A and Figure 1, this chapter assesses ASB's *goal and priority setting*, its *mobilization of inputs*, its *implementing activities*, and its *outputs*. In each chapter, following the approach outlined in Chapter 1, we trace to the extent possible the four closely interrelated pathways through which ASB research output might have had results in the real world: contributions to knowledge, to technology, to policy and to capacity to produce all of these.

3.1 Goal and priority setting

In Chapter 2 the Panel assessed the goals and strategies of the ASB Program with respect to their relevance and appropriateness for the overall objectives of the CGIAR. We concluded there that "one of the most striking features of ASB has been its own evolving definition of the problem it should be addressing, and thus the goal of its work. Retrospectively at least, the Program has portrayed its own evolution in terms of as a series of hypotheses that were empirically evaluated, found wanting, and replaced by alternatives..." We concluded that the goals emerging from that process were "not only important to the world, but also well aligned with CGIAR's historical mission ... (but also) fit squarely within the research priorities recently announced by the CGIAR Science Council." In this section we turn to an evaluation of mechanisms through which ASB has fostered the evolution of its goals, and has prioritized its efforts for reaching those goals.

Evaluation approach

The Panel rounded its evaluation of ASB's approach to goal and priority setting through examination of relevant CGIAR studies on the challenges of iNRM program planning and evaluation (particularly Sayer and Campbell 2004, Barrett, 2003; TAC 2001).⁶⁸ We then consulted Program documents (especially the minutes of the Global Steering Group), conducted interviews with members of the Global Steering Group, the Global Coordinators Office, and regional and national program leaders. We also benefited from ASB documents surrounding a major strategic planning exercise undertaken by the Program in the 2002-2004 period, which culminated in a two-day "Strategic Planning" dialogue conducted at the ASB's December 2004 Global Steering Group Meeting. One member of the Panel attended that dialogue and interviewed participants in it.⁶⁹

The Panel concluded that the central challenge facing ASB in its priority setting efforts has been to build a balanced strategy that promotes the joint knowledge, action, and capacity activities necessary to attain its goals. This is complicated by the fact that ASB seeks knowledge that is widely accepted as a global public good (i.e. valid and relevant everywhere, or at least across the Program's pan-tropic domain), action (policy and adoption of innovation) that is in large part embedded locally or regionally, and capacity that includes not only the capability of pursuing those global research and local action goals, but also enables crucial linkages of knowledge and action across scales. How effectively and efficiently has the Program met this formidable challenge?

Historical evolution of ASB's mechanisms for goal and priority setting

In evaluating ASB's mechanisms for goal and priority setting, it is important to emphasize that there existed at the time of ASB's inception no guidelines or consensus within the CGIAR on how strategies for NRM research should be designed or activities prioritized. Especially during its first five years of operation, ASB – along with other NRM programs – were essentially forced to invent CGIAR's approach to NRM as they went along. From this perspective, the Panel was not surprised to find that ASB did not start with a self-conscious or effective system for priority setting, but rather evolved such a system in response to the changing challenges and opportunities created by its changing funding structure. The Program was born as an essentially top-down enterprise, with its priorities and even goals substantially influenced by its initial grantor, the Global Environmental Facility (GEF). From the outset, however, with GEF's encouragement, substantial consultations with national and local partners were carried out. The most important of these contributions of these early consultations may well have been seeding what became the Program network infrastructure, providing regional input into the competitive review of proposals from the region to carry out the GEF program and, as the GEF funding came to a close, a greater regional voice in articulating problem and research priorities.

As it emerged from its early GEF-funded period, the ASB could have adopted at least three approaches to strategic planning: i) region-centered, emphasizing integration of knowledge and action at the level of its place-based national and local steering groups; ii) function-centered, emphasizing the professional perspectives of its early working groups on Research, Policy, and Capacity; or iii) theme-centered, emphasizing the disciplinary integration of its emerging working groups on challenges of biodiversity, climate change, etc. In fact, the Panel finds that the Thematic Working Groups emerged as the defacto priority setting mechanism for much of the Program's work. These groups drew members from the national and regional teams, and from people on the policy as well as research side. They gradually superseded both regionally focused and functionally focused (i.e. on knowledge, action and capacity) groups that had early on had a nominal role in ASB's priority setting. One of these Thematic groups, on "Synthesis and Linkages" emerged as the de facto mechanism for discussing and selecting strategic priorities. Its 1999 meeting in Costa Rica in essence became the mid-term strategic review of the Program, and established three principal shifts in orientation that have guided activities through to the present day.⁷⁰ The Synthesis Group has continued to play an important priority setting role under chairmanship of the Global Coordinator, even as the other Thematic groups have withered due to lack of funding. The Program's Global Steering Group has worked closely with the Synthesis Group in performing this function, a collaboration facilitated by the substantial overlap in membership between the two groups.

In the Panel's view, the emergence of ASB's Thematic Working Groups (and later the Synthesis Group) as the de facto priority setting mechanism for the Program by the late 1990s gave it the truly integrative character as a pan-tropical iNRM Program that has been one of its principal distinctions. In particular, we believe that this approach to priority setting helped ASB to transcend the alternative fates of becoming merely a consortium of loosely coupled regional studies or merely a conventional structure of separate research, action, and capacity thrusts. The flip side of this focus on globally relevant research themes

is that the priority setting for the Program under the Synthesis Group / Global Steering Group mechanism could easily under emphasize the local and regional perspectives on needs that are such an important part of effective NRM strategies.

The Program clearly recognized this risk, and in the early years of this decade had instituted procedures designed to assure a continuing voice in priority setting for its national and local collaborators. These amounted to having the Global Coordinator, in both his GC role and his role as Chair of the Synthesis Group, encourage, facilitate and coordinate proposals for problem-driven initiatives grounded in perceptions (and funding opportunities) at the regional and national level, and then presenting these to the Global Steering Group for approval. The GSG functioned less proactively and more to assure that only those regionally driven proposals that were also in line with the global ASB priorities that had originally been formulated by the Thematic Working Groups would be approved as official ASB projects. Given the scarcity of global project funds during this period, this amounted to an ongoing negotiation among regional collaborators, their funders, the GCO and the GSG over the right balance between local/ regional need-driven agendas and global research-driven agendas.

By 2002, it was clear to ASB that though the global/local tension noted above had stimulated some truly creative work at the knowledge/action interface, it also ran the risk of degenerating into parallel, relatively independent agendas that would lose much of what ASB at its best has had to offer. The Program, therefore, instituted a major strategic planning exercise including an online discussion among ASB participants, user needs assessments in several of its collaborating regions, a strategic mapping of impact pathways for its projects and the dialogue workshop at the 2004 GSG meeting noted above. These activities resulted in the production of an ASB Medium Term Plan for 2006-2008. This Plan provides a renewed articulation of the Program's vision, mission, and goals, which the Panel discussed in Chapter 2 of this Report. And it presents for the first time a formal results-driven prioritization of future Program activities.

Analysis

Looking at the Program's first half decade, we find a largely ad-hoc and evolving set of procedures. Despite their somewhat informal character, they proved to be quite effective in launching an exciting new and innovative approach to the production of scientific knowledge grounded in a pan-tropic array of benchmark sites. The informal approach of this period seems to have proved a reasonably efficient means of prioritizing the allocation of resources from the initial "global" GEF grant to ASB. Perhaps even more important, it established a style of collegial decision making that bound together a core group of regional leaders whose mutual regard even today provides much of the "mechanism" for making strategic choices among alternative ASB activities.

As ASB grew from a new program to a maturing and operational one in the late 1990s, however, the Panel finds that the informal priority setting mechanisms that had served it well early on became progressively less suited to the challenges facing the Program. A general agreement on mission and goals was in fact sustained. But tensions about how to achieve those goals began to emerge that existing mechanisms could not effectively handle in at least three areas: i) allocation of effort to create scientific knowledge and technical innovation versus effort to move that knowledge and know-how into practice; ii) effort

devoted to addressing development goals vs. conservation goals; and iii) effort devoted to providing global public goods versus regional and local ones. Such tensions have torn apart other NRM projects with which the Panel members and their interviewees are acquainted. ASB seems to be handling them better than many by acknowledging them, and facing them head-on.

To the Program's credit, beginning early in the present decade, its GCO – with support from the GSG and ICRAF management – played an active role in articulating these tensions, urging ASB participants to discuss them and setting in place a process to design a more formal and appropriate process for the contemporary challenges faced by the Program. The resulting dialogue, which could have led to any number of fissions of the Program, has not yet done so, in large part – in the view of the Panel – because of the legacy of regard and mutual respect among senior Program participants on which we remarked earlier. The new priority setting process that had begun to emerge just as this Review began in late 2004 and is now best reflected in the current Mid-term plan (2006-2008), is as close as this Panel has seen to a text-book approach to goal and priority setting for a distributed, use-driven research program. It is remorselessly impacts-driven but science-based, pays admirable attention to specifying measurable results at each stage of the process reaching from goal setting through activities to impacts, and yet remains open to input from both global and local participants in the Program. If effectively implemented, the emergent ASB approach to priority setting will almost certainly help to resolve the tensions noted above and enhance the impact of ASB on its domain. The question remaining is whether the Program has in place – or can put there – the management structures and resources to make its admirable new priority setting plan a reality.

Conclusions

The Panel finds that one of ASB's greatest accomplishments may well be its success in functioning as a dynamic learning organization. As effectively as any organization we know, it has used systematic reflection on its own research and experience not only to learn better answers to its original questions, but also to learn better questions to ask. This has been enormously important for a program that the history of the 1992 Rio Conference saddled with the overly simplistic and narrow framing "alternatives to slash and burn" – a label that unfortunately has persisted in the Program's name and that continues to distort the broader community's views of its work and accomplishments. To its credit, the Program itself has transcended its name to grow through three major reframings of its goals and associated strategies. In so doing, the Program has become a progressive driving force for articulating the more complex, realistic and integrated view of human-environment interactions at the tropical forest margins that we described in our evaluation of Program impacts. It has also played a central role both within and beyond the CGIAR in shaping contemporary thinking about ecoregional approaches to iNRM.

The Panel finds that the mechanisms employed by ASB in its reflexive approach to goal and strategy (re)definition have been both efficient and equitable. Decisions are made collectively and consensually by a Global Steering Group (GSG) consisting of the leaders of core partner institutions as well as selected representatives from relevant CGIAR institutions (see the discussion on "Governance" later in this Review). ASB is 'problem driven', with problem identification done as a collaborative effort involving participation and consultation

at many levels. The Program has developed and deployed multilayered processes of strategic stakeholder analysis and user needs assessment to support its problem identification efforts. Proposals for new projects or directions resulting from this work may be put forward by partners or the Global Coordinator, giving the Program a capability it has used well to mix global (pan-tropic) and local perspectives in setting its agenda. New proposals are vigorously debated in terms of their scientific and practical merits in small working groups or workshops, often revised to reflect those debates, and then brought forward to the annual meeting of the GSG for formal, consensual approval. Virtually every individual we interviewed who had been involved in this process praised its openness, transparency and low transaction costs. These admirable characteristics are achieved less through formal rules and procedures than through the palpable mutual respect and sense of mission shared among the participants.

These strengths notwithstanding, the informal priority setting system that served the Program well through its first five years has been increasingly unable to handle emergent tensions in three areas: i) allocation of effort to create scientific knowledge and technical innovation versus effort to move that knowledge and know-how into practice; ii) effort devoted to addressing development goals vs. conservation goals; and iii) effort devoted to providing global public goods versus regional and local ones. The Program has, with its new Mid Term Plan, put in place new “impact-based” planning procedures that are very much what modern results-based management approaches would recommend. Whether the Program has in place – or can put there – the management structures and resources to make its admirable new priority setting plan a reality remains to be seen.

3.2 Inputs

In this section, the Panel evaluates the effectiveness and efficiency with which the Program has mobilized in pursuit of its objectives the inputs of funding and people.

Funding

The basic pattern of funding for the ASB Program can be summarized as follows (see Table 3-A).⁷¹ The total annual budget for the Program, averaged over its lifetime, was about US\$ 6.4 Million.⁷² Although annual funding over this period saw periods of both increase and decline, the overall trend was positive, with the annual budget in the Program’s most recent five years about 50% higher (in real terms) than in its first five years.

Over the lifetime of ASB, on average about 30% of its income was received by the global program, about 60% by its regional and national partners, and about 10% by its various associated activities. About 40% of the funds coming in through the global program were passed directly to the regional/national and associated programs, with the result that 20% of total expenditures were targeted at global activities, and 80% at partner activities. These numbers also changed through time. Over the first five years of the Program, the ratio of global to partner expenditures was about 1:2, whereas over the last five years its leverage increased substantially to a level of about 1:9.

Sources of funding have also changed through time, primarily in the direction of greater funding diversity, but also smaller individual grant sizes and shorter grant durations.

Initially most of the support came through the Global Environment Facility (GEF), whereas at present most of the support comes through grants targeted on specific regional and national efforts. More generally, for core program funding, the average number of grants active in a given year doubled between the first and last five years of the Program, whereas the size of the largest grants has generally declined.⁷³

Effectiveness

Virtually any program working on problems as serious and wide-spread as ASB does can be safely assumed to be short on resources to accomplish its goals.⁷⁴ In order to interpret the relative effectiveness of ASB's efforts to secure adequate financing, the Panel would have liked to carry out comparisons with other appropriate CGIAR programs and Centers. Unfortunately, comparable data that would have supported such analysis proved surprisingly difficult to assemble with the result that under our constraint of time we were forced to give up and focus on the ASB data alone. Acknowledging the limited perspective that the resulting lack of comparative data imposed on us, the Panel interpreted the ASB data as indicating that the Program has evolved from a modest sized program primarily funded to conduct a few big global activities toward a larger program primarily funded to conduct a greater number of smaller regionally focused activities. In principle, this is not necessarily either surprising or distressing: a maturing program might well intentionally shift the balance of its expenditures from core tasks aimed at global public goods production toward regional tasks aimed at applying those global public goods in specific situations. In practice, however, the Panel sees several problems in the funding trends that ASB has experienced.

The long term increase in total funding of the Program is, of course, a good sign reflecting the value that ASB is seen as delivering to an increasing number and variety of donors. Equally positive is the evidence that ASB has been increasingly effective in leveraging relatively small amounts of core global funding to help support regional research and application efforts. The strong support that ASB has secured from ICRAF as its host Center should be noted, involving both support of ICRAF scientists to work on ASB projects and direct support of ASB's Global Coordination Office.⁷⁵

That said, the funding patterns summarized above also show that while an increasing number of donors are willing to make investments in specific projects and places that reap marginal benefits from ASB's decade of work as a Systemwide Program (SWP), donors have been decreasingly willing to support the global activities that have allowed ASB to produce, and to become, a global public good. In fact, given the central role that the global coordinating activities have and continue to play in creating ASB's impacts (see Chapters 2, 4) the decline in core support for such activities has now progressed to such an extent that some have called into question the continuing viability of ASB as a global Program. The Panel observed clear consequences of this trend in the multiple opportunities for enhancing ASB impact that have been allowed to slip by due to lack of CGO staff, in the relative absence in recent years of the kind of innovative multidisciplinary work that took place in the centrally supported Thematic Working Groups, and in the setback felt by virtually all Program participants we interviewed caused by the cancellation (for financial reasons) of the annual GSG meeting in 2002.

At the national and regional level, the overall increase in funding has generally been tied to specific projects. Infrastructure for program development, capacity building and implementation of results has generally seen less support in recent years than earlier in the Program's history. ASB's recent on-line dialogue revealed that regional collaborators feel most intensely the shortfall in capacity development and training that has resulted from these funding shortfalls. The Panel, through its field trips and interviews, observed repeatedly the consequences of this funding shortfall that left underdeveloped the job of connecting ASB output to field users at the farm and policy level. Finally, the increased proportion of funding flowing through the national levels (often in narrowly defined projects) has meant less system-wide flexibility in moving funds from one activity to another (in different geographic regions) to ensure the continuity of an activity at a basic (maintenance) level when it runs out of funding. Thus, the shift in funding from global to regional and national levels seems to be decreasing the capacity of the consortium to ensure the continuity in key activities at the national levels.

In summary, the Panel finds several specific activities with which ASB has shown that it can produce particularly valuable outputs but cannot adequately disseminate or apply those outputs due to funding constraints. The most important of these are global coordination and governance; regional and national facilitation; capacity building to use ASB outputs (e.g. policy use of the ASB matrix); synthesis of findings (e.g. completing the tropical forest margins assessment); initiating new science (e.g. developing landscape modeling initiatives, pursuing scenario development work); and – above all – carrying technology and policy findings forward into application.

The Panel concludes that while ASB as a Program (with special assistance from its host Center ICRAF) has been gratifyingly effective in raising an increasing level of financial resources, that these resources have been both inadequate in total amount and imbalanced in allocation across tasks to enable the Program to realize its full potential. We address the implications of its current funding situation for the future of ASB, in Chapter 5.

Efficiency

What would be an "efficient" approach to fundraising? In the Panel's view such an approach would have a reasonable ratio of time spent in fundraising per dollar successfully raised; would target fundraising on high priority work rather than chasing money regardless of task; and would increase the overall capacity of the program to raise additional funds in the future.

Once again, the absence of comparative data from elsewhere in CGIAR or Bank-funded research programs makes it difficult to interpret such data as are available on the efficiency of ASB operations. Nonetheless, the pattern of funding summarized at the beginning of this section does not bode well for an evaluation of ASB's fundraising efficiency. Any organization that is increasingly dependant on external funding that comes in small packets for short duration (e.g. < 2 years) projects faces increasing transaction costs in order to ensure continuity in the funding of the key activities and operations. When grant opportunities are increasingly for specific, narrowly defined projects, grant preparation time increases accordingly as the opportunities for building one grant on another decline.

In fact, an increasing fraction of the grant opportunities pursued by ASB in recent years have been for amounts in the US\$ 50-100K range. Since ASB's success rate in grant applications has oscillated at around 30% in recent years (with high variance), this suggests that the Program would have to put out an inordinate number of grant applications per year to meet its budget through external sources (400 proposals to meet its full budget; 80 proposals for just its global activities budget).⁷⁶ This would clearly not be a sustainable – much less an efficient – use of time for a program such as ASB with only a couple of FTEs of full time employees.

Interestingly, however, the greatest frustration with inefficiencies in fundraising expressed to the Panel by ASB leaders (global, regional and national) did not focus on the small size of most available awards or even the Program's success rate. Rather, these leaders identified the overly bureaucratic or incompetent or unprofessional conduct of some staff in some funding agencies as the cause of their greatest waste of time and energy. The ASB leaders were quick to point out that certain funding agencies were a joy to work with: knowledgeable, committed, engaged, and helpful in writing good proposals. Others, however, were seen as more concerned with form than substance, as changing rules in mid-proposal, as making promises on which they didn't deliver, and so on. In the Panel's view, these are not complaints unique to ASB or its substantive area of work. And some of the worst offenders identified by the ASB scientists are widely acknowledged by broader research communities we know as beyond the pale in allowing their own internal organizational politics to stand in the way of good research and policy programs. There is not much that ASB alone can do to mitigate such inefficiencies, except to develop a successful enough funding program that the most wasteful sources of support can simply be ignored. The Panel, therefore, reports these findings not so much for the benefit of ASB, as to raise for consideration of the CGIAR more broadly whether it might want to consider whether some potential sources of support are just not worth the trouble, and ought to be publicly identified as such.

An additional issue regarding fundraising efficiency that arose in the Panel's interviews concerned the competition among CGIAR Centers, Programs and partners for many of the same grant dollars. This was seen to be a big problem by some that we interviewed, and less of one by others. There was general agreement that the incentive structures and evaluation procedures in place within the CGIAR were at most neutral to inter-Center collaboration and in many ways hostile to it. The results were seen to include both lost opportunities and unhelpful tensions due to perceived or actual competition. Virtually all who we interviewed agreed that these collaboration challenges were neither unique to ASB nor something that ASB on its own could do much about. The SC, however, could do something about rationalizing incentives for collaboration, and should.

In the realm of more practical approaches to its fundraising challenge, ASB has recently developed a strategy that seems to the Panel as a reasonable way to keep it from spending increasingly large fractions of its principals' time on an increasingly large number of small grant applications.⁷⁷ The clearest indicator of this is that the ASB Global Coordinator, though engaged in much of the Program's proposal writing, has spent only between 10 and 20% of his time on fundraising over the last several years.⁷⁸ Perhaps half of this has been spent in support of grants by regional and national participants.⁷⁹ In addition, ASB has organized

several training courses aimed at improving fundraising skills of regional and national participants.⁸⁰ Finally, the Global Coordination Office has recently worked with the Global Steering Group and ICRAF senior leadership to design a fundraising strategy that targets scarce human and time resources on three priority areas: 1) leading fundraising for the ASB Global Coordination Office; 2) supporting ASB regional and national partners' fundraising activities; and 3) collaborating with ICRAF's Director of Strategic Initiatives, other CGIAR Centers, and outside organizations in developing a 'mega initiative' such as the 'Rainforest Challenge.' This strategy seems to the Panel to represent, in general, a reasonable way to promote efficient allocation of resources in support of fundraising. It does not, of course, guarantee that an efficient strategy will also be effective in raising the amount of funding support that a viable ASB Program would need.

People

In the Panel's view, an *effective* approach for securing people to provide inputs to the ASB Program would be one that enlisted and retained not only individuals who are highly qualified for the various program tasks of leadership, management, research and policy outreach, but also the appropriate mix of individuals to achieve program objectives. An *efficient* approach to mobilizing people would be a program that made good use of their time, indicated by their willingness to contribute to the ASB beyond what would be justified by their official responsibilities or financial compensation. In the paragraphs that follow, we review the admittedly idiosyncratic evidence we were able to assemble from ASB records and our own interviews to illuminate these criteria.

Individual quality

The Panel examined evidence for the quality of people recruited to the ASB Program in several categories, characterized below. The individuals in each of these groups, and their terms and times of affiliation with the Program, are described in support materials prepared for the Panel by the GCO.⁸¹

Global Steering Group Chair: The individual in this position is charged by the Program governance document (see Chapter 4) with, among other things, ensuring that ASB is well positioned within CGIAR and the broader environment of emerging opportunities and challenges. Interviews conducted by the Panel suggest that an important additional role is exerting leadership in crafting and publicizing a broad vision for the Program. How well has ASB done in recruiting distinguished leaders in its domain to this position? The Panel finds that it would be difficult to imagine a more appropriately distinguished group. Three individuals have chaired the GSG since the Program's inception. Pedro Sanchez (Chair 1991-1999) was DG of ICRAF at the time he helped to initiate ASB and went on to become Director of Tropical Agriculture at Columbia University's Earth Institute, and to win both the MacArthur Prize and World Food Prize. Anne-Marie Izac (Chair 2000-2003) is a world recognized scholar in environmental economics and natural resource management who served as Director of Research for ICRAF and CIRAD. Bruce Campbell (Chair, 2004-present) has directed the Forests and Livelihoods Program at CIFOR, and is author or co-author of various books (including "The science of sustainable development") and numerous technical papers.

Global Coordinator: The individual in this position is charged by the Program governance document (see Chapter 4) with leading and managing the ASB, including priority setting, fundraising and the planning of systemwide activities. Three individuals have served in this role for more than a year since the Program's inception. The Panel gathered data only on the most recent, T. Tomich (2000-present). We evaluate the performance of this position and the CGO more generally in Chapter 4. Here it should suffice to say that Tomich received wide and virtually unreserved praise from both ASB participants and outside experts we interviewed for his publication record, his management of the ASB and, particularly, his leadership in bringing about the skillful integration of natural and social sciences in the Program.

Thematic working Group leaders (1994-1998): As noted in our earlier discussion of "Goals and Priorities," the 7 individuals who served as Thematic Working Group leaders in the early years of ASB also served as its de facto committee for setting scientific research priorities. This is, therefore, a key subset of the Program's leadership. Our analysis shows six of the seven to be well published authors with international reputations well beyond ASB. Our interviews identified five of the seven as major contributors to their fields.

Regional and National Leaders: The emergence of what ASB calls Program "champions" at the regional and, especially, national level has proven an essential component of the Program's strategy for linking global research to local action. The champions serve key roles in linking ASB to local research and policy institutions, securing cooperation, and bridging the research and policy communities. The Panel met and interviewed half a dozen of these "champions" and discussed the role of others through interviews. The striking feature that stands out of these encounters is the deep belief of these "champions" in the potential of the ASB Program and their willingness to work to make it succeed, far beyond any level of commitment that would be required by their institutional or financial connections with the Program.⁸² The Panel had no objective criteria by which to judge the consequences of this commitment. But the commitment itself is something that many program leaders would give a great deal to secure.

Scientists working on ASB projects: Our analysis of publication uptake and outcome in Chapter 2 showed that, taken as a group, the scientists who have regularly collaborated with ASB are an effective group of scholars with publication and citation rates on par with or better than those of their peers working in similar areas. Moreover, ASB has shown an ability to engage at least transiently the very top scholars in the world when events push it into new disciplines.⁸³ The budget analysis presented in the previous section shows that the motivation for this collaboration cannot be primarily financial. Our interviews confirm the alternative explanation that might have been expected: ASB provides an collaborative environment for scholars working in or adjacent to its domain that is attractive for reasons of collegial engagement, intellectual excitement and the opportunity to do research in a context that matters for change on the ground. This is not an inevitable condition for an international program, and ASB should count its creation as a significant and valuable accomplishment.

The mix of individuals

An effective and efficient approach to the mobilization of human resources would need to secure not only the participation of quality individuals, but also a mix of people appropriate for the mission of the program. The Panel analyzed the mix of ASB participants from the perspective of disciplines, gender, and geography.

On the disciplinary dimension, a central element of ASB's strategy has been to integrate natural and social science perspectives in pursuit of its goals. There is no reference standard defining the most effective ratio of participants from these two tribes of the research community for programs such as ASB's. The Panel did, however, hear from many ASB participants it interviewed that one of the primary benefits they had drawn from their association with the Program was the opportunity to mix with intelligent and engaged members of the "other" tribe. In fact, across a wide range of its activities about a quarter (range: a fifth to a third) of the scientists ASB engaged came from social science backgrounds.⁸⁴ We could not locate comparable data from other CGIAR programs or Centers, but suspect that this makes ASB one of the most disciplinarily "balanced" activities in the CGIAR family.

On the gender dimension of program mix, ASB reflects general trends in having relatively excellent representation of women at the staff level (most of the professionals in the GCO), reasonable representation at the researcher level (20-30% of the authors in major book projects), and poor representation at the level of senior management (one of three Chairs of the GSG; one of nine regional/national leaders). Again, the Panel could not locate comparable data for other CGIAR programs. Nonetheless, we do note that the CGIAR Gender and Diversity Program (G&D) selected the ASB GCO and GSG to participate in a pilot training program for "high performance" teams, and the ASB GCO as a positive example for a video on gender balance. The Panel thus tentatively concludes that ASB is doing at least relatively well on gender mix but, as virtually everywhere, has plenty of room to improve.

Finally, the Panel evaluated ASB's performance in creating a Program with an appropriate balance of participants from different areas around the world, with special attention to north-south balance. As might be expected (or, indeed, demanded) from a program focused on the pan-tropic domain, ASB has done well at engaging researchers from the South. For most of its recent major publications, 50-60% of the authors have been from the South. The GSG has perhaps two-thirds of its present membership from the South, reflecting the completely south-dominated composition of the national leaders group. Again, it is only at the highest management levels (regional directors, Global Coordinator) that the geographic representation tends to look predominantly northern.

Conclusion

The Panel finds that the ASB consortium seems to have been able to gather a team of excellent scientists at all levels, well mixed with regard to discipline, gender and geographic origin. It has also offered sufficient value to have been able to retain the interests and engagement of these individuals, even when financial and institutional ties no longer bound them to the Program. Participants cite the intellectual opportunities and excitement provided by ASB as major factors in their decisions to engage and remain engaged, though

they are not insensitive to the potential career benefits of belonging to ASB's extended network. The global and regional coordinators have played important roles in keeping this team together and maintaining standards of excellence. Above all, however, participants – especially those who have been with the program through a substantial part of its history – indicate that a loyalty and commitment to one another is as a prime reason that they stay engaged.

The extended ASB team is a remarkable achievement, particularly in view of the serious funding constraints facing the Program, especially at the national coordination level. Nevertheless, the maintenance of the team cannot be taken for granted, especially as the “founders” move toward other careers or retirement. Steps will almost certainly need to be taken to ensure the continuity in staff excellence, in particular at the national levels. This may partly be addressed through ensuring continuity in the funding of ASB projects and global and regional coordination activities. It may partly require grooming a second (or next) generation of highly qualified scientists and science leaders at the national level.

3.3 Activities

This section evaluates the effectiveness and efficiency with which ASB has implemented specific activities to achieve its goals. There are, of course, many such activities listed in detail in ASB's various progress reports and self assessments. In an effort to maximize incrementally the value of the present Review, the Panel chose not to catalogue those activities but rather to focus on what we judge to be the principle strategic challenges facing ASB as an organization across its knowledge, action, and capacity-oriented activities: i) the production of problem driven knowledge as a global public good; ii) integration of research tools and perspectives across disciplines, institutions and scales; iii) synthesis of the resulting knowledge production; iv) communicating results to decision makers; and v) raising capacity for problem-driven research in the ASB domain. We discuss the activities ASB has mounted to meet these challenges in successive sections below.

Problem-driven production of global public goods

It is by now widely accepted that effective and efficient approaches to knowledge and technology production for NRM need to work with a problem-driven focus in which ultimate users of knowledge and know-how are engaged in defining both questions and modes of production and validation. This is hard enough, as evidenced by the halting progress in producing useful and used NRM research worldwide. Even more difficult, however, is the challenge facing ASB and other CGIAR institutions: the conduct of problem-driven NRM research that is both useful to local decision makers and also transcends the particularities of single sites and case studies to produce the global public good of generalizable knowledge.⁸⁵

ASB's most important strategic response to this challenge, in the view of the Panel, has been its adoption from the outset of the Program of a “benchmark site” approach to organize its research and other knowledge production efforts.⁸⁶ Benchmark sites were established by ASB in the western Amazon of Brazil and Peru, the Congo Basin forest of Cameroon, the island of Sumatra in Indonesia, the northern mountains of Thailand, and the island of Mindanao in the Philippines. These sites are areas (roughly 10^2 - 10^3 km²) in which the

Program has focused its long-term study and engagement by ASB partners with households, communities and policymakers at various levels. Independent research at each of these sites would have been valuable, but in the end could only have added incrementally to the mass of non-comparable NRM case studies that have accumulated around the world over the last half century. What has made ASB, in the Panel's view, unusually effective as a research program is that it insisted from the beginning on developing standardized methods and research questions that were employed at all sites, thereby generating data and understanding that could be compared across them. As a primary means of accomplishing this, ASB formed early in the Program "Thematic Working Groups" (see below) that brought together key researchers from each benchmark site as well as outside leaders to collaborate in the design and execution of the standardized research protocols. As already documented in Chapter 2, the result is widely recognized as constituting one of the world's preeminent pan-tropical research systems for producing generalizable understanding of human-environment interaction at the forest margin.

If ASB had focused only on standardizing research methods across its individual local benchmark sites, the knowledge it produced would have been valuable but of limited relevance to the larger, multi-scale processes of planning and decision making that shape NRM in the humid tropics. ASB's second major design decision addressed this dilemma by embedding its local benchmark sites in an organizational structure employing not only local researchers but also national and regional program leaders plus a Global Steering Group. It used this structure to develop dialogues and consultations with relevant decision makers and policy advisors at each of these organizational levels – household to region to global – in order to assure that the questions it was asking at the benchmark sites truly reflected the needs of people doing development and conservation work on the ground. The Panel could not collect systematic data on whether these dialogues were effective at local scale, though the evidence from our limited site visits is positive. What is clear, however, is that the national and regional dialogues led to a consensus on key objectives of land use decision making held by various stakeholders across the pan-tropic domain. These objectives, suitably generalized, became the "columns" of the ASB Matrix, an original analytical framework created by the Program to facilitate analysis of trade-offs involved in various uses of land at the forest margin. As documented in the impact assessment of Chapter 2, the problem-driven research activities conducted to structure and provide comparable values for the Matrix across the pan-tropic domain resulted in some of the Program's most significant and widely recognized impacts on NRM at the national level and above. The style of problem-driven global public good production set by the benchmark-based creation of the ASB Matrix was used as the Program developed to create a range of additional models and methods for supporting NRM characterization and diagnosis. Based on the uptake and outcomes resulting from this work that the Panel documented in Chapter 2, the ASB approach is clearly a replicable one.

The greatest source of difficulty observed by the Panel in ASB's efforts to target its activities so as to link decision makers' needs to the production of generalizable knowledge concerns the choice of which decision makers to target. How this choice is made confronts the Program at all levels of its operation, and incites an unusual degree of disagreement among its members with the only common feature being an agreement that resource constraints mean that choices must be made. For example, some ASB participants believe that more

interaction with international conventions and assessments (such as the MA) would be a good idea; others disagree. Some think that time spent with most national forestry and agriculture ministries is a waste of time because real power lies elsewhere, while others argue strongly that these ministries cannot be left out of ASB's efforts to ground its work in legitimate decision making structures.⁸⁷ As far as the Panel could discover from its interviews and examination of GSG meeting documents, this issue of which decision makers to engage remains unresolved for ASB. What is very much to the Program's credit, however, is that it has raised the issue and is conducting structured activities such as its on-line dialogue to explore its options and their implications.

Integration of activities across disciplines and institutions

A second major challenge facing ASB in organizing its activities has been to integrate perspectives from the multiple disciplines and institutions relevant to NRM at the tropical forest margins. Far too much research and technology development work underway today fails to achieve such integration and thus provides only limited perspectives on the complex challenges of NRM in the humid tropics. ASB – though originating in disciplines and institutions focused primarily on soil science – adopted early on a multidisciplinary approach to its research. As means for advancing this approach, it concluded that “clear problem definition derived from users' needs is key to disciplinary (and) functional (i.e. institutional)... integration.”⁸⁸

The logic of this conclusion, as explained to the Panel by ASB researchers, was that the shared problem definition allowed individual researchers to sort out what it was that they could contribute to a joint effort, rather than feeling obliged or encouraged to pitch their own perspectives as uniquely relevant to the problem at hand. Based on our own interviews and on evidence documented in the Program's own on line strategic planning dialogue, the Panel found that the Program was frequently successful in developing such a shared problem definition, especially when Program leaders with good connections to field users and national policy officials emphasized the importance of such development. We also share the view of a substantial majority of ASB participants that the Program's success in following up on integrative leadership can be attributed in large part to the Program's decision, noted earlier, to develop thematic (i.e. problem driven) working groups as a primary means of defining and implementing research priorities. Combined with a commitment to joint field visits of team members to the benchmark sites, these working groups proved to be powerful mechanisms for integrating multiple disciplinary and institutional perspectives. Later in the Program's history, this early integrating role of the Thematic Working Groups was effectively complemented by an emerging program of work in integrated modeling – the classic means of achieving disciplinary integration in other NRM research.

ASB's challenge of integration has been further heightened by the fact that its research has been conducted by scientists based in multiple institutions, with other jobs to do. That such inter-institutional collaboration has occurred is clear from the interviews conducted by the Panel, and by the multi-institutional authorship of the outputs the Program has produced (see below). How has it been created and sustained? Clearly, leadership at the CGIAR Centers level of the sort that helped to initiate ASB as a systemwide program is part of the answer. So is leadership from certain NARs and other regional collaborators. And the funding flows documented earlier in this chapter have contributed to institutional

integration, especially in the early years of the Program. In the view of the Panel, however, neither leadership nor funding fully explains the observed patterns of integration.⁸⁹ We – and several of the ASB participants we interviewed – are left with the somewhat unsatisfactory conclusion that a good deal of the clear success of ASB in achieving institutional integration rests on the personal commitment of key researchers in the ASB consortium to squeezing time for the Program out of already busy lives. This is gratifying testimony to the value ASB provides those researchers. It is not obviously a sound foundation on which to rest the future of a system-wide program – a fact that is widely recognized among ASB program participants.⁹⁰

Synthesis of findings

A third major challenge facing ASB in organizing its activities has been to synthesize the results of its research to produce a synoptic understanding of the driving forces, trade-offs, and appropriate responses shaping NRM in its domain. The Panel lists this as a principal challenge because of the frequency with which it has been observed in other programs – including some of the CGIAR – that a superb body of research is reported only piecemeal or is synthesized only in the grey literature, thereby radically limiting its impact as a potential global public good.

ASB has in fact organized a substantial set of activities to synthesize its research results. Some of these are just beginning to appear in print, and thus do not show up in the documentation of impact we reported in Chapter 2. Nonetheless, based on our own reading of the material and the reaction of others we interviewed, we find that the Program has been extraordinarily effective in its synthesis work. A few of the most notable examples, emphasizing recent work that the Panel suspects will register a substantial impact in future years, may be summarized as follows:

- **Global synthesis volume** Slash and Burn: The Search for Alternatives edited by Cheryl A. Palm, Stephen A. Vosti, Pedro A. Sanchez, and Polly J. Ericksen. (in press, expected September 2005). This book is a synthesis of the first decade of ASB's work, written by a team of 80 or so soil scientists, economists, ecologists, anthropologists and foresters from 26 nationalities. In his forward to the book, Jeffrey Sachs – Director of the UN Millennium Project and Special Advisory to UN Secretary General Kofi Annan – writes “This remarkable volume addresses the sustainable management of the tropical forests with unstinting sophistication, moving the analysis beyond clichés to the true complexities of the challenge... (T)his book is a landmark on the path to sustainable development.” Based on its reading, the Panel agrees.
- **Synthesis of ASB work on environmental services:** Environmental Services and Land Use Change: Bridging the Gap between Policy and Research in Southeast Asia edited by Thomas P. Tomich, Meine van Noordwijk, and David E. Thomas. (Special issue of Agriculture Ecosystems and Environment (Vol. 104/1, September 2004). Environmental services is one of the hottest areas of contemporary NRM policy. Most published material, however, consists of either theory without evidence, or single case evidence without context. This volume reports empirical work on three specific environmental services and their degradation within the context of Southeast Asia: smoke pollution, degradation of biodiversity functions, and degradation of watershed functions. It brings a multidisciplinary collaboration aimed to bridge gaps within science, probing for answers about these issues – and solutions for their management. Its synthesis paper, in

the view of the Panel, is likely to become a classic reference charting the course for policy relevant research on environmental services in a development context.

- **Tropical forest margins assessment:** The ongoing Millennium Ecosystem Assessment (MA) is the single highest profile international effort to chart the state and trends of the natural resource base on which humanity depends for its existence. On the basis of its accumulated record of research, ASB was asked by the MA to lead the assessment sub-report on “Forest and Agroecosystem Trade-offs in the Humid Tropics.” This is an evolving document already in wide circulation and receiving positive reviews from the Panel and all outside observers that we interviewed.⁹¹
- Among the older synthesis documents produced by the Program, the reports of its Thematic Working Groups have long been available on the ASB web site and, as documented in Chapter 2, have been frequently downloaded.

Communicating results to decision makers

ASB – like other CGIAR efforts – is at its heart a research program, and thus faces a special challenge in communicating its results beyond its peer group of other scholars and into relevant decision making and policy communities. Part of that communication comes as a natural by-product of the broadcast dissemination of output described in Chapter 2. Beyond this, however, comes the question of conducting activities that target communication of results to particular decision makers.

The question of which decision makers to target has already been discussed earlier in this chapter, and is clearly one that ASB has not entirely resolved. The Program does, however, carry out a number of activities with the objective of enhancing communication with selected segments of relevant decision making communities. These have included the creation and dissemination of the ASB *Policy Briefs* and ASB *Voices* document series, focused input to international policy arenas, occasional press releases on hot topics (e.g. smoke pollution from forest burning in Asia), and supporting various forms of South-South outreach. Specific outputs resulting from these activities are characterized in Section 4 of this Chapter; impacts are assessed in Chapter 2.

More generally, the Panel finds that the single most effective communication link that ASB has with decision makers almost certainly stems from the underlying benchmark site structure of the Program discussed above. Each of these sites has clearly provided the Program with opportunities, which it has aggressively exploited, to work with households and consult with local and national policymakers. Extended social networks have developed through these exchanges that substantially increase the number of decision makers knowing about the substance of ASB initiatives. The personal networks of individual ASB participants figure strongly in these broader program networks. Most notable in this regard are those of the Program’s national/regional leaders and other “champions,” though the substantial fraction of ASB researchers who appear to be deeply committed to participatory research also contribute.

The effectiveness and efficiency of these networks is difficult to evaluate. In Chapter 2 we presented what evidence we could assemble on the impacts that they have helped to promote. We noted there and confirm here that in the small sample of national and regional decision makers interviewed by the Panel, there was substantial variance in their awareness

of ASB outputs – some were intimately familiar, others were not. For some of those who were not, one of the reasons was clearly shown through our interviews to be a lack of local ASB program staff who could take the lead in appropriately packaging and presenting briefings as the particular individuals holding key policy slots change. This difficulty could almost certainly be mitigated with modest infusions of resources to the national and regional level coordinators of the ASB Program.

Significantly, however, for some of those decision makers to whom the phrase “ASB” meant little, further questioning by the Panel revealed that they were very much aware of specific results that ASB had helped to bring about, but that they associated these outputs with ASB partner institutions or “champion” individuals rather than ASB itself. ASB documents and our interviews with its leadership make it clear that the Program is aware of these difficulties, but also that it is loath to push its claim for due credit. ASB’s view – a view with which the Panel generally concurs – is that there are many circumstances in which it can reach certain decision makers more effectively by letting or encouraging other programs and individuals to take credit for the work. The resulting challenge for this Review, and for the CGIAR more generally, is not to let the apparent lack of formal awareness about “ASB” resulting from this sensible strategy unduly undermine our evaluation of the Program’s effectiveness.

Raising capacity for problem-driven research in the ASB domain

Most of ASB’s partners are in developing countries – where lack of access to information, technical expertise, and other resources seriously impairs their ability to research and develop natural resource management options. In both ASB documentation and the Panel’s interviews, local and national partners put support for institutional strengthening as their top priority from ASB. ASB has responded with a range of activities targeted at individuals, groups and institutions that have helped to support strategic training and capacity-building. We summarize what we found to be the most significant of those activities here, while reserving a tabulation of their specific outputs for Section 4 of this chapter. The resulting impact on capacity has already been documented in Chapter 2, and thus serves as input to the evaluation of effectiveness and efficiency presented here.

The Panel finds that ASB training activities were primarily aimed at strengthening the capacity in techniques for integrated natural resource assessment, research, and management, e.g. assessment of below- and above-ground biodiversity; agronomic sustainability; analytical tools for social, economic, and policy analysis; and other indicators for integrated assessment of natural resource issues. An “ASB Lecture Note” series has been prepared covering many of these topics with a set of projection transparencies and teaching notes. (Recall that in Chapter 2 we found that these Notes have an exceptionally high uptake rate from the ASB web site.)

ASB also worked to enhance and broaden the participation in international efforts relevant to the ASB domain by promoting roles for developing country scientists, e.g. as co-authors in global efforts like the Millennium Ecosystem Assessment, and facilitated their collaboration with leading scientists in relevant fields. The Panel finds that this helped to build individual and country capacity for integrated natural resource management and ecosystem assessment at levels from the local to the global, thus supporting a stronger scientific foundation for

decision-making in the tropics. ASB has also supported young researchers, especially from developing countries, to become the next generation of development and research leaders across the tropics. This included joint work with interns, research associates, junior professional officers, postdoctoral fellows, universities, etc.

Activities of ASB targeted on institutional strengthening included development of appropriate training materials derived from ASB results; training courses for national partners in adaptation and use of ASB methodologies in order to expand the pool of collaborating national scientists; training of national partners in project writing and fundraising; investing to enhance national partners' information and communication technologies; and other investments in infrastructure and equipment. Among the most notable of the training courses reviewed by the Panel were those in methods to assess land use alternatives (conducted in eight developing countries) and, most recently, a highly innovative training workshop on scenario development jointly conducted with ICRAF and the Millennium Ecosystem Assessment.

The Panel finds significant ASB activities targeted on building global capacity for iNRM in the tropical forest margins. This work is not entirely distinguishable from ASB's basic research. Nonetheless, the Panel found that it is worth emphasizing the capacity enhancing aspects of the Program's work on framing and analysis of ASB's pan-tropic problem domain and on developing and operating global benchmark sites. Moreover the Panel finds that in the activities conducted through its personal and institutional networks the ASB systemwide program has become the preeminent global forum bringing together CGIAR, NARS and independent scientists working on joint goals of conservation and poverty alleviation in tropic forest margins. This "social capital" creation is surely one the Program's most important if emergent activities.

Conclusions

The Review Panel finds that the ASB has employed iNRM approaches to produce research-based knowledge relevant to its core mission in highly innovative, effective and efficient ways. Its problem-driven approach, anchored in the needs assessments noted above, has assured the relevance of its activities. The Program has been a leader in devising dialogue-based means of integrating across relevant disciplinary, institutional, spatial/temporal and knowledge boundaries in addressing those problems. Its initial and sustained commitment to generating comparable, co-located data across its benchmark sites, has lifted ASB's work beyond the isolated case studies so common in the field. Coupled with the strategic use of its GCO to lead synthesis efforts, this has created a truly global public good of reliable knowledge regarding functioning of human-environment systems at the tropical forest margin around the world.

The ASB has made use of innovative technologies and analytical methods to apply research results in benchmark sites. New iNRM concepts with potential for generating substantial impacts have been tried in the field by partners in benchmark sites. Successful experiences have been distilled into procedures and strategies that have wider application within benchmark countries as well as across regions. Research on the policy domain has identified major obstacles to wider application and produced recommendations for institutional and legislative reform that facilitate dialogue and debates at national levels but also in

international forums. ASB has also dedicated efforts to establish policy dialogues with key international technical and financial assistance agencies.

The ASB research partnership seems to be an efficient and effective mechanism for capacity building. Efficient in that through its agenda setting mechanisms at the local, national, regional and global scales, ASB capacity building can be targeted at perceived weaknesses of partner capacities in specific areas or skills required for implementing the agreed upon research agenda. Effective in that the trainees can apply their newly acquired knowledge or skills directly in the research conducted by the consortium and that they can share their experience and views through the *fora* and mechanisms provided by the consortium for agenda setting and synthesis of research results. Through their participation in the research partnership all parties seem to have benefited: the NARSs through capacity building and access to international science and networks, the IARCs through access to NARS expertise and facilities, and all parties through the joint development and testing of iNRM paradigms in a stimulating and open learning and action environment.

3.4 Outputs

As defined in Chapter 1, *Outputs* are products produced as an immediate result of the activities of ASB, e.g. reports posted to its web site, articles submitted to journals, innovations developed at its field stations, training courses offered. *Output* is thus the final internal result of the ASB Program – i.e. the last item on the chain of results that is primarily under control of the Program itself. Its “output” is thus what the ASB wants the world to see and read and hear about and, as such, should correspond closely to its goals. The account of output presented here also sets the stage for the analysis of uptake already presented in Chapter 2. The difference between the Program’s output and the uptake of its results by the outside world is, in an important sense, the difference between what ASB wants to say, and what it has gotten the world to hear.

The Panel found that ASB activities produce a great variety of outputs. Different outputs have a manifestation at different levels, local, national, regional and global levels. For example, at the local level it includes products such as innovative schemes for introducing improved pasture technologies. At the national and regional level, findings from research are translated into policy recommendations. At the global and international level the GCO integrates research on issues of global interest that can be disseminated to a variety of audiences. Finally, ASB outputs include feedback knowledge for integrating its own innovations on refining and adapting its own agenda to evolving conditions. Ideally, the Panel would have liked to analyze outputs targeted at the three principal ASB result categories of knowledge, action and capacity. Unfortunately, available data did not allow quite this separation. We, therefore, adopt below a path shaped by data availability, analyzing first the “product” outputs documented in the ASB (Product) Database, and second the training related outputs documented in the ASB Training Database. This done, we attempt to step back from the categories imposed on us by the data, and ask about the overall structure of ASB outputs.

Product outputs

ASB has maintained a record of its “product” outputs in the “ASB Database” already noted in Chapter 2.⁹² This is an immensely useful catalogue of tangible results produced by the Program over the course of its existence, coded in ways that let it be analyzed for product type, authorship, disposition, etc. In particular, the Database codes for 17 categories of output. In addition to typical academic forms of journal articles and books, major output types include the following: *Policy Briefs*, which extract lessons from experiences around the world that have relevance for a broader audience of decision makers, policy advisors and the general public; *ASB Voices* portray perspectives from local people and illustrate for a wider audience their values, restrictions they face and the ways in which they cope and adapt to stresses and opportunities; *ASB Success Stories* describe specific ASB experiences that have been particularly effective in creating desirable results on local income generation and environmental quality in forest-agriculture landscapes; *ASB Lecture Notes* focus on research results from ASB work judged to be of interest to the academic world; and *ASB Thematic Working Groups Reports*, as the name suggests, make analyses of specific subjects, such as the integration of social and economic indicators in the use of the ASB matrix, widely available to users. *Country Synthesis Reports* summarize results of work at the benchmark sites. In addition, the Database lists a small number of less conventional output materials, including web sites, video and CD productions, and posters.

Summary data reflecting the changing amount and composition of the Program’s outputs over the course of its existence are presented in Table 3-B. The Table shows a total output of 769 documented products over the lifetime of the Program (to mid-2005), or an average of about 64 per year. The mix of output is dominated by conventional research products of journal articles, conference papers, monographs and book chapters, which together account for about three quarters of the total output.

Overall, the total output quantity has only grown by about 20% between the first and second five years of the Program. The mix, however, has changed substantially, and has done so in the direction of emphasizing much more heavily in recent years synthesis products (especially books), policy outreach products (especially the *Policy Briefs* series) and training materials (especially the *Lecture Notes* series). In the Panel’s view, both the total quantity and the direction of the changing mix of the output products listed in the ASB Database are appropriate for the evolving character of the ASP Program.

Training outputs

Several outputs related to ASB’s capacity building goals have already been noted in the discussion of “product” outputs above. These include particularly the outputs classified in Table 3-B under “Curriculum review/training reports”, and “Distance learning modules” – particularly the ASB “Lecture Note” series that our assessment in Chapter 2 showed to have such substantial uptake outside of the Program. An additional set of capacity related outputs from the Program, however, is the ASB group training courses themselves.

As shown in Table 3-C, nearly 200 courses have been offered to audiences from the local to the global scale since the inception of ASB. The number of offerings has generally increased over time, with twice as many courses offered (on average) in the last 5 years of the Program than in the 5 preceding year. The recent trend has been toward a much larger number of

courses offered at the local level, with lesser gains at the regional and international scale, and a slight decline in the average number offered at the national scale. As noted in our discussion of the impact of these courses in Chapter 2, a lack of comparative data on training across the CGIAR makes it difficult to interpret the substantial amount of data we do have for ASB. Nonetheless, the Panel found the general trend in numbers and distribution of training courses to be plausible given the maturing character of the overall Program.

The inadequacy of comparative data notwithstanding, the Panel found the overall quantity of output created by the Program to be impressive. Our one substantial concern was the relative absence of not only data but even incidental evidence that the Program was tracking its generation of outputs related to new technologies and policy reforms. The Panel found no systematic summary of these outputs, beyond what was covered in the *Policy Briefs* publication series, and no evidence of a strategy for assuring that those technology and policy reform outputs that were produced (of which there are clearly several) were in fact being targeted to appropriate audiences beyond the immediate circle of the ASB research community. In the view of the Panel, such tracking and targeting would be an important component of a Program-wide strategy for translating research results into action, and for providing feedback on ASB recommended paths to innovation and action.

3.5 Summary findings of the evaluation

The Review Panel concludes that ASB has worked effectively and efficiently in pursuit of its core mission to “raise productivity and income of rural households in the humid tropics without increasing deforestation or undermining essential environmental services.

Goals and priority setting

Summary: The Review Panel finds that the mechanisms employed by ASB in its reflexive approach to goal and strategy (re)definition have been both efficient and equitable. As effectively as any organization we know, it has used systematic reflection on its own research and experience not only to learn better answers to its original questions, but also to learn better questions to ask. In so doing, the Program has become a progressive driving force for articulating the more complex, realistic and integrated view of human-environment interactions at the tropical forest margins.

The Review Panel finds that one of ASB’s greatest accomplishment may well be its success in functioning as a dynamic learning organization. As effectively as any organization we know, it has used systematic reflection on its own research and experience not only to learn better answers to its original questions, but also to learn better questions to ask. In so doing, the Program has become a progressive driving force for articulating the more complex, realistic and integrated view of human-environment interactions at the tropical forest margins that we described in our evaluation of Program impacts. It has also played a central role both within and beyond the CGIAR in shaping contemporary thinking about ecoregional approaches to iNRM.

The Review Panel finds that the mechanisms employed by ASB in its reflexive approach to goal and strategy (re)definition have been both efficient and equitable. ASB is ‘problem driven’, with problem identification done as a collaborative effort involving participation and consultation at many levels. Virtually every individual we interviewed who had been

involved in this process praised its openness, transparency and low transaction costs. These admirable characteristics are achieved less through formal rules and procedures than through the palpable mutual respect and sense of mission shared among the participants. The Review Panel's only concern is that an essential strategic management process so dependent upon the personal relationships among its members may be difficult to sustain as core individuals move on in their careers.

These strengths notwithstanding, the informal priority setting system that served the Program well through its first five years has been increasingly unable to handle emergent tensions in three areas: i) allocation of effort to create scientific knowledge and technical innovation versus effort to move that knowledge and know-how into practice; ii) effort devoted to addressing development goals vs. conservation goals; and iii) effort devoted to providing global public goods versus regional and local ones. The Program has, with its new Mid Term Plan, put in place new "impact-based" planning procedures that are very much what modern results-based management approaches would recommend to deal with these tensions.

Mobilizing inputs

Summary: The Panel concludes that while ASB as a Program has been effective in raising an increasing level of financial resources, these resources have been both inadequate in total amount and imbalanced in allocation across tasks to enable the Program to realize its full potential. On the human resource side, the ASB consortium has gathered a team of excellent scientists at all levels, well mixed with regard to discipline, gender and geographic origin.

The total annual budget for the Program, averaged over its lifetime, was about US\$ 6.4 M. Although annual funding over this period saw periods of both increase and decline, the overall trend was positive, with the annual budget in the Program's most recent five years about 50% higher (in real terms) than in its first five years. Over the lifetime of ASB, on average about 30% of its income was received by the global program, about 60% by its regional and national partners, and about 10% by its various associated activities. About 40% of the funds coming in through the global program were passed directly to the regional/national and associated programs. Over the first five years of the Program, the ratio of global to partner expenditures was about 1:2, whereas over the last five years its leverage increased substantially to a level of about 1:9.

Despite these positive trends, donors are increasingly inclined to target investments on specific projects that reap marginal benefits from ASB's decade of work as a Systemwide Program (SWP), while neglecting the global activities that have allowed ASB to produce, and to become, a global public good. This has left high value work un- or under-funded in a number of areas including global coordination and governance; regional and national facilitation; capacity building to use ASB outputs; synthesis of findings; initiating new science; and – above all – carrying technology and policy findings forward into application.

ASB has recently designed what the Panel found to be a reasonable fundraising strategy that targets scarce human and time resources on three priority areas: 1) leading fundraising for the ASB Global Coordination Office; 2) supporting ASB regional and national partners'

fundraising activities; and 3) collaborating with others in developing ‘mega initiatives’ such as the ‘Rainforest Challenge Program.’

The Panel finds that the ASB consortium seems to have been able to gather a team of excellent scientists at all levels, well mixed with regard to discipline, gender and geographic origin. It has also offered sufficient value to have been able to retain the interests and engagement of these individuals, even when financial and institutional ties no longer bound them to the Program. Nevertheless, the maintenance of the team cannot be taken for granted, especially as the “founders” move toward other careers or retirement. Steps will almost certainly need to be taken to ensure the continuity in staff excellence, in particular at the national levels.

Activities

Summary: The Panel finds that the ASB has employed iNRM approaches to produce research-based knowledge relevant to its core mission in highly innovative, effective and efficient ways. Its problem-driven approach, anchored in the needs assessments noted above, has assured the relevance of its activities.

ASB has been a leader in devising dialogue-based means of integrating across relevant disciplinary, institutional, spatial/temporal and knowledge boundaries in addressing those problems. Its initial and sustained commitment to generating comparable, co-located data across its benchmark sites, has lifted ASB’s work beyond the isolated case studies so common in the field.

The ASB has made use of innovative technologies and analytical methods to apply research results in benchmark sites. Research on the policy domain has identified major obstacles to wider application and produced recommendations for institutional and legislative reform that facilitate dialogue and debates at national levels but also in international forums. ASB has also dedicated efforts to establish policy dialogues with key international technical and financial assistance agencies.

The ASB research partnership has been an efficient and effective mechanism for capacity building. Efficient in that capacity building is targeted at weaknesses of partners identified through joint research; Effective in that the trainees can apply their newly acquired knowledge or skills directly in the research conducted by the consortium.

Output

Summary: The Panel finds that both the total quantity and the mix of the output products produced by ASB are generally appropriate for the evolving character of the ASB Program. Regrettably, ASB does not track its outputs related to new technologies and policy reforms, almost certainly contributing to the relatively low impacts of those products that we documented earlier.

ASB activities translate into a number of outputs at local, national, regional and global scales. The ASB Database shows a total output of 769 documented products over the lifetime of the Program (to mid-2005), or an average of about 64 per year. The mix of output is dominated by conventional research products of journal articles, conference papers, monographs and

book chapters, which together account for about three quarters of the total output. The mix of outputs has changed substantially over the life of the Program, in the direction of emphasizing much more heavily in recent years synthesis products (especially books), policy outreach products (especially the *Policy Briefs* series) and training materials (especially the *Lecture Notes* series).

While the output of the ASB program is impressive, the Review Panel concluded that the dissemination of knowledge acquired on new technologies and policy reforms needs to be greatly improved to reach audiences beyond the immediate circle of the ASB research community that are instrumental in translating research results into action and that are able to provide valuable feedback on ASB recommended paths to innovation and action.

ASB has offered nearly 200 courses to audiences from the local to the global scale since the inception of the Program. The number of offerings has generally increased over time, with especially strong increases in the number of courses offered at the local level.

The Panel's one substantial concern was the relative absence of not only data but even incidental evidence that the Program was tracking its generation of outputs related to new technologies and policy reforms. In the view of the Panel, such tracking and targeting would be an important component of a Program-wide strategy for translating research results into action, and for providing feedback on ASB recommended paths to innovation and action.

4 HOW WELL HAS ASB BEEN MANAGED AND GOVERNED?

In this Chapter the Panel examines the effectiveness and efficiency of ASB provisions for management and governance. Following the general strategy for this Review outlined in Chapter 1, and responding to the particular Terms of Reference provided by the SC, the Panel has devoted particular attention in earlier chapters to documenting, evaluating, and assessing the results of Program's overall performance in research planning and priority setting; providing quality global public good research outputs through standardizing methods to ensure cross-site comparability; resource mobilization; dissemination of results to the larger community; and sustaining and creating strategic partnerships to achieve goals. Here we draw on those findings to inform a review of how effectively and efficiently the Program's key organizational elements have contributed to those results. We begin with a short summary of the Program's organizational structure and governance procedures (para. 4.1). We then turn to a discussion of the performance of the following key components: the Global Steering Group (para. 4.2), the Global Coordination Office (para. 4.3), and relations with ICRAF as the Program's host Center and with other elements of the CGIAR System (para. 4.4).

4.1 Organizational structure and procedures

ASB is a multi-institutional R&D consortium that seeks to apply integrated natural resource management (iNRM) approaches to learning and action through long-term engagement with local communities and policymakers at various levels. The Consortium has developed into a partnership of more than 80 institutions around the world, including research institutes, NGOs, universities, community organizations, farmers' groups, and other local, national, and international partners. The formal governing body is the Global Steering Group (GSG). Though initially larger and more heterogeneous, since a consolidation in the late 1990s the GSG consists of 11 institutions comprising 6 NARs (Brazil, Cameroon, Indonesia, Peru, the Philippines, Thailand) and 5 IARCs (CIAT/TSBF, CIFOR, ICRAF, IFPRI, IITA). The GSG was chaired by ICRAF until 2003, but under new provisions for elected rotation among institutional members is now chaired by CIFOR. The convening Center of ASB is ICRAF, which has hosted the Program since its inception. Coordination and facilitation is provided by a Global Coordination Office (GCO), housed at ICRAF. The GCO consists of a Global Coordinator (since 2000, Thomas Tomich), 2 other professionals plus 1 JPO. The organizational structure is rounded out by 3 regional facilitators and 6 national facilitators provided by partner institutions.

Variants of the organizational structures and governance relationships summarized above have been in place throughout the history of the ASB Program. A formal consolidated governance document did not exist for the Program, however, until December of 2004. At that time such a document was approved by the Global Steering Group.⁹³

4.2 The Global Steering Group

The Panel arranged for one of its members (KH) to attend the GSG meeting in December 2004 in Bogor and to interview many of its members there. In addition, the Panel later met

with the Chair and selected members of the GSG, reviewed the minutes of 14 past GSG meetings, and read the relevant comments about the GSG that had emerged in the course of the ASB strategic dialogue.⁹⁴

Based on this work, the Panel finds that the most important property of the Global Steering Group (GSG) is that it in practice constitutes a forum in which key research and institutional leaders who participate in the ASB Consortium periodically get together to discuss what they've done, and what they should be doing next. The resulting networking function turns out to have played an immensely important role in the development of both ASB's agenda, and the sense of shared mission and commitment so evident in the Program's core participants. Moreover, because of the decision to hold the GSG meetings in different places where ASB works, the networking function extends to bench scientists and field workers throughout the pan-tropic domain. This has meant that its not just the "Program" as a collective acronym that studies the full range of circumstances represented by the ASB benchmark sites, but rather that through time many of ASB's key researchers achieved first hand knowledge of research methods, results and challenges at locations other than their own across the ASB domain.

Beyond this broadening of perspectives, the networking character of the GSG meetings has meant that the research agenda ASB develops and GSG approves are truly joint, interactive creations of researchers from across the benchmark sites. As a result, reading the minutes of the some of GSG meetings turns out to be positively exciting (sic) – more like looking in on a dynamic research seminar than the proceedings of a governing council. Not surprisingly, with this flavor of the meetings, a number of multi-national research collaborations eventually pursued by ASB can be traced back to interactions initiated at GSG meetings.

What takes the GSG beyond being *merely* a research seminar to serve its role as a promoter of research programs is the fact that many of its members are representing institutions as well as research. Thus, at least for the institutions playing active roles on the GSG, the research ideas that emerge from the Group's meetings already are well along to having "buy-in" from the institutions that are ultimately called on to support the research through commitment of human or financial resources.

From the evidence available to the Panel, the GSG seems to function in an acceptably transparent and democratic manner. This is all the more the case now that a formal governance charter with inclusion for rotation of chairing is in place for the GSG. Agendas are negotiated, supporting materials are distributed in advance, minutes appear promptly and were felt by participants we interviewed to accurately reflect the sense of the meetings. We were especially impressed by responses to our questions about why the record seemed to show that formal advisory decisions of the GSG generally managed to be taken unanimously. This, it turns out, is not because the GSG is a rubber stamp or that some individuals dominate its deliberations. Rather, it was that the GSG makes extensive use of informal working groups in preparing key items for decision. It's in these working groups – where the collegiality and joint commitment noted above keep within constructive bounds what are clearly sometimes active disagreements – that the real bargaining and accommodation seem to be taking place. That said, our interviews also made clear that the GSG has made some very tough and controversial decisions over the course of its history.

The Panel comes away from its review of the GSG seeing it as an effective and efficient mechanism by which participants in a complex, world-wide research program jointly and consensually steer their own research work.

The very strengths of the GSG as a tightly knit group committed to jointly shaping their ASB research seem to limit the utility of the Group to perform several key management and governance functions. In particular, as ASB participants themselves have pointed out, the decision in the late 1990s to narrow the membership on GSG largely to IARCs and NARs has left ASB's highest level governance structure with a reduced ability to engage – at least formally - the views of stakeholders from other organizations and perspectives. This formal limitation is mitigated, to be sure, by the frequent informal attendance at GSG meetings by guests from a variety of international organizations (e.g. funders, NGOs, etc.). And many of the members are clearly in touch with local stakeholders in their own regions, and do not hesitate to bring the voices of those stakeholders into the GSG discussions. Nonetheless, the Panel found that the GSG presents no formal venue for engaging in the steering of ASB the voices of researchers or users working in the ASB domain who do not happen to be (already) members of the ASB Consortium. In particular, it presents no direct mechanism by which the voices of those who might use ASB outputs to change what is done in the world can regularly engage ASB researchers in a dialogue over research and outreach priorities. To acknowledge that some GSG members work hard to bring those voices to the table is not to say that such representative presence is the same as having the users there themselves.

This finding of a structural “deafness” (or at least “hearing impediment”) in ASB's governance mechanism with respect to voices outside of ASB causes us particular concern because of our finding, already reported in Chapter 2, that ASB results are not as widely known outside of its own community as they could and should be. The Panel acknowledges that there would be costs to (re)expanding the GSG to include representatives of such voices – in particular, such an open GSG would almost surely lose some of the shared vision and mutual commitment that has helped to make it so effective at what it does do. But if those costs are judged to be unacceptably high, then surely the Program should consider creating an additional forum in which outside voices could be heard, and in which ASB's top researchers could speak collectively about their results to others active in the ASB domain. This is the role that “visiting committees” or “advisory committees” frequently play for universities and other research institutions. It is a role that this Panel has found itself (uneasily) playing in some of its discussions with ASB. But an external evaluation panel convened once a decade can hardly be the right way to organize a continuing dialogue between ASB and the broader world it studies.

4.3 The Global Coordination Office

The Global Coordination Office (GCO) performs the executive task of informing and implementing the governance decisions of the ASB. As noted above, the GCO is run by a Global Coordinator (GC) and small staff, and backed by 3 regional and 6 national facilitators provided by partner institutions. Responsibilities for the GCO have been variously interpreted through the history of the Program. The strategic planning process undertaken by the Program over the last several years has clarified the most important tasks of the

Offices, which are now (as of late 2004) formally specified in the previously noted ASB Governance Document. These tasks include support to the GSG; promotion of ASB publication and training outputs; support to partner programs (including fundraising, direct support and capacity building); global synthesis of ASB results; and public awareness and information dissemination for policymakers and other users.⁹⁵

We focus here on the strategic role of the GCO as a whole, rather the personal performance of any of its professional staff. (We note that the performance of the individual holding the GC position is assessed annually in a performance review by ASB's GSG and incorporated into the annual personnel review by the host institution, ICRAF. We did not seek to duplicate those personal evaluations here). The Panel's evaluation of the performance of the GCO is based, above all, on our documentation of results already reported in Chapters 2 and 3. In addition, we interviewed ASB regional and national program leaders, other members of the GSG, ICRAF management, and leaders of outside organizations that have significant dealings with ASB.

We turn now to the specific evaluations requested in the Terms of Reference for this Review. On these, the Panel advances the following findings:

- The GCO has played an effective role in facilitating the largely successful process of goal and priority setting documented in Chapter 3. The options it has presented to the GSG have been well documented, accompanied by balanced assessment of the strengths and weaknesses of alternatives. Beyond this staffing role, the GCO has been actively engaged in interacting with the larger community to seek out niches for productive ASB engagement (e.g. the Program's role in the Millennium Ecosystem Assessment). The GCO has in the last several years led the process of self-reflection and learning that has been central to ASB's evolution of its current strategic plan (e.g. Tomich et al., 2004). The GCO is widely credited with having provided leadership in shaping the environment of mutual regard and collaboration that, as we noted in the preceding section, is so important to the functioning of the GSG as a collegial governing body.
- The GCO has worked effectively to help make ASB a highly productive source of quality publications in the peer-reviewed literature. The present GC has taken a lead role in editing several key publications. Although the Panel could not find that GCO has instituted a formal process of internal quality control on publications, the exceptionally heavy emphasis that the Program has put on publishing in peer-reviewed publications has provided that control in the best way possible.
- The GCO – or at least the coordinating function for which it is ultimately responsible – has done an exemplary job in standardizing methods to ensure cross-site comparability. It is true that the core work here was performed by the Thematic Working Groups, but the GC led one of those groups, and by the account of participants was instrumental in fostering the others.
- The GCO has been extremely active in fostering strategic partnerships with other organizations to advance ASB goals. Beyond the fostering and nurturing of connections at the benchmark sites, examples include the work with the aforementioned MEA as well as the lead role taken by ASB in the Rainforest Challenge Partnership.
- The GCO has been extremely effective in advancing the several important synthesis documents that have recently emerged, or are about to emerge, from the Program (e.g. the GC is lead editor in the Ecosystem Services special issues and the Millennium

Ecosystem Assessment, lead author of key chapters in the Global Synthesis book edited by Palm et al.).

- The GCO's effectiveness in resource mobilization is a more complicated story. On the one hand, as demonstrated in Chapter 3, the overall budget of ASB has increased substantially (in real as well as nominal terms) over the life of the Program. A sizable fraction of the resources brought in through the GCO have been redistributed to the national and regional partners, resulting in the 1:9 global: local leverage we documented in Chapter 3. That said, the total amount of funds brought in to the global functions of ASB has declined. And as we argued in Chapter 3, coordinating functions at both the global and national levels are now badly underfunded. While the responsibility for the severe resource limitations now facing the Program reflects systemic problems as well, this is an area in which the GCO cannot be said to have performed as well as the Program might have wished.
- Finally, on the matter of connecting ASB research results to practice, the Panel showed in Chapter 2 that although there are multiple instances of policy impact of ASB results in which the GCO has been intimately involved, there remain many potential audiences for ASB results that are not currently aware of what the Program has to offer. This shortfall cannot be laid entirely at the feet of the GCO, but neither can it be said that the GCO has resolved the problem.

All of the above findings are targeted on the *effectiveness* criterion of evaluating CGO performance. The *efficiency* criterion proved harder for the Panel to evaluate. We have, however, had the experience of benefiting from an extraordinary amount and quality of support provided by the GCO for this Review. We have also heard from others, and analyzed time budgets of the various GCO professional staff. Based on this admittedly piecemeal evidence, the Panel can only conclude that the GCO is putting out far more useful product than it has any right to produce with the limited human and financial resources available to it. Although, as our evaluation in the previous paragraph suggests, there are areas in which ASB would be better off were the CGO more efficient and effective in deploying its resources, the Panel finds that the GCO has been and continues to be an extraordinarily high value and high leverage investment of ASB funds.

4.4 ICRAF's Convening Role, and ASB's relations to other CGIAR Centers

ICRAF has hosted ASB's Global Coordination Office since the Program's inception. The Terms of Reference for this Review charged the Panel "to evaluate the effectiveness of ICRAF's convening role, including the relation between ASB and ICRAF's own research agenda, and taking into account the synergies generated and the transaction costs incurred." To meet this charge, the Panel interviewed past and present ICRAF management, a number of ICRAF scientists working in other problem areas, and members of ASB's CCO and CSG. The Panel also examined references to ASB in ICRAF documents, and to ICRAF in ASB documents.

From the perspective of both ICRAF and ASB, their relation has been an extraordinarily beneficial, indeed symbiotic one. ASB identifies a long list of important but generic benefits it receives from ICRAF, including an essential international legal identity for ASB work, access to GGIAR donors, operational policies and guidelines, and administrative support.

Beyond this generic support that would presumably come from any host, the Review Panel found that ICRAF is particularly appreciated by ASB members for the consistent support that senior Center management has provided through the years, including crucial leadership in its early years. In addition, we found that ICRAF is credited with providing exceptional support to ASB in developing and sustaining core funding from a variety of donors, including CGIAR itself. Finally, it is clear that ICRAF has played the role of “donor of last resort” for ASB during funding crises. Reciprocally, the Review Panel found that ICRAF management and scientists deeply value ASB for providing the “safe space” within which the Center could easily enter into valuable partnerships that otherwise would have been bureaucratically, disciplinarily or regionally much less accessible to them. For example, ICRAF credits ASB with providing the foundation and continuing core of the Center’s Environmental Services theme. More broadly, in ICRAF’s view, ASB has helped to give a strong global dimension to the Center’s regional Programs in the humid tropics. “ICRAF,” said one senior ICRAF manager, “has become an ASB partner, not just a host. If it didn’t exist, we would have to invent it.”

ASB’s relationships with other CGIAR Centers and Programs are more complex. As the Panel has come to understand them, these complexities are not particularly unique to ASB, but would apply to some extent to any Systemwide Program (SWP) operating under CGIAR auspices. At the core of these complexities is the simple fact that in a tight resource environment, any SWP is by design going to be viewed as a potential competitor to the multiple Programs or Centers or turfs that it has been designed to bridge or integrate. The situation is exacerbated when evaluation frameworks reward solo performances preferentially over equally productive joint ones. (Several of our interviewees singled out the US government GPRA⁹⁶ framework, and its cousins in the World Bank, as particularly pernicious examples of such frameworks). In such circumstances, incentives push against cooperation, and encourage “free riding” – enjoying the benefits of a system-wide entity without paying for one’s share of those benefits. This Panel found examples of both of these pressures exacerbating ASB’s already problematical funding position. In fact, any time that ASB (or, we assume, any other SWP) succeeds using its cross-Center perspective to launch or promote a new line of productive research, existing Centers should be (and, in our experience, are) motivated to build up intra-Center initiatives on the same line of work, thereby coming into competition with ASB. This is not a problem that ASB alone can do much to combat. The Panel finds that if the CGIAR and its funders wants vibrant system-wide Programs, they will have to exert some continuing high level leadership in providing positive incentives to Centers for collaboration, thus addressing the systemic funding challenges of competition and free-riding facing such Programs.

4.5 Summary of findings on governance and management

The ASB is governed and managed through a Global Steering Group that serves as a policy and decision making body, and a Global Coordination Office that functions in an executive capacity. Both groups have recruited highly respected and effective individuals. Lines of authority and responsibility are clear, interactions between the two groups are mutually supportive with innovative ideas and suggestions for improvement flowing in both directions. The Panel finds that this well integrated governance and management structure has been effective and efficient in promoting innovative research that successfully integrates capabilities and concerns across CGIAR Centers, tropical regions,

scales and disciplines. It has been less successful in developing governance mechanisms to assure that strategies for achieving ultimate Program impacts on the world of action are in place and are regularly revised in light of experience. Relationships with the host Center ICRAF have been exemplary, but the Program has not dealt adequately with the governance and management challenge of securing multi-Center ownership and shared responsibility for its support.

The Global Steering Group

Summary: The Panel finds that the ASB's Global Steering Group (GSG) provides an effective and efficient mechanism for Program governance and priority setting.

The Global Steering Group does indeed function as the ASB Program's policy and decision making body, as described in the "Governance Document." The GSG appears to be a reasonably a democratic body for its members, led (since recent reforms) by an elected Chair and generally reaching decisions by consensus. Membership seems to be effective in giving those on the GSG a sense of ownership of the Program, and the Program a legitimacy among the partners represented on the GSG. The Panel shares the concern of some ASB participants, however, that active participants who are not IARCs or NARs have no formal voice in ASB's governance of research. But the same features that make the GSG an effective governance mechanism for ASB's research leave it without a comparable ability to engage decision maker perspectives directly in its planning activities. The ASB also lacks an effective governance capacity for providing ongoing feedback and planning to assure that strategies for achieving ultimate Program goals (impacts) are in place and are regularly revised in light of experience. The once-a-decade external reviews commissioned by the SC are too infrequent to do the job.

The Global Coordination Office

Summary: The Global Coordination Office has functioned efficiently and effectively to develop and implement ASB Program goals.

The Review Panel finds that the GCO has played an essential role in enabling the integrated management of ASB and resulting impacts. It has been effective in facilitating the largely successful process of goal and priority setting. The GCO has also worked well to help make ASB a highly productive source of quality publications in the peer-reviewed literature. GCO has done an exemplary job in standardizing methods to ensure cross-site comparability. It has been extremely active in fostering strategic partnerships with other organizations to advance ASB goals. It has helped to advance several important synthesis documents. The GCO's effectiveness in resource mobilization is a more complicated story. On the one hand, the overall budget of ASB has increased substantially over the life of the Program. That said, the total amount of funds brought in to the global functions of ASB has declined, as has support of coordinating functions at both the global and national levels. While the responsibility for the severe resource limitations now facing the Program reflects systemic problems as well, this is an area in which the GCO cannot be said to have performed as well as the Program might have wished.

ICRAF's Convening Role, and ASB's relations to other CGIAR Centers

Summary: ASB's relationship with its host institution, ICRAF, has been exemplary, producing valuable benefits for both the Center and the Program.

For ASB, its hosting by ICRAF as an established CGIAR Center has provided a set of generic but important services including an essential international legal identity for ASB work, access to CGIAR donors, operational policies and guidelines, and administrative support. Beyond this generic support that would come from any host, the Review Panel found that ICRAF is particularly appreciated by ASB members for the consistent support that senior Center management has provided through the years, including crucial leadership in its early years. In addition, we found that ICRAF is credited with providing exceptional support to ASB in developing and sustaining core funding from a variety of donors, including CGIAR itself. Finally, it is clear that ICRAF has played the role of “donor of last resort” for ASB during funding crises. Reciprocally, the Review Panel found that ICRAF management and scientists deeply value ASB for providing the “safe space” within which the Center could easily enter into valuable partnerships that otherwise would have been bureaucratically, disciplinarily or regionally much less accessible to them. More broadly, ASB has helped to give a strong global dimension to ICRAF's regional Programs in the humid tropics.

5 WHAT ARE THE POSSIBLE FUTURES OF ASB?

The Panel was asked to “Assess the need and continuing relevance of ASB and make recommendations as to the evolution of its objectives and role and its organization and funding.” ASB itself has performed extensive recent analyses of the options it faces for the future together with the advantages and shortcomings of each.⁹⁷ The Panel reviewed these materials, considered our own findings, conducted a small workshop discussion with ASB regional program leaders, and interviewed a number of outside experts on the question of ASB’s future.

The Panel identified three options for the future of ASB. We summarize these immediately below, before discussing them each in turn:

1. ASB could *declare victory*, completing the current synthesis activities and draw the Program as a free standing entity to a close over a short period of time. Key research themes would be handed off to Centers than would then specialize on them.
2. ASB could *continue to evolve*, integrating recommendations produced by this review and the Program’s own internal review, while pursuing those of its multiple initiatives that turn out to bear fruit and garner support. Within this scenario there would be room for the ASB to pursue either incremental or radical evolution, the former building from the multiple initiatives now in place, the latter seeking to develop a unifying “modern” vision for the next decade of work in the ASB domain. In either case, what distinguishes this from the next option is that ASB would continue to function primarily as a research, innovation and demonstration program with limited extensions into the world of development.
3. ASB could *engage development* more directly. ASB would continue to evolve as in (2) above, but would devote increasing efforts to establishing a tighter collaboration with organizations and initiatives engaged in implementing and scaling up development action.

5.1 “Declare Victory” – An honourable sunset

The first option - declare victory and close the Program – would merit serious consideration in a situation where (a) the global public goods now at the forefront of ASB research do not rank highly within in the evolving priority structure of the CGIAR, particularly the SC’s recent science plan, or (b) while future research in the ASB domain is of high priority to the CGIAR, that research could be performed equally well - or even better - by the Centers rather than through the system-wide ASB Program and the capacity of regional or national institutions to *contribute to* and implement findings and methodologies pertinent to the ASB domain would be sustained equally well or better by the Centers.

In the Panel’s view scenario (a) is unlikely to happen. On the contrary, ASB’s current and future work is highly relevant to the CGIAR in general and its new research priorities in particular. Threats to the humid tropical and subtropical forest biome do not show signs of abating and large numbers of rural poor, now 1.2 billion of them, will continue to depend in the foreseeable future intensely on forest resources and agriculture for their livelihoods.

Scenario (b) is harder for us to assess, since we have not reviewed the other Centers that would take on ASB's tasks. Certainly what incidental information we gleaned in the course of our ASB review suggests that both ICRAF and CIFOR are addressing today more of the issues we have characterized as the "ASB Domain" than they were a decade ago. Still, no other Center appears to have a comparable experience in carrying out the multidisciplinary and multi institutional research that is needed at the forest-agriculture margins. ASB is the only entity for researchers worldwide tackling the complex, interlinked and multidisciplinary research demands at the tropical forest margins. As documented elsewhere in this review, ASB has a proven capacity to integrate disciplines, institutional styles, and regional expertise working at the tropical forest margins. In the opinion of the Panel – and of many experts interviewed for this Review - this capacity does not readily exist or is as effective within the existing Centers. Indeed, it is not likely that the synergies we have seen developing under ASB Programs among regional efforts of different Centers would be as common or as readily developed were the ASB do be disbanded as a SWP. In fact some express the view that if the system-wide capacity of ASB did not exist, CGIAR would have to invent it. So while the Panel cannot make a definitive judgment on what a Center-based program of work (as opposed to a SWP program of work) in the ASB domain would look like, we are both convinced of the strong future need and demand for research in the ASB domain and sufficiently impressed with ASB's accomplishments as a "boundary-spanning" organization adding "hybrid vigor" to the CGIAR to find it likely that the important work it is doing would suffer substantially were its agenda to be partitioned among established Centers. We also believe that in any serious consideration of a future scenario i) the "burden of proof" should fall upon the Centers, rather than the ASB, to field a convincing argument that the relevant portions of the CGIAR's priority agenda could be more effectively and efficiently pursued by shutting ASB down and dividing its core tasks up among the Centers.

5.2 "Muddle through" – Building on continued adaptation and learning

Under the second option, the ASB would build on the existing ASB platform to formulate a strategic vision for action and create innovative approaches to sustain the successes and address the shortcomings identified in this review. The Panel finds that ASB's record of critical self-reflection and its demonstrated ability to identify and pursue what turn out to be valuable new ideas offer strong support for this option. The ASB already carried out a major effort in 2004 to review and reassess what its vision, major objectives and strategies should be in the medium term. The Panel believes that the formulation of a longer term vision and strategy would contribute to strengthening what we have found to be the crucial functions of boundary-spanning, systemwide approaches to conducted integrated research on problems of poverty and conservation at the tropical forest-agriculture margins.

The central challenges of implementing the "muddling through" option are likely to be the intimately related tasks of (a) rearticulating the rationale and identify of the Program "10 years on" in ways that retained its strongest attributes, kept it flexible, but that provided a compelling modern vision of its mission "beyond ASB", and (b) developing with the CGIAR leadership a viable funding model to implement that vision on a system-wide, multi-scale basis.

The Panel finds every reason in ASB's past performance to believe that with strong leadership and determination from its GSG and GCO it should be able to meet the "vision" challenge ('a' above). We find it an open question, beyond the scope of this review, to answer whether there will be sufficient leadership from the SC and CGIAR as a whole to meet the "funding" challenge ('b' above). Unless both of these challenges are met much of the potential of ASB to contribute to the CGIAR's goals in its domain will go unrealized.

5.3 "Radical engagement" - Linking research more directly with development practice

A third option – engage development more directly - would add to ASB's strategy a substantial and fundamental connection with various development institutions. Some such connections exist in the present Program, but ASB today remains essentially a research and innovation effort with a limited engagement in large scale concrete development operations.

The Panel finds that ASB's ability to promote real change on the ground is significantly hindered by the separation of research and development implementation tasks that it has inherited from its origins in the CGIAR System. Although much of the ASB work involves validating research at the micro scale level and investigating constraints and opportunities for scaling up development actions, ASB's possibilities of direct involvement in operationalizing development at a large scale is limited.

This is clearly an issue that needs to be addressed at levels higher than a single system-wide program, and is thus beyond the remit of this Review. Nonetheless, drawing on its own experience in other domains, the Panel questions whether the CGIAR model distinguishing the creation of global public goods from their implementation at scale is as likely to work as well for the NRM component of the CGIAR's work as it did for the earlier commodity efforts. Many of ASB's research and innovation results take a long time to mature and yield impacts, and require considerable development investments with benefits materializing in the distant future. Thus, for few NRM areas does it seem to us as likely that states, lenders and other development organizations will see the immediate returns on investment that some of the best commodity innovations promised.

This Panel certainly experienced in its field visits and interviews the limitations on ASB impact inherent in its inability in most research themes to move beyond research into supporting implementation at scale. However, there are some types of research results that offer a greater possibility of implementation at scale because, for example, of their differential demands on human and managerial resources or because their political convenience. ASB's experience shows that the implementation of some policy research results such as that that secured greater land tenure rights for the Krui communities may need little direct financial outlays from financial institutions or government and can be adopted quickly. Similarly some technological innovations such as those resulting from ASB's pasture research in Brazil fill a large demand, are politically appealing and so attractive financially that large scale adoption may take place comparatively quickly and spontaneously. A desire to secure a closer linkage between research and development in ASB Program would imply a consideration of these attributes of research results as a dimension in deciding on ASB strategies for the future.

Further, the Panel finds that original concept of the “challenge programs” advanced by the World Bank is a creative and positive response to the kind of dilemma faced by ASB, effectively opening the door to the teaming of research and implementation groups. We find that the approach outlined by the ASB and its partners in its Rainforest Challenge proposal is one that would almost certainly be a positive step toward engaging development for the Program were it to be funded. The Rainforest Challenge Program proposal is purposely designed to bridge the gap between the efforts of conservation and development organizations and between science and policy, designing operational interventions that require a complex combination of technological, institutional and policy innovations. Implementation of such an approach would let the presently weakly linked subsets of science and development organizations to engage in increasingly integrated and coherent programs with a greater scope for influencing change. Effectiveness would likely increase through the two way connectivity between science results and development efforts where research results could in an easier way be tested and multiplied and strong feedback loops would provide valuable inputs in the design of the research agenda.

5.4 Summary of findings on the future of ASB

The Panel concludes that the capacity created by ASB can make a unique contribution to achieving CGIAR and SC emerging goals on integrated land, water and forest management at landscape level. That capacity should be sustained and strengthened.

The Panel finds that a strong case has been made for rejecting option (1) *declare victory and close*. Given the uncertainties (at least to the Panel) over how the SC’s new science priorities will evolve and where the “Challenge Programs” are headed, the Panel does believe that it has sufficient information to make a clear case in favor of either options (2) or (3). An informed choice on ASB’s future will require more clarity about objectives, priorities, and modalities in the environment in which it operates. It would also benefit from an open discussion involving not only existing ASB partners, but also other groups pushing research, conservation and development agendas on the tropical forest margin.