

**ASSOCIATION FOR TROPICAL BIOLOGY
AND
ASHOKA TRUST FOR RESEARCH IN ECOLOGY AND THE ENVIRONMENT**

RESEARCH PRIORITIES IN TROPICAL BIOLOGY WORKSHOP

FINAL REPORT

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EXECUTIVE SUMMARY

As a first step in a three-year process to articulate and disseminate a set of priorities in tropical biology, the Association for Tropical Biology and the Ashoka Trust for Ecology and the Environment held a one-day workshop in Bangalore, India in July 2001. Prior to the meeting, participants were invited to provide input by submitting position papers on particular topics. The workshop was attended by over 80 participants. After general group discussion, small groups broke out to consider research questions, constraints, and support for three emerging topics: basic tropical biology and systematics; humans and the landscape, and education and communication.

There was substantial interest in the process and the content from a wide variety of tropical biologists who are from many countries and academic disciplines. We witnessed a willingness on the part of many scientists to take time from their own projects and extend their expertise and critical thinking to this enterprise.

The breadth of topics covered at the Bangalore conference suggests that research priorities will cover basic biological subject areas as well as conservation and human interactions with the environment. ATB and ATREE must continue to promote basic research in tropical biology as we incorporate additional disciplines into the mix, such as conservation, environmental biology, and the social sciences.

INTRODUCTION

Research in tropical biology is at an exciting and crucial point of its development as a field of scientific inquiry and as a key contributor to understanding and potentially solving pressing environmental problems. Despite the relative youth of this field, a growing pool of information generated by scientists in tropical and non-tropical countries, coupled with improved scientific facilities and growing public interest, is experiencing increasing scientific and public interest. The rapidity of increasing ecological degradation is taking place in tropical landscapes, and the recognition that tropical, temperate, and boreal ecosystems are directly linked have also added urgency to gain a better understanding of tropical ecosystems. In this report, we describe efforts by the Association for Tropical Biology (ATB) and the Ashoka Trust for Research in Ecology and the Environment (ATREE) to formally articulate research goals and priorities in tropical biology. Specifically, we summarize the outcome of a 1-day workshop on “Research Priorities in Tropical Biology” held in Bangalore, India in July 2001.

CONTEXT AND JUSTIFICATION FOR THE WORKSHOP

The idea for producing a report through ATB and ATREE on research priorities for tropical biology began with a discussion by the ATB Council Meeting led President Bawa in Bloomington, Indiana, in June of 2000. The basic vision was to formulate a “white paper” on research priorities that would incorporate input from a multitude of individuals and organizations over a period of several years.

Until recently, many researchers of tropical biology have worked individually or in small groups on relatively short-term, single-discipline research projects with small amounts of funding. A few exceptions to this pattern exist, e.g., the Organization for Tropical Studies (OTS) has served to facilitate and integrate tropical research projects, but its focus has been almost entirely restricted to the New World tropics. Reports of tropical research presented at recent international meetings indicate that research priorities should be set, and that larger-scale, longer-term research questions can and must be addressed. Research teams must coalesce, database tools should link comparative data, and more collaboration across international and hemispheric borders should be encouraged.

Research over the last two decades has led to the realization that organisms, interactions, and processes that are studied by tropical researchers bear directly and indirectly on such issues as the maintenance of biodiversity, carbon cycling, the effects of global climate change, and sustainability of natural resources. These should be addressed in concerted ways by the tropical biology research community for three reasons: 1) scientific curiosity about fundamental biological questions; 2) provision of useful answers to issues of importance to other humans; and 3) increased access to funds that will promote our field and increase our capacity to learn more about tropical ecosystems. We recognize the opportunity for governments to meet treaty and other political commitments through this process and this can unlock substantial funding through governmental agencies to which individual researchers do not generally have access.

To address these issues, we set out the following sequence of activities that would lead to the articulation and dissemination of research priorities:

- solicit position papers
- convene ATB workshops
- forge partnerships (including NGO's and funding agencies)
- disseminate our initiative for setting priorities (e.g., Tropinet)
- identify our audiences, including educators who will teach our priorities
- draft interim and final products

To initiate the process, we organized an intensive one-day workshop that immediately followed the three-day conference organized by the Association for Tropical Biology, in Bangalore, India, in July 2001. We brought together an international cadre of researchers from many academic disciplines with the common goal of articulating long-term and potentially large-scale research goals of tropical biology research. We charged the group on what is needed to deliver research that will make a difference to our understanding and sustainable use of the biosphere within 5, 10, 20, and 50 years. Our vision is that this workshop would be a timely and "keystone" meeting that will provide representatives of the tropical biology research community the opportunity to discuss short- and long-term research directions and plan for their implementation.

ANTICIPATED OUTCOMES

We anticipate four possible outcomes of this exercise: 1) an opportunity for self-reflection, both individual and collective; 2) partnerships with other allied organizations; 3) a stronger ATB profile with decision-makers and funding agencies; and 4) a set of priorities with strategies to address these priorities and identification of the resources needed to implement those strategies.

We anticipate creating four products: 1) a compilation of position papers; 2) a science-based document describing general and specific research needs that will be oriented towards tropical biologists; 3) a "white paper" with glossy publication that will be oriented towards funding agencies and decision-makers; and 4) contributions to the ATB web site.

WORKSHOP STRUCTURE AND ACTIVITIES

Our general plan is to meet twice per year, once during the ATB Annual Meeting to gather input and disseminate information on our progress, and once mid-way through each year in a retreat format for intense work and writing (Table 1).

Our first workshop coincided with the Annual Meeting of the ATB, which was co-convened with ATREE in Bangalore, India (July 16-20, 2001). The structure of this process extended before and after the workshop itself. Prior to the workshop, we solicited "position papers" from representatives of various subfields of tropical ecology (e.g., pollination biology, sustainable forestry, canopy ecology, forest dynamics) and from the ATB membership as a whole. Three months prior to the meeting, we sent out announcements on the ATB/OTS email bulletin board, posted an invitation on the web, and sent email messages to all Convenors of symposia at the meeting. The representative was responsible for "polling" researchers in his/her subdiscipline, and submitted a 2-3 page synthetic paper summarizing the subfield and putting forth 3-5 research priorities. The representative was also asked to present an estimate of the resources (funds, equipment, staff, capacity-building) needed to realize these priorities.

These position papers were posted on the ATB website, and ample time was available for any researcher to read and respond to these comments. Input from tropical researchers also occurred at all of the symposia offered at the ATB conference, during the body of the meeting, and in the form of written submissions or in discussions. All symposia organizers were strongly encouraged to designate a specific time during their symposia to discuss priorities in that area of research.

Prior to the meeting, an agenda was circulated to encourage participants to think actively about specific issues related to research priorities. These issues include: the present state of the art of tropical biology; links to allied fields; short- and long-term goals and questions for tropical biologists, strategies to meet these goals and answer these questions, and resources needed to implement these strategies (Appendix I).

RESULTS

The workshop was attended by approximately 80 participants. Drs. Bawa, Kress, and Nadkarni led the discussions, and there were numerous opportunities for contributions from participants. We emphasized the need to work collaboratively and to ensure that all voices would be heard. The leaders presented introductory remarks to articulate the context and vision of the workshop. At the end of the workshop, many participants took the opportunity to voice their particular priorities and concerns (Appendix II). This final report of the workshop will be circulated to participants and posted on the ATB website for comments and reactions.

We established and broke into three smaller discussion groups that would focus on major emerging themes within tropical biology: a) basic biology; b) humans and the landscape; and 3) education, communication, and policy. Below is a synopsis of these discussions.

Discussion Group A. Basic tropical biology, ecology, and systematics

Subject areas and basic questions

- Systematics and basic biodiversity inventory
- Research on threatened habitats and species that are poorly known
- Research on process with an integrated approach
- Data resources: availability and dissemination
- Monitoring conservation success

Constraints and required resources

- Expertise and training
- Job opportunities
- Professional advocates and advocacy
- Infrastructure
- Science-based and science-initiated legislation
- Common methodology and technology
- Data sharing
- New career trajectories and rewards
- "Certifying intentions" (i.e., differentiating science and commercial activities)

Solutions and potential sources of support

- Funding, both long-term and directed
- Establishing a common voice among scientists
- Professional lobbyist
- Model MOU's (memoranda of agreement)
- Capacity building

Discussion Group B. Humans and the Landscape

Subject areas and basic questions

- What is the nature of human interactions with the environment considered at a multi-scaled level?
- What are the uncertainties that face human populations and the landscape? In particular, what are the reactions to these uncertainties and the often artificial solutions in tropical regions?
- How can we measure the perceptions and values of people who live in these environments?
- Is the present approach adequate and sufficient?

- There is a need for an increased interface between biology/ecology and social sciences

Solutions and potential sources of support

- Parallel to those in basic biology discussion group
- Increased linkages and interdisciplinary interactions

Discussion Group C. Education, Communication, and Policy-making

Subject areas and basic questions

- Education as a fundamental issue
- Education must consider critical scientific/biological thinking
- Education reduces conflict

Constraints and required resources

- Re-education of teachers, policy makers, and scientists
- Extensive networking among scientists, NGO's, educators.
- Expand boundaries of what are considered environmental problems, e.g., health

Solutions and potential sources of support

- Co-opt the media to good effect
- Convince individuals that they are stakeholders in environmental issues
- Promote message on importance of biocomplexity and not just individual species
- Communicate urgency of problem
- Accept personal responsibility for environmental crisis
- Promote "long-term holistic thinking"
- Biologists/scientist must be clear in their intentions
- Collaborations among individuals and institutions
- Actively seek funding
- Scientists must talk to K-12 students

CONCLUSIONS

As part of the ATB and ATREE missions to foster the best tropical science for our society and tropical organisms, we initiated a process to articulate and disseminate a set of priorities in tropical biology with a first workshop. There was substantial interest in the process and the content from a wide variety of tropical biologists who are from many countries and academic disciplines. We witnessed a willingness on the part of many scientists to take time from their own projects and extend their expertise and critical thinking to this enterprise.

The breadth of topics covered at the Bangalore conference suggests that research priorities will cover basic biological subject areas as well as conservation and human interactions with the environment. ATB and ATREE must continue to promote basic research in tropical biology as we incorporate additional disciplines into the mix, such as conservation, environmental biology, and the social sciences.

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Table 1. Timeline for Research Priorities activities

July, 2001:

Initiate discussion at ATB Annual meeting in Bangalore
Submit draft report

February 2002:

Three-day retreat with ATB principals to continue discussion, set goals, and assign tasks and timetable
Submit draft report.

July 2002:

Present preliminary report at ATB Annual meeting in Panama
Hold 2nd workshop with ATB participants

February 2003:

Three-day retreat with ATB principals to continue discussion, draft interim report, circulate for feedback
Submit draft final report

July 2003:

Present draft final report at Aberdeen meeting
Hold 3rd workshop with ATB participants to discuss methods of dissemination and implementation

February 2004:

Draft and circulate Final Report

APPENDIX I. AGENDA ITEMS AND QUESTIONS TO BE ADDRESSED

I. Overview where tropical biology research is at present; review results presented at recent tropical biology meetings; identify the "developmental stage" of this emerging science.

II. Discuss links to allied fields with representatives from these fields (e.g., temperate ecosystem ecology, sustainable forestry and agriculture). What are the important questions being addressed by non-tropical disciplines for which a developing tropical biology research community could provide insights and data?

IV. Generate short-, medium-, and long-term goals for tropical biology research in the next millennium. Formulate scientific questions that should be addressed, including large-scale, long-term questions that require comparative approaches, harmonized methods, and potential manipulative experiments, as well as small-scale, individual-based research projects.

V. Develop strategies to address these questions. Assess levels of funding, infrastructure, administrative framework, research sites, and database needs to implement our collective and individual research agendas.

VI. Determine who are the end users of answers to these questions (universities, government agencies, general public). What content and in what forms do they need these answers? How can we best transfer technology and build local capacity to tropical regions?

VII. Generate action items and time schedule, and assign tasks to individuals for future progress in this process.

APPENDIX II. General comments by participants

“Globally (both in developing and developed countries) the basic sciences are suffering the most as funding agencies ignore their needs in favor of ‘action-oriented’ work.”

“Must record and quantify tribal knowledge on biodiversity as well as scientific knowledge.”

“Ethnobotany has been accumulating descriptive data on useful plants for 200 years and now needs to move forward with new methods of analysis and development of theory.”

“Do not forget the fundamental importance of basic taxonomy and field collections, especially with respect to bioprospecting.”

“A top priority must be to maintain tropical ecosystems and habitats as well as move beyond our narrow disciplines towards a holistic approach.”

“The restoration/reintroduction of species into habitats must be encouraged.”

“We must develop new ways to make biology, taxonomy, and ecology attractive to students in colleges and universities.”

“Now a critical need to define broader biological and conservation goals and link tropical biologists around the world in a cooperative effort.”

“Recognize the power of remote sensing for monitoring primary and secondary habitats.”

“Do not forget tropical dry forests, high montane ecosystems, mangrove forests, and marine ecosystems as areas of importance.”

“The conservation of pollinators, which are now severely suffering from the impact of human activities, is critical to maintaining ecosystems.”

“How can we maintain our fascination with tropical nature (the “curiosity cabinets” of Victorian times) through the study and documentation of the “cool stories” of natural history as the field of biology succumbs to logical positivism?”

“We must frame our problems within larger spatial, temporal and landscape scales; the human element at the landscape level is the unifying theme that ties together all of our “isolated” fields in tropical biology.”

“Most of our data on tropical biology have been collected in pristine, undisturbed forest habitats and we must now broaden our investigations to in disturbed habitats as well.”

“It is important for us to reach out to the public with our stories and information on tropical biology.”

“A great need exists for studies and the development of methodology on the rehabilitation and restoration of tropical forests.”

“Biological collections must be maintained and taxonomic data must be shared nationally and internationally.”

“We must take a broader perspective and include the social scientists and policy makers in discussions and investigations.”

“The distinction between applied and basic research is fictional; we must integrate these two aspects into our research programs.”

“Trying to fit everything together is a major challenge for conservation, which is not a separate discipline.”

“A priority must be placed on developing predictive capabilities for human population growth and consumerism, which is critical in tropical countries, in order to determine effects on the environment. This is the economics of conservation.”

“Less charismatic organisms, such as insects and invertebrates, can not be forgotten in conservation studies.”

“Tropical habitats, including wet forests, drylands, and coral reefs, are disappearing and there is nothing we as scientists can do about it. The work we do can't possibly make a difference. However, nothing makes sense in tropical biology except for priorities in conservation.”

“Our priority must be synthesizing the various bodies of knowledge about tropical biology and translating that synthesis for the public.”

“We must ‘scale up’ to the challenge of conservation and become activists as tropical biologists in talking to the politicians and policy makers.”

“Our priority must be the increase and diffusion of knowledge about tropical organisms and ecosystems; we can not abandon our efforts to understand how tropical systems work while we try to conserve it. If we have already lost the battle, as some have suggested, then we must increase our efforts to understand and document tropical biology before it disappears.”