CHEC *Points*

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Tropical Rainforest Field Stations:

An initiative for a Commonwealth Interchange on Tropical Rainforest sustainable management and research

Report on the CHEC workshop held as a side event at the 18th Commonwealth Forestry Conference in Edinburgh on 29th and 30th June, 2010.

Introduction

The aim of the workshop was to bring together key practitioners and specialists responsible for tropical rain forest field stations to examine the feasibility and effectiveness of using field centres for research, for training university and school students and for assisting the development of local communities.

The workshop consisted of presentations about tropical rain forest field stations and a wide ranging discussion on Tuesday 29th June and a report to the Commonwealth Forestry Conference at a lunch-time meeting in the Edinburgh International Conference Centre. **Caryll Stephen**, Chairman of CHEC's Board of Governors opened the meeting with a reminder of human dependence on natural systems and the need for us all to take responsibility for our impacts on the environment. **Ian Douglas** described the purpose of the meeting, emphasizing the research and education roles of field stations and the diversity of such centres in the Commonwealth. He illustrated his talk with reference to the Kuala Belalong Field Centre in Brunei, which is owned and managed by the Universiti Brunei Darussalam and the Udzungwa Ecological Monitoring Centre which is owned by TANAPA (Tanzanian National Parks) and is managed by the Trento Museum of Natural Sciences in Italy.

Dr. Waidi Sinun, Head of the Conservation and Environmental Management Division of Yayasan Sabah, Malaysia explained how Yayasan Sabah (the Sabah Foundation, a semi-governmental organisation) holds a large forest concession which provides finance for supplementing and complementing government to improve the quality of life of Malaysians in Sabah – particularly in education and welfare. Management of the forest has to be sustainable to not only maintain timber yields for future generations, but also to protect the environment. Among its educational activities, Yayasan Sabah established the Danum Valley Field Centre adjacent to an undisturbed 438 km^2 lowland tropical rainforest conservation area. The field station works closely with the Sabah Forest Department and the Universiti Malaysia Sabah. It has a Memorandum of Understanding (MoU) with the Royal Society (London, UK) for a major research programme based largely at the field centre. Some 10 UK and 20 other Universities had had researchers at Danum and it has hosted industrial training, tropical field biology, university fieldwork and other courses. Much of the research has had

direct inputs to both sustainable forest management and to environmental education and ecotourism programmes at the Centre.

The mission of the Las Cuevas Research Station in Belize, presented by **Chris Minty** of the Royal Botanic Gardens, Edinburgh (RBGE), is to document and make known the biodiversity of the Maya forest and contribute practical knowledge to its sustainable development and conservation. With an MoU between RBGE, the Belize Forest Department, Maya Forest Enterprises, the Conservation Management Institute and Acadia University, Canada, the station supports research in a biodiversity hotspot with over 1,350 different vascular plants and 109 different orchids. Its impact includes the conservation of 0.75 million ha of rainforest, creation of many local jobs, training over 500 students and support for high profile expeditions. It has encouraged the field training of Belizean students and provided research opportunities for Belizeans in the UK. Most importantly it has sought ways of improving local livelihoods and at the same time gaining some income for the Station by developing a market for organic chewing using chicle from trees in the forest. This combination of good science, local economic activity and some ecotourism is essential for the survival of the Las Cuevas Station.

Dane Gobin, Chief Executive Officer, Iwokrama, Guyana, spoke of the development of science and education at Iwokrama, emphasizing the engagement with local communities and the capacity building built into Iwokrama's programmes. With 16 communities and 7,000 people in the forest, it is essential to combine science with business. The values of ecosystem services have to be stated more clearly, particularly in terms of the significance of rainforests for the global water budget. Nevertheless, it is important that Iwokrama shows an economic return for the investment made in it. Working closely with all stakeholders is showing the way forward.

Kenneth P. Rodney, the Forest Manager for Iwokrama showed how the sustainable forest management programme for Iwokrama stemmed from a joint venture agreement between Iwokrama, local communities and a private forestry company. The 370,000 ha Iwokrama forest is half zoned as a Wilderness Preserve and half as a Sustainable Use Area. Of the latter, nearly 110,000 ha are deemed suitable for sustainable timber harvesting, with a Forestry Stewardship Council (FSC) certified timber harvesting operation in progress for over two years. The forestry operation makes a strong investment in personnel through training and technology transfer. The selective cutting in the present silvicultural system results in a managed forest that maintains the uneven-age characteristic of the original forest. Guidelines and procedures ensure that road building in the commercial forest minimises erosion and damage.

In discussion, **Sydney Allicock**, an Iwokrama community leader, who had been associated with the CHEC – Pro Natura Bina Hill project, emphasised the value of the partnership arrangements and his enthusiasm for co-operation. He felt that in addition to exchange of ideas and experiences between field station managers, local community leaders should be involved as well.

Ian Douglas gave a brief statement about the Makerere University Biological Field Station (MUBFS) at Kibale in Uganda because the two representatives from Uganda were unable to travel to Edinburgh at the last minute. Dr. Jerry Lwanga supplied additional information after the workshop. The station has a long history through its ownership by Makerere University and its role in primate research that has been strongly supported by American institutions. Training courses for up to 30 students are routinely offered at Kibale by the Tropical Biology Association (TBA), McGill University, Canada.

Also under the umbrella of TBA, Liverpool University and the Imperial College, London, bring training courses to MUBFS. Locally, the Departments of Botany and Zoology, Makerere University also hold field courses at this field station. In addition to Makerere University, the Mabarara University of Science and Technology, and Uganda Wildlife Training Institute also train their students at the field station in Kibale, as well as the University of Florida and the Peace Corps. A particular debt is owed to Dr. Thomas Struhsaker of Duke University, USA, who lived at Kibale from the early 1970s to the mid-1980s. He was influential in the Kibale Forest eventually becoming a National Park in 1993 and in training many Ugandan and other scientists who later played major roles in science and education at Kibale, national universities, government and non-governmental conservation organisations.

MUBFS has several spin-offs that are promoting education in the vicinity of Kibale National Park. The largest of these is a programme known as AFROKAPS (American Friends of Kasisi Primary School). This programme has built offices, toilets, library, classrooms and dormitories for Kasisi primary school. For Kanyawara Primary School, AFROKAPS has built houses for four staff members, and four classrooms.

The program started scholarships for secondary and tertiary institutions; so far they supported 83 children in secondary and tertiary institutions. They have improved sanitary conditions for students and schools, in form of sanitary pads for girls and have provided water tanks for safe water.

With a grant from Disney, they have expanded these programmes to Kiko Kigarama, Rwetera, Kyamara, Iruhura, Kiyoyima and Nyabuble Primary Schools.

Another offshoot of MUBFS that is helping education in the vicinity of Kibale National Park is KAFRED (Kibale Association for Rural Development). This was set up in 1992 with help from MUBFS. Its main objective was to promote social and economic development through wise use natural resources. The main activity is ecotourism centred on and around Bigodi Wetland Sanctuary. Funds from this project started the Bigodi Secondary School which is the only secondary school in the area. Recently, they have started supporting the following schools with help from the Peace Corps and North Carolina Zoo (NCZ): Bigodi, Nyabubale, Kiyoyima, Rwengobe, Rugonjo, Bunoga and Rwanjaale. They have trained teachers in environmental education, organised trips for teachers and pupils to Kibale National Park and they have sponsored some children in private primary schools. Through NCZ they have sponsored trips for teachers and pupils to USA.

Michelle Clarke of the National Soil Resources Institute, Wales and Cranfield University, spoke of her experience as a young research assistant and Ph.D. student from the UK working at Danum Valley and interacting with counterparts from Malaysia, Indonesia, Thailand and Vietnam in an interdisciplinary project on erosion in tropical forests. The long-term environmental monitoring at the Danum has already indicated the impact of global warming, with both temperatures and rainfall increasing. Local research assistants permanently based at Danum play the key role in the long term monitoring. Her project would not have been possible without their help. The supportive environment of the field station was integral to her own research and to that of her colleagues.

Discussion of the presentations and other topics ranged widely. Major issues were continuity of activity at field stations, highly successful field stations acting as honey pots with some difficulties in

getting scientists to initiate work at newer or alternative field stations. Field stations were seen as a key element in the training of field scientists: "young people getting their hands dirty!" In Sabah, 80% of High Schools are registered members of the Sabah Nature Club which frequently organises activities at Danum. Many possibilities were raised. Much information was exchanged about existing organisations and links between field stations. These points are incorporated into the summary of the findings of the workshop which follows.

Findings and outcomes of the meeting

Participants at the meeting agreed that a tropical rainforest field station is a human and physical facility for long-term research, education and training to enhance the understanding, scientific knowledge and management of tropical rainforest ecosystems, and the services they provide, to support local livelihoods and resource management.

Tropical rain forest field stations play a key role in the science and understanding in the management of rain forests, including ecosystem services, biodiversity conservation and adaptation to climate change. They provide the basis for long term observations and experiments as well as laboratories and support facilities for shorter term field investigations such as those concerned with taxonomic and geologic field surveys. In particular they have had significant roles in NSF [National Science Foundation]-funded Long Term Ecological Research programmes and projects and the work of the Royal Society South East Asian Rainforest Research Programme.

Field stations have a major educational role, providing opportunities to learn about nature from close experience by people of all ages, from school parties to courses at Masters Level and in-service training for practitioners. They are a key component in achieving environmental education for all, especially for students from local schools and universities.

Tropical field stations provide multiple benefits. They support taxonomic data collection which is needed to understand the biodiversity of the forest. Their continuous activity facilitates the ecological research needed to understand ecosystem dynamics and the consequences of extreme events such as tropical cyclones (hurricanes), landslides, volcanic eruptions and floods as well as the consequences of El Nino and La Nina climatic conditions. Some provide a base for analysing the ecological impacts of forestry activities and for experiments on ways of reducing the impacts of logging. Field-station based studies have led to changes in forestry guidelines and practices. Scientists have used field stations to carry out experiments on enrichment planting to improve forest regeneration after selective logging. Other field station experiments and observations of carbon sequestration by forests have helped to quantify their role in adaptation to climate change.

Table 1 The essential components of a tropical forest field station

People	Full-time, year round occupation
Good Governance	Sound management system
A mandate (commitment to relevance, education, government needs)	Political awareness and links
Access	Accommodation
Infrastructure (e.g. observation platforms, instrumentation, laboratories)	Mobility: forest tracks, vehicles
	Communication: outputs and community relevance

Field stations have carried out trials of non-timber forest products that can be used to raise the incomes of local people. They have also been centres of investigations of freshwater fisheries and the impacts of alternative fishing techniques. They provide opportunities to work with local communities to improve livelihoods and to develop economic activities that use the forest sustainably. The precise commitment and obligations of a field station will depend on its mandate: whether a station has a formal obligation to contribute to development of international, regional and/or national forest and land use policies and practices, or to work to improve local livelihoods, or whether is it quite independent of such obligations.

Educational programmes embrace a wide range of people. Many universities, both in the countries where the field stations are located and from other countries, use field stations for student field courses. The month-long tropical biology courses run in various stations in the Americas, Africa and Asia have been particularly successful and rewarding.

Some field stations encourage, and provide facilities for, ecotourism, sometimes for organised groups and sometimes for individual wildlife tourists, particularly birdwatchers. Others provide, or host, jungle survival courses. In addition to creating jobs for local people, such tourist-related activities can bring a field station valuable income that helps with the long-term operational and maintenance costs of the station.

Field stations can influence decision-makers. The presence of a field station can have an impact on forest management policy and can assist National Parks in their conservation work. In some cases the significance of the work at a field station, or its international reputation for access to undisturbed forest, have been major factors in decision not to harvest timber from large areas of undisturbed forest. Field stations can become a matter of national pride: places to which distinguished visitors are taken.

How many field stations are there in tropical rain forests in the Commonwealth and globally?
Many installations call themselves field stations. Some are commercially run operations primarily concerned with helping wildlife tourists and eco-tourists to experience the rain forests for themselves. Others are research and/or educational establishments often owned and managed by educational or research institutions or charities. A science-based, educational and research field stations will either be owned by a research or teaching organisation or have a Memorandum of Understanding with such an organisation. A strong link with a local University is usually a key element of a successful field station.

The Royal Geographical Society (www.rgs.org), the Organisation of Biological Field Stations (http://www.obfs.org/stations) and The Tropical Ecological Assessment and Monitoring Network (TEAM Network**)** all have lists of tropical field stations. Together they list 33 field stations in tropical rainforests in Commonwealth countries. Four others are omitted from all three lists, giving a total of 37 field stations engaged in research, education and capacity building in the Commonwealth. World-wide there are probably close to 100.

Challenges facing tropical rainforest field stations

One of the greatest assets of permanent tropical rainforest field stations is their ability to sustain long-term data collection of both basic climatic and hydrological condition and changes in forest structure and animal populations. Yet that long-term recording requires long-term funding, management and infrastructure maintenance. Many records require vehicular access to recording stations, yet even the best vehicles find the wet tropical environment harsh and corrosive. Thus the ability to upkeep the research infrastructure is a major challenge.

The upkeep of the basic infrastructure of the field station is another concern. Buildings decay unless well-maintained. Electricity generators can fail. Access roads erode and suffer occasional land slides. All kinds of domestic equipment wear out. Many field stations have peak visitor loads at certain times that strain all resources, especially the available electricity and water supplies.

The lucky field stations are those with secure parent organisations and long-term partnerships with both national and other country organisations. The support given by scientific organisations such as the Royal Society (London, UK) and the Smithsonian Institution (USA) has made a great difference to some field stations. In other cases individual universities or research organisations have consistently run, managed or supported particular field stations. Examples mentioned at the workshop included the involvement formerly of the Natural History Museum (London) and currently of the Royal Botanic Gardens Edinburgh in the Las Cuevas field station in Belize and the long-term research and support of Harvard University and the University of New Mexico at Makerere University's Kibale Field Station in Uganda.

The need to ensure adequate income means that field stations often have to accommodate student field parties or eco-tourist groups. The latter can be profitable but good management is required to avoid any potential conflicts of interest between tourists and scientists. Having areas of forest which are available for general access, areas which are strictly for scientific work only, and yet others which remain undisturbed can help.

Local capacity building for field station staff is important. Field assistants and rangers usually have immense local knowledge that is crucial for the success of projects in the forest. However, they can also acquire high level skills in managing instruments, laboratory analyses and computation, given appropriate opportunities. Graduate assistants are stimulated by chances to gain higher degrees through participation in research projects. Technicians and rangers benefit by exchanges of ideas with counterparts from other field stations. Field stations science co-ordinators and field station managers similarly gain from interchanges with counterparts elsewhere. The workshop showed that managers with some 20 years experience frequently had not had many opportunities (if any) to learn about good practice in other field stations.

Information shared at the workshop

Participants learnt from each other about the existence of lists of tropical field stations, but also noted the many individually successful field stations were not associated with any of the existing networks.

Young researchers, both from field station host countries and from research teams in other countries can gain a lot from international projects which give them opportunities to visit tropical field stations and projects in other regions an countries.

Many kinds of engagement with local communities exist. The best ensure that local community members have a role and a stake in field stations, not only in terms of employment opportunities, but also in being part of research activities and station advisory bodies.

Field stations can influence commercial forestry practices, promoting reduced impact logging, encouraging sustainable timber production and the use of non-timber products. Successful projects have involved close partnership with commercial forestry operators, especially in using techniques such as enrichment planting to assist regeneration after selective harvesting as part of exercises to offset carbon emissions.

Field station staff and former research students often gain successful employment in other forest related management, conservation and tourism activities. The capacity building experiences while working at the field station enhances their ability to gain work elsewhere.

Suggestions for the future development of interaction between Commonwealth field stations

Six suggestions were discussed without any particular emphasis on any of them. Participants felt that all options should be given further thought and additional possibilities should be explored. Some voices expressed caution about setting up another organisation. The suggestions were:

1. Individual field stations should assess the feasibility of linking to existing networks.
2. Commonwealth action should be coupled to existing organisations such as the Organisation for Tropical Studies.
3. A virtual network linking field stations could be established using the internet.
4. A pre-conference meeting on tropical field stations could be convened immediately prior to the next Commonwealth Forestry Conference.
5. A workshop for field station managers, community leaders and host country field station senior scientists could be held at an internationally accessible field station.
6. A specialist group on tropical field stations could be developed within an existing Commonwealth organisation.
7. Eventually, it could be possible to establish a new association for Commonwealth field stations, although it might be more advisable to make any such organisation open to all countries. There may be value in an association for providing mutual support and advice when a station finds that its formal mandate and the desires of the host government are opposed. What is the role of a station's management and Board when a project's scientific findings directly contradict government policies or practices, or when a government directly opposes the start or continuation of research which could be politically embarrassing although scientifically important?

The few people from tropical field stations present were highly enthusiastic about greater opportunities to meet and learn from each other. At the workshop they discussed problems of mutual

concern informally and made ad hoc plans for continued contact. Dr. Waidi Sinun of Yayasan Sabah, which owns and manages three tropical rainforest field stations, Danum Valley, Maliau Basin and Imbak Canyon, in Sabah, Malaysia, offered to host a meeting for field station managers at Danum Valley.

Background to the Workshop and Acknowledgments

The Commonwealth Human Ecology Council (CHEC) played a major role in the establishment of the Iwokrama project in 1989-90, particularly through meetings with the then Guyana Premier, Desmond Hoyte. A 2002 Big Lottery grant to CHEC and Pro-Natura (UK,) supported a two year Bina Hill Training Project for Amerindians in the Iwokrama Rainforest led by Dr. Norma Bubier. In 1986, Professor Ian Douglas set up a long-term hydrology project at the Danum Valley Field Centre, Sabah, which is still training local scientists. The Commonwealth Foundation, which has greatly assisted Iwokrama developments, has supported this workshop financially. CHEC thanks the Foundation for this generous help and Dr. Mark Collins, Director of the Foundation, for his personal interest in the workshop. CHEC also thanks the Very Reverend Graham Forbes, Provost, St. Mary's Cathedral, for the use of Walpole Hall and Sarah Grotrian for all her help with arrangements at the Hall. CHEC also thanks Eleanor Morris for organising and leading a fascinating walk through the private New Town Gardens overlooking the Water of Leith following the sessions on June 29th.

The Commonwealth Foundation is an intergovernmental organisation, funded principally by Commonwealth governments, and guided by Commonwealth values and priorities. Its mandate is to work with civil society to make their organisations stronger, so they are in a better position to support citizens and governments in the areas of: culture, governance and democracy, human development, and communities and livelihoods. www.commonwealthfoundation.com.

OTHER NEWS FROM CHEC

Commonwealth Fisheries Programme

CHEC has made a major contribution to the grassroots understanding of the problems faced by small-scale fishing communities in Commonwealth countries, including Belize, Sierra Leone, South Africa and Mozambique. For further information please visit the Programme's website: www.commonwealthfisheries.org. A more detailed report on the programme will be included in CHEC's Annual Report for 2009.

Gender mainstreaming in Integrated Water Resources Development in the Lake Victoria Basin, East Africa

A third workshop, supported by a further grant from the Commonwealth Foundation will be held in Kampala, Uganda late in 2010. The workshop will examine the progress made in Uganda since the first workshop in 2009 and will aim to bring contributors from other countries in the basin. Patricia Kabatabazi, the co-ordinator of the workshops has recently received further training which she will pass on to participants.

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