

May 7, 1993

PROJECT DOCUMENT

Title: Global Change System for Analysis, Research and Training (START)

Project Number: GLO/92/G31/C/1G/31

Amount: UNDP/GEF: US \$ 4,093,720

Duration: 44 months

Sector: Environment (200)

Sub-Sector: Environmental Assessment and Monitoring (203)

Executing Agency: Office for Project Services (OPS)

Starting Date: May 1993

UNDP & Other cost-sharing	
UNDP/GEF	US\$ 4,093,720
Govt. or third-part cost-sharing	US\$ NIL
UNDP & cost-sharing	
Total	US\$ 4,093,720

Brief description: Because this is an inter-regional project, assessing the environmental policy framework, which varies from country to country, is complex. Nevertheless, the climate change issue is now a top priority of the international community, and practically all countries have been drawn into it. START has been developed to provide the framework for regional collaboration on key scientific issues related to global change. It will link up regional efforts with the three major international scientific programmes IGBP, HDP and WCRP. The project will help countries in the two priority regions improve their knowledge of climate change and its potential local and regional impacts. It will ensure the involvement of the scientific community in the regions in the international research efforts developed to decrease scientific uncertainty in relation to global warming. Most importantly, it will provide the governments concerned with the tools to assess the potential implications of climate change for their environmental and resource management policies. It will provide them with internal capability to evaluate options in relation to negotiation and implementation of potential future global change conventions.

On behalf of: _____ Signature _____ Name/title _____ Date _____

Executing Agency: _____ Assistant Administrator _____ and Director OPS _____ 5/15/93

UNDP _____ 5/15/93

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A Context

1. *Description of subsector*1.1 Introduction

Over the past several years, global environmental problems have begun to occupy the forefront in the socio-political discussions. This was clearly evident in the preparatory work leading up to the United Nations Conference on Environment and Development (June 1992), at which time many nations signed a Framework Convention on Climate Change and a Convention on Biodiversity. In addition, the challenge to all nations in the area of environment and development was specified in the Agenda 21.

The perception that environmental problems have global dimensions originated in increased scientific understanding of the global Earth system and long-term monitoring initiated by the science community (e.g., the Mauna Loa carbon dioxide monitoring station). Within ten years of the first major scientific assessment of the greenhouse gas problem (SCOPE Report 29 discussed at the UN Conference in Villach in 1985) a Framework Convention on Climate Change (FCCC) has been promulgated. To address the challenge posed by the scientific report presented at Villach, the Intergovernmental Panel on Climate Change (IPCC) was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO). The first IPCC assessment published in 1990, explicitly devoted a chapter on the research needed to reduce the scientific uncertainties. The need for further research on global climate change issues was already mentioned in a UN General Assembly resolution from 1989 (44/207), in which all countries were asked to participate fully in the World Climate Programme (WCP, of which the World Climate Research Programme, WCRP, is a part), and the International Geosphere-Biosphere Programme, (IGBP).

The IGBP, WCRP and Human Dimensions of Global Environmental Change Programme (HDP) collectively represent the concerted world-wide effort by the science community to understand the functioning of the global system, human activities and impacts that will change the global environment, and the consequences this will have for the sustainable development of the biosphere. These programmes have now been implemented to a large extent in an unprecedented and concerted international, scientific collaboration that is under way. However, during this process, it has become evident that the causes and consequences of global environmental change, although global in nature, must be investigated and interpreted in regional context in order to ensure not only a global coverage of the research effort, but also to enable interpretation of results into a regional context that is meaningful for national decision makers. It is in this specific

regard that the IIGD, in cooperation with the WCRP and the HDP, have promulgated a focused effort to enhance regional indigenous capacity for conducting regional research relevant to the global research programmes.

START (Global Change System for Analysis, Research and Training) is the acronym for a system of interconnected regional research networks being developed by the IGBP, in association with the WCRP; ICSU; the International Oceanographic Commission (IOC) of the United Nations Educational, Scientific and Cultural Organization (Unesco); the World Meteorological Organization (WMO); and the HDP of the International Social Science Council (ISSC).

The fundamental purpose of a system of networked regional research centres and sites is to promote needed research on the regional origins and impacts of global environmental changes such as global warming, and to integrate these regional networks into a global system for analysis, research and training. START is the international scientific community's response to the needs for regional research with a global scientific perspective and the development of competence and consensus on scientific issues worldwide. It is administered by the IGBP START Standing Committee, which includes representatives of WCRP and HDP. The relative role of the different partners in research, assessment and policy at the international and regional levels is shown schematically in Fig. 1.

START will be a world-encompassing system of Regional Research Networks (RRNs), each of which includes at least one Regional Research Centre (RRC) and a number of Regional Research Sites (RRSs). Each of the RRCs serves as the information centre for the RRN, with additional coordination functions both within and between the region. A major function of the RRC is to provide a multidisciplinary setting within which results from various disciplines concerned with global change phenomena can be synthesized in a framework that is policy relevant. Thus, by necessity this synthetic function will include both natural and social sciences aspects. The RRCs will also have access to regional and global data bases that are necessary for analyzing both the contribution of the regions to global change phenomena as well as the impacts of global changes within the regions. The RRSs are institutes in the region with specialized expertise that allows them to carry out research on important components of the global change research programmes. Both RRCs and RRSs will also host training courses and provide foci for capacity building in the region.

Within START, 13 regions have been identified covering the globe. All of these biogeographic regions are important in terms of global change because each is distinctive, and only together can they provide a complete representation of environmental changes in a global context. Priority has been given to the development of Regional Research networks in regions covering primarily developing countries. Considering the combined factors of sensitivity to global and climatic change, scientific unknowns, and the existence

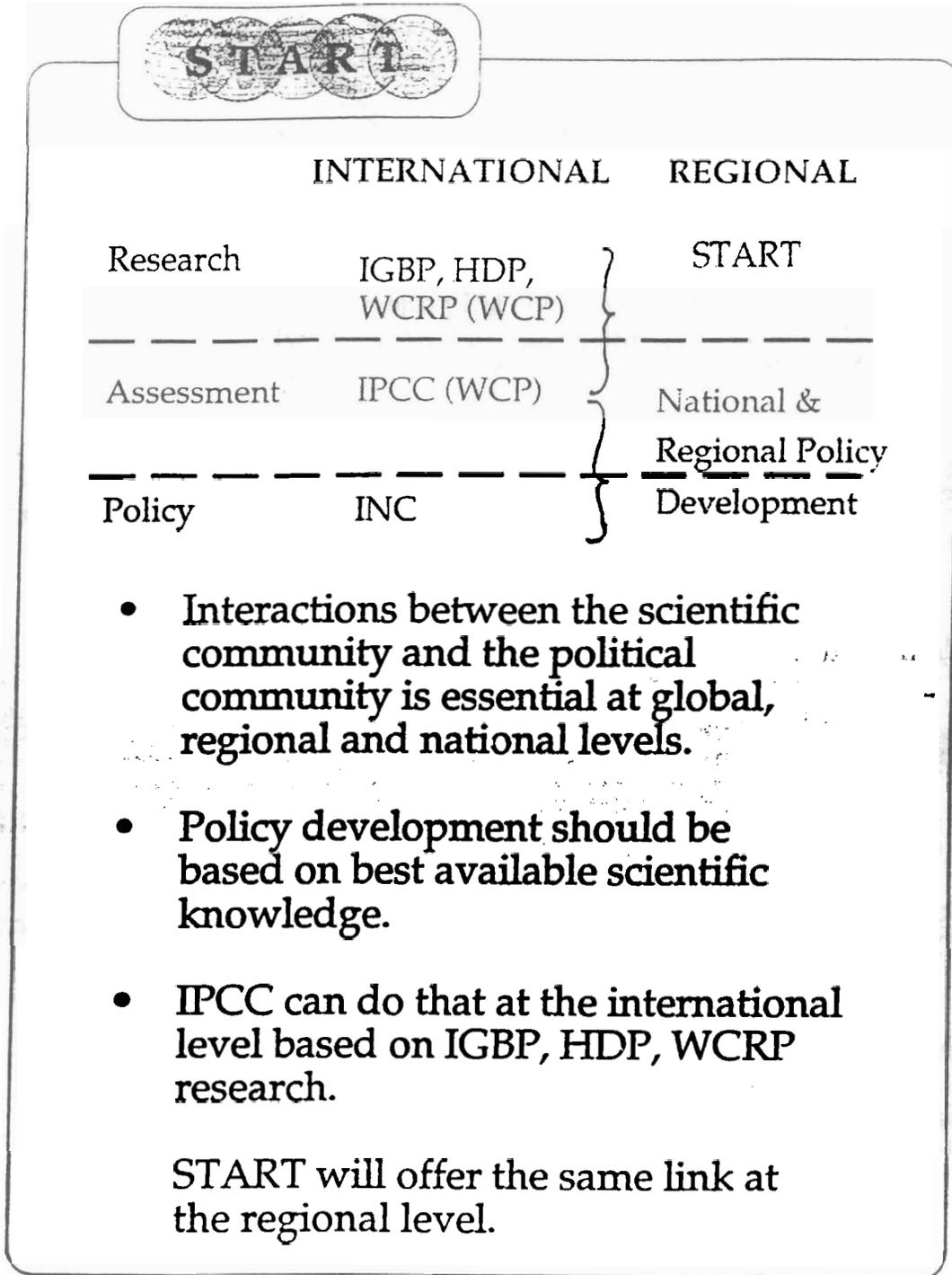


Figure 1. Relative roles of partners in global change research, assessment and policy arena at international, regional and national levels.

of available infrastructure, three regions have been identified as of highest, immediate priority for assistance in establishing START RRNs: Equatorial South America, Northern Africa and the Tropical Asian Monsoon region.

The project brief submitted to GEF from IGBP requested initial support for activities in all three priority regions. This proposal outlines initial activities to be carried out in the NAF and TAM regions. Equatorial South America is covered by the regional networking activities of the Inter-American Institute for Global Change Research (IAI), and a separate proposal from the IAI member countries has been approved by UNDP (RLA/92/G34). This IAI project will be executed in collaboration with this project, and the mechanisms are described elsewhere in the project document (Section 4.2.3).

In addition to the regional activities covered by this proposal, the following list is a synopsis of all other current activities undertaken by the International START Secretariat to implement a fully global network of networks (the regions are those identified in the original START plan: IGBP Report 15, 1991):

ANT Antarctica

Plans for a START network for Antarctica is being developed by ICSU's Scientific Committee for Antarctic Research (SCAR).

ART Arctic

Networking needs for this region are under discussion by the International Arctic Science Committee (IASC).

CAA Central Arid Asia

Discussions have been initiated with the Academy of Sciences in Mongolia and the Siberian branch of the Russian Academy of Sciences. Further consultations are necessary.

CAR Caribbean

ESA Equatorial South America

TSA Temperate South America

These three regions are covered by the Inter-American Institute for Global Change Research (IAI), which has been developed following a US initiative. At the current time, 12 nations in the Americas have decided to take part in the IAI. Initial support for the IAI effort is through the parallel UNDP/GEF project with the IAI

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(RLA/92/G34). The IAI effort, especially the scientific research agenda is being developed in collaboration with the IGBP, WCRP, and HDP.

MED Mediterranean

A MED committee will be established in early 1993. This region is also covered by a French initiative (MEDIAS), which also promotes networking activities in Sub-Saharan Africa. A Secretariat for MEDIAS has been established in Toulouse, France.

NAF Northern Africa

A START Regional Committee for NAF has been established to further develop networking and focused research activities in the region. This committee will meet in May 1993 to further develop the research agenda and necessary coordination mechanisms. Initial funding for this activity will be made available from GEF/UNDP through this project. A Secretariat is being established in Accra, Ghana with financial support from UNDP (GEF) and CEC. This effort is coordinated with the ENRICH initiative of CEC. Close collaboration also exists with MEDIAS.

OCE Oceania

Discussions are ongoing with Australia and New Zealand regarding their interests in promoting global change research in the region and support networking activities for OCE.

SAF Southern, Central and Eastern Africa

A START committee (SAFCOM) has been established and met for the first time in February 1993 in Malawi to plan a workshop to discuss networking arrangements in the region to be held in January 1994. The committee decided to establish an ad hoc Secretariat for SAFCOM to be located at Bunda Agricultural College, University of Malawi, Lilongwe. The next meeting will be in early June in conjunction with a meeting on "Land use, biomass burning and greenhouse gases" (Victoria Falls, Zimbabwe).

TAM Tropical Asian Monsoon Region

A Southeast Asian Regional Committee for START (SARCS) has been established and funding for initial programme activities will be received from GEF/UNDP through this project. A Secretariat has been established in Singapore, and SARCS is currently reviewing proposals for Indonesia and Thailand for the location of the

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RRC. The effort initially covers the ASEAN countries but will later be expanded to cover other neighboring countries.

A proposal from India to cover the South Asian region is being considered, and a regional workshop is planned for Bangladesh in late 1993.

TEA Temperate East Asia

A proposal from China is being considered and will be discussed at a meeting of the Academies of Sciences in the region. It is hoped to organize a regional meeting to further develop this in late 1993. This region is also included in a Japanese proposal for a Asia-Pacific Network for Global Change Research, which may develop as a network of networks for this subcomponent of the global system. A first meeting to discuss this was held at the Ministry for Foreign Affairs in Tokyo (December 1992). A second meeting is planned for June-July 1993 and the Australian government is considering hosting a science workshop to further discuss the scientific agenda in early 1994.

TNH Temperate Northern Hemisphere

Global change related research networking is being discussed within the Commission of the European Communities and a European Network for Research on Global Change (ENRICH) is being established. Further collaboration with Eastern Europe is being discussed with the CEC as well as the International Institute for Applied Systems Analysis (IIASA) and other bodies. National IGBP Committees of Russia, Poland, the Netherlands and Germany will arrange a regional meeting in June 1993 to further discuss an agenda for regional collaboration.

The following brief discussion focuses on the three components covered by this UNDP/GEF project document. The three components are Southeast Asia, Northern Africa, and the Global Network of Networks for global change research, respectively.

1.2. Southeast Asia

Southeast Asia is a subregion of the larger Tropical Asian Monsoon region of START, which plays an important role in the functioning of the global system, as it is a major source of biogenic trace gases as well as thermal energy to the global atmosphere. This very densely populated area will be acutely sensitive to shifts in climate and sea-level. Population pressure also leads to land-use changes with important feed-backs to the global system. Such changes also profoundly affect coastal waters, which will be further impacted by sea-level rise resulting from predicted climate change.

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In order to define regional priorities for global change research, to assess the scientific capabilities and interests of nations in the region, and to develop plans for future regional collaboration, the IGBP has conducted several major regional meetings. A regional meeting for Asia was held in New Delhi (February 1991; IGBP Reports 18:1 and 18:2) with follow-up meetings in Singapore (December 1991) and Tokyo (December 1992), which defined the general priorities for global change research in Asia.

The START initiative for Southeast Asia was discussed at a meeting of scientists of ASEAN countries in Thailand during January 1992. The meeting was convened at the invitation of the Thai Minister for Science, Technology and Environment (IGBP Report 22).

As recommended by the meeting in Thailand, a Southeast Asian Regional Committee for START (SARCS) was established with participation of the six ASEAN countries (Annex 5). The committee met for the first time in Jakarta in July 1992 at which time it developed the detailed framework for Southeast Asian component of the current project document. The second meeting (Kuala Lumpur, October 1992) reviewed the draft project document and decided to present the current version to UNDP for its review and approval. A SARCS Secretariat has been established at the National University of Singapore.

The proposal to establish a global change Regional Research Network and Centre for the region has also been presented to the ASEAN Committee on Science and Technology (COST), which decided that the ASEAN COST Sub-Committee on Meteorology and Geophysics should be the focal point for further contacts.

The countries of the region are committed to address global warming issues. At the current time, the following countries have signed the Framework Convention on Climate Change (FCCC): Indonesia, Philippines, Singapore and Thailand. During the second meeting of the ASEAN Senior Officials on the Environment (ASOEN), Malaysia was requested to coordinate the ASEAN common position on FCCC, and collaboration continues throughout the region.

In addition, Indonesia, Malaysia and the Philippines are participating in an Asian Development Bank "Regional Study on Global Environmental Issues". This project is complementary to the current proposal. The ADB project will develop studies on potential country strategies to respond to climate change.

Countries in the region have set up National IGBP Committees to coordinate their participation in the international research programmes addressing global change issues. The Chairpersons of the National IGBP Committees are the members of SARCS.

NORTHERN AFRICA

Northern Africa (NAF; Africa between the Sahara and the Equator *sensu* START) is known to be extremely sensitive to inter-annual climate variability as evidenced by recent droughts and concomitant human suffering. Any shift in climate will have immediate and possibly severe consequences for the ecosystems of the region and thus the human resource base. There is a strong need to enhance scientific capacities for research on global warming and other global changes in the region. Climate and land-use changes will affect desertification processes and water resource availability. Global warming will change the conditions for crop production and affect the regional food security. These issues, and other, were discussed at a regional global change meeting for Africa in December 1992 (Niamey, Niger), and the recommendations from that workshop provided the basis for this section of the project document.

Several other initiatives in the region are relevant for this component of the project. These include the Sahara-Sahel Observatory (OSS) and the African Centre of Meteorological Applications for Development (ACMAD). A French proposal (MEDIAS) outlines networking activities in the Mediterranean (MED) and NAF regions. As many scientific issues are common to the two regions, a close collaboration between networking activities in MED and NAF are foreseen. The Northern Africa network would build on these initiatives, which have begun to establish the first components of the infrastructure required to collect and analyze data relevant to studies of global warming. The process of developing a global change Regional Research Network also for Southern Africa (SAF) was initiated at the Niamey meeting and was further promoted through a first planning meeting in Malawi in early 1993. Linkages between the RRNs of NAF and SAF will be encouraged.

A Northern Africa Planning Committee for START (NAPCS) has been established (Annex 7) with a Secretariat at the Ghana Academy of Arts and Sciences.

1.4. A Global Network of Networks

The nature of global change research is such that, even though the activities contemplated under the START concept are of a regional nature, for they involve coordinated gathering, processing and analyses of data (and training) for a number of countries, their full implications on global scale necessitate consideration of activities of similar regional efforts elsewhere in the world. As a result, there is a need for global level of coordination between all regional research efforts so that truly global syntheses can be achieved.

The START concept implicitly involves intra- as well as inter-regional collaboration and entails the establishment of a world encompassing system of RRNs. Intra-regional collaboration is one of the specific functions of an RRN. It

order to ensure that inter-RRN collaboration on cross-cutting issues such as communication linkages, facilitation of data exchange and management, etc., occurs on systematic and regular basis, it is necessary to endow a specific responsibility to a centralized organization, i.e., the International START Secretariat, to carry out necessary functions pertinent to a global network of RRNs. Past experience with such "global network of networks" functions, such as that carried out by the Consultative Group on International Agricultural Research (CGIAR), has shown that inter-regional coordination and integration ensures that overall research objectives at global levels are adequately met. Given the basis for START within the international global change research programmes (IGBP, HDP, and WCRP), it is logical that the International START Secretariat serve the functions of a global network of networks.

In this regard, initial priorities in developing the START global network of networks covering all START regions will be given to regions with primarily developing countries. Eventually, however, networking will be necessary in all regions. To assess the capabilities and interests of each region, the IGBP over the last four years has conducted several regional meetings with scientists from less-developed countries. These meetings have been held in Mbabane, Swaziland (1988); Douala, Cameroon (1989), São José dos Campos, Brazil (1990); Lomé, Togo (1990); Niamey, Niger (1990), New Delhi, India (1991), Singapore (1991), Chiang Mai, Thailand (1992), Niamey, Niger (1992) and Tokyo, Japan (1992).

In each region, the priorities for scientific research activities will be based on the three major global change research programmes (HDP, IGBP, WCRP), although certain aspects of primarily regional importance may also be included. Through the core projects of the programmes, activities will be coordinated world wide. Through START, a regional focus will be developed that addresses how the regions contribute to global change processes and how global changes will affect the regions. Thus, the HDP, IGBP and WCRP provide the international scientific context for the START effort (Fig. 2), whereas national plans for global change research are developed by the National IGBP Committees (Annex 10). Each region sets its own scientific priorities from within the framework of the overall components of the three international scientific research programmes (Fig. 3). In addition, certain activities coordinated within the Regional Research Networks will be region-specific, without counterpart in the global programmes, but this proportion will be a small component of the overall activities in order to achieve coherence within the global network of networks.

The global set of regional networks will explicitly build the capacity of the scientific communities in all regions of the world to be involved in all aspects of research planning, project implementation and research assessment. The importance of START for promoting capacity building was presented to the 8th plenary meeting of the Intergovernmental Panel on Climate Change (IPCC; November 1992). It is hoped that START RRNs can contribute directly not only to the research programmes but also to the scientific assessments of the IPCC process.

For example, the RRNs may play an important role in supporting country studies greenhouse gas sources and sinks and scientific assessments of the effects of global change phenomena. Discussions are ongoing with the IPCC Working Group I Secretariat to work out the details of collaboration on assessment related regional efforts of the IPCC, including training. In addition, a memorandum-of-understanding is being worked out between UNITAR and START, through which the START networks will participate in the training programmes planned by UNITAR in response to the needs outlined in the FCCC.

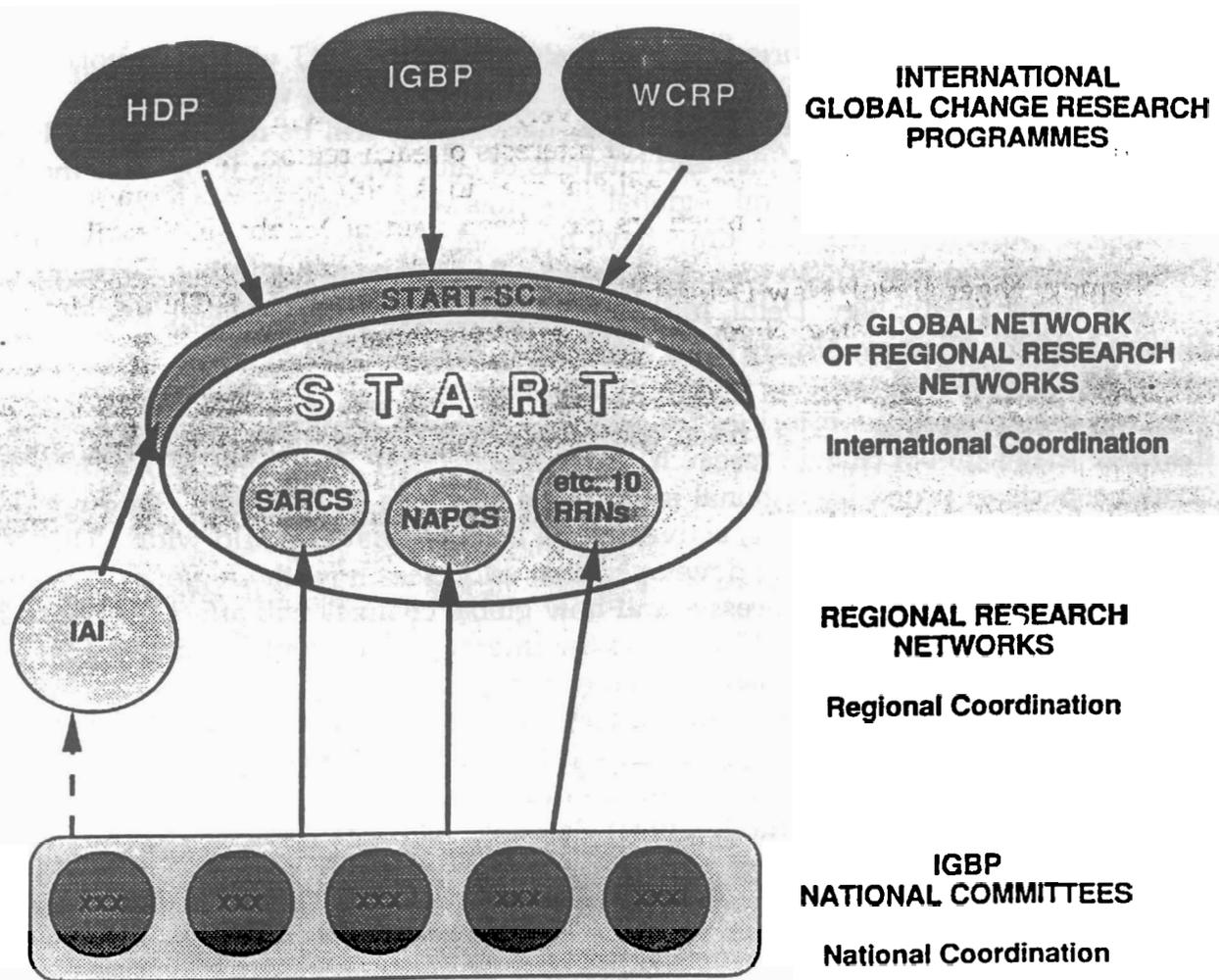


Figure 2. Coordination roles of START and related international, regional and national organizations.



Global Priorities

	I G A C	J G O F S	B A H C	L O I C Z	G C T E	P A G E S	H D P	W C R P	P R I O R I T I E S R E G I O N A L
R		X				X	X	X	X
e	X	X				X	X	X	X
g			X		X	X	X		X
i				X		X	X		X
o	X	X	X		X	X	X	X	X
n	X	X	X	X	X	X	X	X	X
a	X		X	X	X	X	X	X	X
p		X		X		X	X	X	X
r	X	X		X	X	X	X		X
i	X	X		X	X		X	X	X
t			X	X	X	X	X		X
e	X	X	X	X	X		X		X
s	X		X		X	X	X	X	X

Figure-3. Schematic representation of the international dimension for global change research and the regional dimension selecting priorities based on regional importance, scientific preparedness and willingness of the scientific community to collaborate. Priorities vary between regions but as priorities are set within the overall international framework, a coherent global network of networks will be developed.

2. Institutional framework

The UN General Assembly has recommended that governments "increase their activities in support of the World Climate Programme and the International Geosphere-Biosphere Programme." It further recommended that "the international community supports efforts by developing countries to participate in these scientific activities" (UNGA resolution 44/207, 1989). The need to involve scientists from developing countries in the IGBP was also stressed in the report of the Special Committee on the Participation of Developing Countries of the Intergovernmental Panel on Climate Change (IPCC of WMO and the United Nations Environment Programme, UNEP).

The technical session of the Second World Climate Conference (SWCC, 1990) called for "a special initiative (that) would create a network of regional interdisciplinary research centres, located primarily in developing countries, and focusing on all the natural sciences, social sciences and engineering disciplines required to support fully integrated studies of global change and its impacts and policy responses ... and (to) study the interaction of regional and global policies". In addition, a special working group on developing countries at the SWCC stressed the need to ensure the full participation of scientists and policy makers from developing countries in all aspects of global change research, assessment and policy development.

The development of START addresses such perceived needs and has been fully supported and encouraged by the UNEP Governing Council in its decision 16/36 (May 1991). *Inter alia*, the Council (i) "Welcomes the initiative of the International Geosphere-Biosphere Programme to address regional problems of global importance through its Global Change System for Analysis, Research and Training (START)"; and (ii) "Requests the Executive Director to provide, within available resources, support to the International Geosphere-Biosphere Programme regional research centres and networks, which should be planned and implemented in conjunction with the relevant World Climate Programme activities."

The international science community has decided to address the challenge of reducing the scientific uncertainties in relation to global change through the World Climate Research Programme (WCRP, since 1980), the International Geosphere-Biosphere Programme (IGBP, since 1986) and the evolving Human Dimensions of Global Environmental Change Programme (HDP, since 1990). The IGBP and WCRP have been recognized by the United Nations General Assembly and the Intergovernmental Panel on Climate Change (IPCC) as the scientific component in the international efforts to address global change issues.

The planning and coordination for the IGBP is the responsibility of the Scientific Committee for the IGBP (SC-IGBP) appointed by the ICSU Executive Board. The IGBP Secretariat is located at the Royal Swedish Academy of Sciences in

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Stockholm, Sweden. The Joint Scientific Committee (JSC), appointed by ICSU, WMO and IOC, performs a similar function for the WCRP. The WCRP Secretariat is located at WMO, Geneva, Switzerland. The Standing Committee for the HDP is appointed by the ISSC with a secretariat in Barcelona, Spain. Coordination and joint planning between the three programmes is carried out (i) with the chairpersons of JSC and SC-HDP being ex officio members of the SC-IGBP, (ii) joint committees and working groups for common projects or activities, (iii) discussions on financing within the International Group of Funding Agencies (IGFA) for Global Change Research, and (iv) through collaboration in developing regional programming and networking through START.

Funding for international research is primarily the responsibility of the participating nations. To facilitate planning and coordination of the national funding processes, an International Group of Funding Agencies for Global Change Research (IGFA) has been established. Membership of IGFA comprises the major countries funding global change research in the context of HDP, IGBP, and WCRP. As an example, it is estimated that the annual expenditure for IGBP research is close to US\$ 1,000 million. Coordination for this research is supported at the international level by the IGBP Secretariat (\$2 million needed per year) and international Core Project Offices (annual cost about \$5 million including the IGBP-DIS and START Offices). When and if the planned Global Climate Observing System (GCOS) and its companion programmes the Global Ocean Observing System (GOOS) and the Global Terrestrial Observing System (GTOS) become fully operational, the cost for world-wide global change research effort will be between US\$ 1 and US\$ 5 billion.

In comparison with this level of expenditure at the national and international levels, the expected financial resources for fully established and operational Regional Research Networks and Centres are relatively small. It is estimated that each RRN would need about US\$ 5-10 million in annual operating funds. This funding is primarily expected to come from the participating nations. However, to support the needs of the developing countries/regions, discussions are ongoing with several donor countries. The funding situation will thus vary between the different regions. Therefore, currently the establishment of a mechanism for funding the networks in a coordinated way is not envisaged as is the case, for example, for the centres under the Consultative Group for International Agricultural Research (CGIAR). While the regional research and networking effort being undertaken by START needs to be sustained over long periods, it should be stressed that the effort discussed in this project document is relatively self-contained in that it will result in considerably increased collaboration regionally as well as internationally and it will produce results that will be of importance for the continued IPCC process at the international level as well as the national planning in relation to IPCC and FCCC. Moreover, it will result in considerable enhancement of regional scientific capability and infrastructure.

The responsibility for promoting and planning START rests with the START Standing Committee (START-SC) appointed by the SC-IGBP in consultation with the JSC for WCRP and the Standing Committee for HDP. The START-SC also serves as an informal forum for discussions between governmental (e.g., IAI) and non-governmental (START) initiatives to ensure complementarity of the linkages of developing regional activities to the international programmes, as well as to foster inter-regional collaboration. The composition of the START-SC is given in Annex 7.

3. *Prior or ongoing assistance*

Most nations are currently involved in global change research, assessments as components of, for example, the activities within the Intergovernmental Panel on Climate Change (IPCC) and negotiations in connection with the Framework Convention on Climate Change (FCCC). This project presents a new approach to addressing global change issues in a regional context through development of a global START concept and catalytic activities in two priority regions.

B. Project justification

1. *Problem to be addressed: the present situation*

Governments will face decisions about whether the risks posed by global change warrant potentially costly policy responses, and if so, which responses will be feasible and effective. Governments are organizing themselves to face these decisions in a variety of local, regional and international bodies, and they are turning to the scientific community for information through specialized organizations such as the IPCC, which was established to interpret the results of basic research on climate change and its impacts into policy-relevant terms. This project seeks to develop needed information by promoting research which focuses on the *regional* origins and implications of global warming and related environmental changes. This research will provide a basis for understanding regional contributions to the anthropogenic forcing of global cycles, the impact of global changes on the regions, the options for reducing local and regional contributions to these environmental stresses, and potential ways of adapting to those environmental changes that may now be inevitable.

The scientific community, through the mechanisms of the IGBP, the WCRP and the emerging research framework of the HDP, has identified a set of research questions about critical unknowns related to global warming and other global changes. The need for further research was outlined in the report from IPCC Working Group 1 in 1990, and the core projects of the international research programmes specifically address the identified critical unknowns.

1.1. The International Geosphere-Biosphere Programme: A Study of Global Change (IGBP)

The planning for the IGBP was started in 1987 with the following objective: "To describe and understand the interactive physical, chemical and biological processes that regulate the total Earth system, the unique environment that it provides for life, the changes that are occurring in this system, and the manner in which they are influenced by human activities". The specific objectives of the IGBP, and the way they could be achieved, were developed by the international scientific community. The research strategy for the next decade was published in 1990, and most components are now underway. Priorities and realistic goals are essential for a global programme covering diverse scientific disciplines. Six critical overarching questions were formulated to assist in project definition and design. These focus on environmental systems and processes that are likely to have greatest the worldwide significance, on time scales of decades to centuries.

The questions and the IGBP core projects that have been defined to answer the specific questions are as follows:

- How is the chemistry of the global atmosphere regulated and what is the role of biological processes in producing and consuming trace gases?
The International Global Atmospheric Chemistry Project (IGAC)
- How do ocean biogeochemical processes influence and respond to climate change?
The Joint Global Ocean Flux Study (JGOFS)
- How do changes in land use affect the resources of the coastal zones and how do changes in sea level and climate alter coastal ecosystems?
Land-Ocean Interactions in the Coastal Zone (LOICZ)
- How does vegetation interact with physical processes of the hydrological cycle?
Biospheric Aspects of the Hydrological Cycle (BAHC)

How will global change affect terrestrial ecosystems?

Global Change and Terrestrial Ecosystems (GCTE)

• What significant climatic and environmental changes have occurred in the past and what were their causes?

Past Global Changes (PAGES)

1.2. World Climate Research Programme (WCRP).

The WCRP was established in 1979 as a joint undertaking of the ICSU and the WMO, to determine to what extent climate can be predicted and the extent of human influence on climate. In 1991, this collaboration was extended to include Unesco's International Oceanographic Commission (IOC). The objective of the WCRP is to provide a quantitative understanding of climate and predictions of global and regional climate changes on all time scales. Achieving this objective requires quantitative understanding of the physical climate system, constituted by four major components: the global atmosphere, the world ocean, the cryosphere, and the land surface. The WCRP has instituted the following three major projects to investigate the climate change mechanisms that can be studied within a subset of the overall climate system:

- (i) The study of Tropical Ocean and Global Atmosphere (TOGA) interactions, which are the basis for the principal mode of climatic variation from year to year, namely the Southern Oscillation and the associated El Niño phenomenon (ENSO). Based upon the observational and theoretical effort so far in this core project, the

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WCRP is now promoting development of a focused international effort to provide integrated predictions of seasonal climate variability in key regions being affected by the ENSO phenomenon. As a follow up to the TOGA program, the WCRP is in advanced planning stages for instituting a project on Climate Variability and Predictability (CLIVAR).

(ii) The Global Energy and Water Cycle Experiment (GEWEX) to study, model and predict the transport and exchanges of radiation, heat and water within the atmosphere and the earth surface, as well as the impact of climate change on global and regional rainfall regimes.

(iii) The World Ocean Circulation Experiment (WOCE) to provide, for the first time, almost simultaneous observations of all oceans, as a basis for the development of realistic mathematical models of the global ocean circulation and heat transport, similar in principle to those which exist for the atmosphere.

In addition, the WCRP is in advanced planning stage for instituting a project on the Arctic (Arctic Climate System, ACSYS).

1.3. Human Dimensions of Global Environmental Change Programme (HDP)

The HDP was launched in November 1990 at the 18th General Assembly of the ISSC. HDP's framework for research identifies the following seven broad areas for research: (1) The Social Dimensions of Resource Use; (2) Perception and Assessment of Global Environmental Conditions and Change; (3) Impacts of Local, National, and International Social, Economic, and Political Structures and Institutions; (4) Land Use; (5) Energy Production and Consumption; (6) Industrial Growth; and (7) Environmental Security and Sustainable Development. The first three topics deal with the fundamental social science research issues in the human dimensions of global change. The third through the sixth topics cover the proximate anthropogenic causes of global change. The final topic deals with the impacts of global change and strategies to mitigate or adapt to it. Current active projects of the HDP include:

(i) Land Use/Land Cover Change, a project in collaboration with the IGBP designed to answer specific questions such as how the land cover has been changed by human use over the past 300 years; how the land use/land cover will change from the present to the middle of the next century; what the major human causes of land use change are in different spatial and temporal contexts; and how global environmental changes will affect land use and land cover.

(ii) The Social Dimensions of Resource Use, a project focusing on the interaction among demographic change, technology, economic growth, and resource use.

(iii) Perception and Assessment of Global Environmental Conditions and Change, a project that is developing a Global Omnibus Environmental Survey (GOES) focusing on measuring environmental knowledge, attitudes, behaviors in countries across the world.

1.4. A Regional Focus

While much work remains regarding formulation and implementation of the three programmes as well as cross-programme coordination, progress is very much evident. This was clear from the discussions at the Third Scientific Advisory Council for the IGBP, held in Ensenada, Mexico (January 1993), at which time results from the three programmes were presented and discussed. However, what is lacking is a network of regional research centres which will facilitate regional participation in the core projects, thus aiding in the development of the indigenous knowledge base necessary for the formulation of sound policy options. Each centre and its related network of research sites will facilitate regional collaboration and research, with special emphasis on aspects of global environmental changes that have distinct manifestations in that region. The centres will assimilate, synthesize and interpret regional data sets for indigenous analysis and for incorporation into global-scale modeling efforts. They will also extract and interpret the components of global models relevant to their regions, and in this way provide regionally important information to resource managers and decision makers.

Building the indigenous scientific capabilities and infrastructure required to enable scientists from developing countries to participate in all aspects of planning, coordinating and implementing the necessary research on potential causes and regional impacts of global change is a major objective of this project. It is likely that without such an effort, which explicitly seeks to augment scientific capabilities and infrastructure in developing countries, scientists in these countries will mostly be involved in collecting data for research projects but will not be involved in analysis, interpretation and modeling efforts. They will thus not have the opportunity to develop the indigenous knowledge and information base needed by their own governments to formulate effective national policies. Moreover, without the significant involvement of their own scientists, developing countries could disregard research generated primarily in developed countries and hence could decide against taking policy measures to mitigate or slow down global warming impacts.

The importance of giving priority to establishing regional research centres and networks in developing countries is also clearly indicated by the need to develop national

and regional data bases of key variables related to global warming so that research and analysis can proceed. In many cases, developing countries lack the resources required to design and compile these data and to coordinate national data collection efforts so that they can become part of integrated regional and global systems. Such developments must be coordinated with other ongoing international efforts such as IGBP Data and Information Systems (IGBP-DIS), the Global Environmental Monitoring System (GEMS) and GRID of UNEP, the Global Climate Observing System (GCOS) of WMO/IOC/ICSU/UNEP, as well as with other related data/information networking being promoted through efforts of inter-governmental organizations, e.g., UNDP (Sustainable Development Network), and non-governmental organizations, e.g., Earth Council and the Consortium for International Earth Science Information Network (CIESIN).

2. *Expected end of project situation*

The project will encourage cross fertilization between the scientific and policy communities so that the knowledge developed about climate change through research can be communicated effectively to policy makers and resource managers. One of the goals of the project, **to involve the scientific community in developing countries in all aspects of research, analysis and assessment of climate change**, is in itself innovative.

Through the project:

- **Scientists in Southeast Asia will be trained in key issues related to greenhouse gases and land-use change.** Through participation in the international programmes, they will have access to the most recent results relating to global warming. Pilot projects will be started, which will continue in the framework of regional collaboration as part of the international efforts. During the project period, a Regional Research Network and Centre will be established, which would foster research of regional relevance in relation to greenhouse gases and sea level rise. Specific inputs will be provided to the ongoing IPCC evaluation process. Regional assessments will be made of opportunities and problems facing countries in the regions as consequence of continued global changes. The project will not result in policy recommendations but rather the objective, scientific assessments needed for such developments.

Current interest in global change issues and the importance of Southeast Asia will lead to an essential involvement of the scientific community in the global effort. The Regional Research Centre to be established during the project period must attract funding from the countries in the region as well as other donor countries. As the RRC and RRN will build on existing resources and not create any new major institutional mechanisms, the end-of-project situation will be capacity building, support of existing institutions and networking. The necessary funds for continuation of this work will be limited and most will be based on specific regional projects developed during the project period.

- Scientists in Africa north of the Equator will have (i) established priorities for global change research of relevance to the region, (ii) conducted research in collaboration with the three international programmes, (iii) been trained in global change science of an interdisciplinary nature, (iv) formed a network of collaborating scientists within the region, and (v) established a regional coordinating secretariat for START as well as a scientific planning committee to guide the development of a START RRN. At the end of the project, an implementation plan will be in place that analyzes the current needs and proposes solutions to solve the most important constraints. In collaboration with the CEC and other bodies, plans will be in place for the implementation of a Regional Research Network and candidate institutions will be identified that can serve the functions perceived necessary for a Northern Africa Regional Research Centre.

- The International START Secretariat will have developed efficient mechanisms for inter-regional collaboration, ensured that the regional activities are closely linked to the international research programmes as well as to the IPCC, further developed plans for regional networks in other START regions, and through the START-SC provided a forum for discussions between governmental and non-governmental initiatives to establish global change regional networks and centres. It is anticipated that at least three regional networks in developing countries will become firmly established during the period. Collaborative mechanisms will also be in place to ensure full collaboration between the networks of the North and the South as well as the East and West. Networking activities will have occurred in all 13 START regions and a permanent International START Secretariat will be in place.

3. *Target beneficiaries*

Direct recipients will be the scientific communities in the region by (i) sensitizing them to the importance of global change issues, (ii) training them in the necessary multidisciplinary work necessary to implement global change projects, (iii) helping them to formulate appropriate projects to be carried out in regional or international collaboration, (iv) assisting them in obtaining adequate technical support to carry out regional interpretation, analysis and modeling through techniques such as remote sensing and the use of Geographic Information Systems, (v) promoting collaboration between natural and social scientists on regionally relevant problem, (vi) providing them with the capability to access and manage appropriate regional data bases and initiate the establishment of required data bases that are not yet available, and (vii) promoting a dialogue between the scientific community to decision makers at both the national and regional levels.

The target beneficiaries will be national governments in the form of Ministries for Environment, Science and Education, Planning and Foreign Affairs, i.e., all those sectors that are involved in the international negotiations and the

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development of national responses to international agreements related to global warming.

4. *Project strategy and institutional arrangements*

4.1. Project strategy

So far, scientists in developing countries have only to a limited extent participated in the international efforts to deal with global change and climate warming. This was stressed both in the UN General Assembly resolution quoted in Section 2 as well as by the Special Committee on the Participation of Developing Countries of the IPCC. This project will initiate a process that will in the short term provide direct assistance both to the science community to narrow current uncertainties pertaining to global change, as well as to governmental ministries and agencies involved in current negotiations. In the long run, the project and its follow-on activities will lead to substantial capacity building in the sector through the provision of training and education to the next generation of scientists in the two regions.

Consideration has also been given to treating the project as three separate regional UNDP projects (IAI, NAF and TAM) plus a project on international coordination within a network of networks. However, as the project is ultimately global, it is necessary that the activities be seen in that perspective. Even if specific priorities will vary between regions, the overall goal is common and the scientific community is well organized at the international level for the results to be fed directly into the scientific quest for narrowing the uncertainties pertaining to global change including climate warming. Only through a truly global network of networks can this be achieved, and the International START Secretariat will provide the necessary forum to ensure linkages not only to the internationally ongoing and planned project but also to networks outside the three regions now being considered.

The current proposal covers activities in Northern Africa, Southeast Asia and the overall coordination for the START global network of networks. Even if the IAI proposal is formally separate from this, the activities will be coordinated and overall collaboration developed. This will primarily be through the IAI representation on the START Standing Committee but also through the three international research programmes that all regions participate in. It is also hoped that an IAI representative will be based at the International START Secretariat to ensure full complementarity between IAI and START and the development of collaborative activities. The approval of the IAI project document will considerably enhance global change research activities in that region and the IAI network will form an important component of a global network of networks for global change research, analysis and training.

4.2. Implementation arrangements

The UNDP Office of Project Services (OPS) will be the Executing Agency for the Project. For SARCS, project funds will be disbursed by the UNDP field offices upon request by the SARCS Secretariat and approval by OPS. For the other two components, a subcontract will be worked out with the IGBP Secretariat on behalf of the International START Secretariat. The roles of the other partners are as follows:

4.2.1. Southeast Asia

SARCS will be responsible for providing the scientific guidance to the activities in Southeast Asia. In this work they will be assisted by the SARCS Secretariat and the Project Manager (see Annexes 3 and 4). SARCS will, through the Project Manager, provide OPS with annual work plans for the activities described under the outputs and objectives.

SARCS will provide overall guidance to the Project Manager for running of the SARCS Secretariat and, through its Chairman, approve the travel plans necessary for him/her to efficiently carry out the functions as described in the terms of reference.

An interim SARCS Secretariat was established at the Industry & Technology Relations Office (INTRO) of the National University of Singapore in January 1993. The interim Secretariat will serve until such a time as a Regional Research Centre has been well established in the region and can take over the Secretariat function. During this interim period, INTRO will be contracted to perform the functions of the Project Manager and Secretariat.

SARCS will also provide to OPS proposed terms-of-reference for the consultants to be hired and propose name(s) of experts who could be contracted for the task. The SARCS Secretariat will screen the draft consultant reports to ensure that they are compatible with the tasks as outlined in the project document, work plans and terms-of-reference.

SARCS will provide OPS with the necessary background documentation and rationale for the subcontracts to be negotiated as part of the project. The SARCS Secretariat will monitor the development of the activities as specified in the subcontracts to ensure that work is progressing as defined and according to schedule. The SARCS Secretariat will be responsible for reports on work defined in the subcontracts, ensuring that they are prepared and sent to OPS.

SARCS, with the assistance of the Secretariat, will provide programme descriptions for fellowship schemes to be offered, advertise the fellowships and screen the applicants. The Secretariat will recommend to OPS which individuals

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should receive the fellowships and the programme of work in collaboration with the host institution.

The SARCS Secretariat, under the guidance of SARCS, will assist the responsible institutions to develop programmes and list of invited participants for the workshops specified in the project document. The host institutions will be responsible for reporting on the meeting through the Secretariat to OPS.

The SARCS Secretariat will work with the host institutions to develop programmes for group training, to select faculty and assist the host institution with advertising and screening of applicants.

The SARCS Secretariat will provide OPS specifications for equipment to be purchased under the project.

4.2.2. Northern Africa

The International START Secretariat will initially be responsible for developing the activities under the guidance of the Northern Africa Planning Committee for START (NAPCS).

The IGBP Secretariat at the Royal Swedish Academy of Sciences will be the subcontractor for this subcomponent of the project and will be responsible for financial and substantive reporting. These tasks will be performed by the International START Secretariat on behalf of the IGBP Secretariat.

Based upon the recommendations of the Niamey meeting, the NAPCS Secretariat will be located at the Ghana Academy of Sciences in Accra, Ghana until such a time as a permanent location has been decided on. A project manager will be appointed by START Secretariat based upon NAF/NAPCS recommendation to be responsible for the running of the office and be the focal point for the interactions between the International START Secretariat and NAPCS.

4.2.3. Inter-American Institute for Global Change (IAI)

Many activities included in the IAI project document are complementary to the ones described in the original START proposal and project brief. Discussions on the role of IAI in the global network of networks will be continued in the START Standing Committee, of which the IAI is an ex officio member, just as is the case for the Chairperson of SARCS. It is anticipated that, as further networks become linked to START, they will also be represented on the START-SC.

Specific collaborative activities will be developed between the IAI and the START projects at the meetings of the directors of regional networks as specified in this proposal. It is therefore expected that IAI's companion project to this

submissions from START would also be approved for further implementation. Of particular interest to both are large-scale phenomena which must necessarily be considered on a global basis, such as land use/land cover change, development of uniform and standardized methodologies for gathering measurements on biogeochemical fluxes on tropical ecosystems, etc. It is anticipated that training activities arranged by START will be of interest to the IAI and vice versa, and exchange of both tutors and students are envisaged. Also, electronic networking efforts will be undertaken by both IAI and START, providing further opportunities for joint activities also in this area. Further collaborative activities will be developed as the two programmes mature.

4.2.4. A global network of networks

The IGBP Secretariat at the Royal Swedish Academy of Sciences will be the subcontractor for this subcomponent of the project and will be responsible for financial and substantive reporting. These tasks will be performed by the International START Secretariat on behalf of the IGBP Secretariat. The primary role of the International START Secretariat will be to ensure that a truly global network of networks is established by enabling a forum for ongoing and active dialogue with both governmental and non-governmental bodies interested in promoting regional aspects of global change research and assessment. The START Standing Committee has proved to be an important platform for such discussions. Furthermore, the International START Secretariat has already proved to be an important catalytic mediator in bringing various regional partners together to ensure a global perspective. Given the International START Secretariat's sponsorship by the three recognized international research programmes addressing global change, it is imperative that the International START Secretariat provide the vital and necessary linkage between the regional efforts and the global programmes.

The International START Secretariat will also be the focal point for global network-wide discussions with bodies like the IPCC and UNITAR, as well as relevant major UN bodies such as UNEP, Unesco and WMO, to ensure that the START networks are being utilized as a resource by other programmes sponsored by such bodies. Current discussions with UNITAR and IPCC indicate their willingness to enable the Secretariat to spearhead such collaboration.

The inter-regional coordination will be the responsibility of the International START Secretariat. Coordination between the three regions and with other regions collaborating with the international science community on global change issues through START will also be ensured through the participation of the Directors of the current three regional networks (IAI, SARCS and NAF) in ex officio capacities at meetings of the START Standing Committee (START-SC).

The International START Secretariat will be responsible for arranging and hosting annual meetings between the directors (or equivalent) of all regional

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networks participating in START. Such meetings will be used to develop plans for inter-regional collaboration. The START Secretariat will be responsible for reporting on inter-regional collaboration as defined in the project document to OPS

The International START Secretariat will be also responsible for meetings of the START-SC. These meetings serve the crucial function of a forum for consultations between governmental and non-governmental initiatives.

The International START Secretariat would perform all necessary coordination activities and functions of networking the various RRNs. Specifically in this regard, it will take the lead in fostering the development of appropriate communication networks within and between regions.

At the advice of the RRN committees, the International START Secretariat will identify suitable scientists to be financed from this project to represent the regional efforts at meetings of the three major programmes (HDP, IGBP, WCRP). This support will be available not only to scientists involved in the activities of SARCS and NAPCS but also IAI.

The International START Secretariat will be responsible for assisting OPS with projects reviews as specified in the project document (Section H).

At the current moment, the International START Secretariat is primarily funded by CIESIN. The activities of the START Standing Committee is funded by specific nations and the IGBP.

The International START Secretariat will provide vital international coordination functions, without which it will not be possible to develop regional global change research activities that truly contribute to the global efforts. The central function is a necessity if the demands of the political community on the scientific community are to be met, i.e., to reduce the current scientific uncertainties in relation to global change in general and global warming in particular. The International START Secretariat has a unique role to play in this regard.

5. Reasons for assistance from UNDP

The funds for this project have been approved by the GEF on the basis of a project brief submitted to its Scientific and Technical Advisory Panel by the IGBP. GEF support is critical for initiating two modules of this global system of regional research centres. This project is complementary to the one submitted by the Inter-American Institute for Global Change Research, and taken together, the two projects will cover five of the START priority regions. Even though governments have expressed broad support, obtaining national contributions to develop the regional and global infrastructure for such a system is difficult in the absence of some evidence of success. GEF support will fund initial

research, training, data collection, networking and infrastructure building activities. These activities will demonstrate the practicality and salience of this system, which is essential for developing the knowledge required to reduce the uncertainties faced by governments and international institutions.

6. *Special considerations*

The project document contains an overall presentation of the objectives of the project and the general framework for the development of a global set of regional networks devoted to global change research. Included is a description of activities needed to assure coordination between the regional activities and the three major international research programmes addressing global change issues. It also describes the mechanisms for ensuring collaboration and coordination among the regions. The project will lead to considerable capacity building in relation to the scientific issues of global change phenomena. Through the project, policy relevant data will be made available at regional and national levels for use by governmental bodies involved in policy development in relation to global change. The project will provide an efficient link between national science communities and the international efforts to address global change issues.

7. *Coordination arrangements*

7.1. Southeast Asia

The Southeast Asian Regional Committee for START (SARCS; Annex 5) is responsible for the implementation of the project in the region. Representation of the IGBP and HDP on SARCS ensures close collaboration between the regional and international efforts. The Chairmanship of the committee rotates on a three-year basis. The first 3-year Chairperson will be elected at the 3rd meeting (Manila, the Philippines, May 1993). SARCS receives advice on scientific matters from its Scientific Advisory Panel (SAP; Annex 6). The terms-of-reference of the Panel are:

- (i) assist SARCS in the preparation of scientific plans and activities of regional projects (including this one)
- (ii) assist SARCS in the selection and identification of research and training
- (iii) assist SARCS in formulating training/fellowship programmes and fellowship requirements; and
- (iv) act as the advisory body on scientific matters related to the project.

An interim Secretariat for SARCS was established at the Industry & Technology Relations Office (INTRO), National University of Singapore in January 1993. The interim Secretariat will be responsible for the planning and implementation of the Regional Research Network and Centre under the direction

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of SARCS and its Chairperson, which has the ultimate responsibility for activities in the region. The location of the Secretariat is an interim solution until such a time that a Regional Research Centre becomes fully operational, when the Secretariat will move to the RRC. INTRO will be contracted to perform the functions of Project Manager and Secretariat (Annex 3 and 4) during the interim period. INTRO will thus be responsible for contacts between the region and UNDP and the International START Secretariat in relation to this portion of the project.

A survey of institutions involved in global change research in Asia is currently under way under the auspices of COSTED (Committee on Science and Technology in Developing Countries of ICSU). The SARCS members have also been charged with identifying institutions that can participate in implementing this sub-component of the project. Institutions identified in this manner, which participate in the international global change research programmes, will be evaluated by SARCS on the advice of SAP and suitable institutions will be designated as Regional Research Sites in the START network for the region.

The SARCS Secretariat will be responsible for the planning and coordination of the establishment of the Regional Research Network and Centre under the authority of the Chairman of SARCS. The Secretariat will be led by the Project Manager for the Southeast Asian component of the UNDP project.

A representative of SARCS will be invited to serve ex officio on the Standing Committee for START, thus ensuring appropriate coordination between the regional activities and those of other regions in START. It is also suggested that SARCS appoint a person to serve at the International START Secretariat as a resource person to further develop START in general as well as collaborative activities between regions in which SARCS has a particular interest.

Special attention will be given to the linkage between the natural and social sciences and the development of syntheses that are relevant within a policy framework. It is the responsibility of SARCS to set the agenda for START activities within the region but also for linkages with the relevant components of the three major global programmes.

7.2. Northern Africa

A Northern Africa Planning Committee for START (NAPCS) has recently been established (Annex 7). This committee is charged with further activities with the aim of establishing a START Regional Research Network in the region. The committee will also develop plans for interaction with the activities that are being developed in the Mediterranean (MED) and Southern African (SAF) regions. Representatives of MED and SAF will participate in NAPCS meetings in order to ensure that mutually beneficial activities, such as training workshops, are coordinated to attain maximum all around participation.

A Secretariat for NAPCS will be established in early 1993 at the Ghana Academy of Arts and Sciences, Accra, Ghana. The Secretariat will be co-located with the West African node of the ICSU Committee on Science and Technology in Developing Countries (COSTED). A full time professional will be hired by START Secretariat to be responsible for the NAPCS Secretariat, and will also serve as the person responsible for reporting on the project to OPS through the International START Secretariat.

The first meeting of NAPCS will be held in Accra in May 1993. The activities will be guided by the recommendations from the "Africa and Global Change" workshop held in Niamey, Niger in November 1992. The recommendations from the workshop will be published in the IGBP Report Series in early 1993.

7.3. A Global Network of Networks

The coordination arrangements at the inter-regional level is the primary responsibility of the International START Secretariat under the guidance of the START Standing Committee appointed by the IGBP Scientific Committee in consultation with the HDP and WCRP. Regional Research Networks will be invited to nominate an ex officio member to the START Standing Committee to provide a solid basis for inter-regional collaboration. To ensure that the international START planning will have as wide a perspective as possible, it is anticipated that the current staff will be strengthened by providing the possibilities for scientists from Asia, Africa and South-Central America to work as Programme Officers at the Secretariat. Funds are included in this project to make it possible for a scientist from Southeast Asia to spend two years at the International START Secretariat. Discussions are under way to ensure that scientists from the other regions will be offered the same possibility and thus ensure that the programme development is also consistent with the needs of the scientific communities of developing countries.

Coordination among the HDP, IGBP and WCRP in relation to the development of the international projects is through exchange of chairpersons to the steering bodies of the three programmes and joint working groups for specific projects/activities.

Coordination with other major scientific activities outside the three major global change programmes is primarily through ICSU and its International Unions and Committees and through the International Social Science Council (ISSC) in relation to social sciences. ICSU plays a special role in this regard, as it is cosponsoring the Global Climate Observing System (GCOS) with several UN agencies and was, together with UN bodies, responsible for the Second World Climate Conference. ICSU also participates in sessions of the IPCC and the INC.

Coordination between the IGBP and relevant UN activities is handled by the IGBP Intergovernmental Coordinating Committee (ICC with members from IGBP,

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UNEP, Unesco, WMO and IAEA). Close links are also established with IPCC, as evidenced by the report from IPCC Working Group 1. General coordination with the World Climate Programme is through its Coordinating Committee, with the SC-IGBP chairperson being an ex officio member of the committee.

At the national level, the IGBP has currently 54 national committees (Annex 9) that are primarily responsible for linkages between the national efforts and the international ones. It is essential that these committees are fully involved in the planning and coordination of global change research efforts at the national level. In addition, close collaboration has been established with other bodies involved in global change research such as the Commission of the European Communities, which is collaborating with the IGBP and HDP in the development of activities in Africa.

At the regional level, these arrangements vary, but include intergovernmental agreements (IAI), coordination with regional offices of Unesco and WMO (African Centre for Meteorological Applications for Development, ACMAD; and the ASEAN Specialized Meteorological Centre, ASMC) as well as UNEP, especially through GEMS and GRID. The responsibilities for such linkages rests with the regional committees and secretariats, supported by the International START Secretariat as appropriate.

8. *Counterpart support capacity*

8.1. Southeast Asia

In-kind support is currently available for the SARCS Secretariat. Offers have been received from Indonesia and Thailand for establishment of the Regional Research Centre for Southeast Asia. In-kind support is available to allow scientists to participate in global change research through projects at their universities or research institutes.

The SARCS Secretariat will tap available resources of scientific and other technical institutes in the region to implement the activities envisaged under this component.

8.2. Northern Africa

Discussions are under way with the Commission of the European Communities, which has shown considerable interest in supporting global change related research activities in Africa. The CEC will provide temporary funds for the secondment of an African scientist to be the linkage person between the emerging networks for Africa (MED, NAF, SAF) and the International START Secretariat as well as the planning process within the CEC.

The NAPCS Secretariat will tap available resources of scientific and other technical institutes in the region to implement the activities envisaged under this component.

8.3. A Global Network of Networks

The meetings of the START Standing Committee is to a large extent funded by the IGBP plus additional funding from a number of countries (currently France, Germany, Japan, Switzerland and the USA). In addition, funding for the major portion of the International START Secretariat, including core staff, office space, travel, etc., is currently provided by the Consortium for International Earth Science Information Network (CIESIN) in the USA.

Through the scientific community involved in HDP, IGBP and WCRP, the START Secretariat has a unique source of expertise upon which it can draw for the implementation of the project.

C. Development objectives

The UNCED process has identified the threat of global warming and other global change phenomena as priority issues for the 21st Century. This is particularly addressed by the Framework Convention on Climate Change but also by previous international agreements such as the Montreal Protocol for Protection of the Ozone Layer.

Through the World Commission on Environment and Development (Our Common Future) the link between development and environmental quality has been amply demonstrated. Although climate change is only one facet that governments need to take into account in developing strategies for sustainable development, it is an important one. The interconnectedness of all parts of the globe through the global climate system and processes that affect this system has been well documented. All countries contribute to changes in atmospheric composition that will lead to climate change, and all regions will be subject to changes affecting their renewable and non-renewable resource bases.

A major theme of the project is capacity building of the scientific community in developing countries to enable them to be fully involved in all scientific aspects of global change research and assessment. Such capacity building will ensure that each participating country has a cadre of scientists who understand the complex issues of Earth system science and who can help their governments with advice on current understanding and future uncertainties relating to global change phenomena.

Improved understanding of global change impacts on the natural resource bases of regions and individual countries will also help to understand global warming impacts. This is essential in developing appropriate regional strategies for sustainable development. The project will thus contribute one important input to that process on scientifically objective findings. It is up to each nation and region to decide how such information should be used in their planning processes.

D. Immediate objectives, outputs and activities

The overall project objectives are:

- To create the institutional framework necessary for the scientific community in two of the highest priority START regions (Southeast Asia and Northern Africa) to participate in all aspects of the internationally agreed upon agenda for global change research, with particular emphasis on global warming.
- To enable scientists in these regions to improve the information available about national and regional environmental changes which may cause and be caused by global warming, and thus to provide the necessary scientific assessments upon which policy options for mitigating or adapting to global warming can be developed.
- To build or augment national and regional capabilities to develop geo-referenced compatible data bases on variables relevant to global warming, such as the natural and anthropogenic emissions and uptakes of greenhouse gases; to develop a network within each region which links together national data bases of relevance for regional modeling.
- To develop specific plans for an implementation of a global network of networks for global change research and assessment. Particular attention will be given to links between the project and the parallel UNDP/GEF/IAI project (RLA/92/G34).

The above overall objectives are indicative; specific immediate objectives for each component is given in the following sections. The costs associated with each activity are discussed and reflected in the budget tabulations included at the end of this document. In this regard, it should be noted that as per OPS/UNDP guidance, the costs for the preparatory assistance subcontract awarded in 1992 are also shown in the budget tabulation. The future (i.e., 1993 through 1996) total amounts requested for each components are as per discussion between the UNDP and START personnel.

1. Southeast Asia

Immediate objective 1:

To improve estimates of greenhouse gas fluxes, especially in relation to changes in land use and land cover.

Output 1: Regional assessment of current greenhouse gas emissions based on national case studies

The focal point for output 1 will be PAGASA of the Philippines with the advice of the SARCS Scientific Advisory Panel, in close consultation with the International Global Atmospheric Chemistry (IGAC) Core Project of the IGBP and the IRRI/GEF project on methane emissions from rice paddies. National bodies responsible for inputs include the Climate Change Committee of the Indonesian Ministry for the Environment and the Thai National Committee for the IGBP. Contact points in Malaysia will be sought and Singapore may offer special expertise in the estimates of emissions from traffic and industry. At the international level, the IGAC activity on greenhouse gas inventories will be of particular importance as well as various projects to develop country studies within the IPCC (see draft report on country studies prepared by UNEP; IPCC/CST/Doc. 3).

Contacts have already been established with the UNDP's Regional Bureau for Asia and Pacific States, the GEF/UNDP/ADB Regional Study and its precursor, the ADB Regional Study related to development of least-cost greenhouse gas emission reduction plans in Asia. That study includes Indonesia, the Philippines and Thailand, which are also covered by this component. In particular, Activity 1 on "Emission Inventory" and Activity 2 on "Emission Measurement" are highly relevant to this project. Detailed analyses of progress in the three countries clearly indicate that there is no overlap between the projects. The START project focuses on the more difficult assessments of biological sources and sinks, while a major component of the UNDP/GEF/ADB project stresses the emissions from fossil fuel burning. However, considerable synergistic effects can be achieved through collaboration, as the START project will provide the necessary links to the science communities active in relevant research both regionally and internationally. The UNDP/GEF/ADB project focuses on emissions from fossil fuel, and will provide information that will be of great importance to the START project. Activities 4 on "GHG Emission Scenarios" and 5 on "National Response Strategy" of the current ADB project are important complementary activities to the START project. Representatives of the UNDP/GEF/ADB projects in the three countries within the SARCS region will be invited to attend the first meeting of the Scientific Advisory Panel (SAP) for SARCS to be held in Manila in July 1993. A representative from START or SARCS also took part in the ADB review meeting held in Bangkok in March 1993.

Activity 1 Workshop to develop appropriate methodology (Budget line 26.01)

A regional IGAC workshop will be convened in the Philippines in 1993 to discuss appropriate methodologies for assessing greenhouse gas emissions based on IPCC/OECD guidelines. The workshop will base the discussions on reviews of national emission inventories developed by the participating countries (currently Indonesia, the Philippines, Thailand) with particular emphasis on the biogenic sources/sinks of the gases. The workshop will develop plans for assessments of sources/sinks in the participating countries. Collaboration is also envisaged with the IPCC Working Group 1 Secretariat.

Focal points for the national case studies will be identified. It will be ensured that persons involved in the Asian Development Bank project "Regional Study on Global Environmental Issues" will also be involved in this study. Special attention will be given to the IRRI/GEF project, and estimates on methane emissions from rice paddies will rely on results from that project. Note will be taken of the results from the IPCC meeting arranged in September 1992 by the US government, at which time the issue of standardized methodologies was addressed. Climate change scenarios from Activity 1.3.1 will be used as well as outputs from 1.3.2.

The workshop will include 20 participants from the region (each \$ 1000 for travel and 5 days @ \$ 150 for accommodation and per diem) and 5 experts from outside the region (each \$ 3000 for travel and 5 days @ \$ 150 for accommodation and per diem) plus incidental expenses (\$ 6250). The total cost for this activity is \$60,000.

Activity 2 Training courses for flux measurements (Budget line 25.01)

Two training courses (two weeks each) will be conducted in early 1994 and 1995 to familiarize scientists with recent flux measurement technologies. The selection of topics is the responsibility of SAP with advice from IGAC. With regard to methane fluxes from rice paddies, this will be done in collaboration with the IRRI/GEF project and an initiative by the Indian National Committee for the IGBP. Note will also be taken of a recent IAEA consultants meeting to recommend appropriate methodologies for greenhouse gas flux measurements. It should be ensured that the planning for this activity is done in close consultation with the above mentioned UNDP Regional Bureau for Asia and the Pacific States effort under GEF support and the ADB project.

Each training course will be organized for 12 participants (each \$ 1000 for travel and 12 days @ \$ 100 for accommodation and per diem). Two teachers from the region (each \$ 1000 travel and 5 days @ \$150) and three from outside the region

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each \$ 3000 travel and 5 days @ \$ 150). Incidental expenses to a total of \$ 8850. Total cost per training course would be \$50,000, yielding an overall total for the two courses of \$100,000.

Activity 3 Fellowship programme: (Budget line 31.01)

Fellowship programmes for young scientists involved in greenhouse gas studies for visits to specialized laboratories (four 6-month duration visits and four 3-month duration visits at a prorated cost of \$ 2,000 per month per visit, including travel) primarily in the region, but also at other appropriate laboratories involved in IGAC research. The receiving laboratories will be identified during the workshop (Activity 1) and it will be the responsibility for the SARCS Scientific Advisory Panel to set up an appropriate mechanism for the selection of the fellows. A total of 36 months will be available and the aim will be for an even distribution of fellowships between the four eligible countries. The total cost for this activity is \$72,000

The activity will allow for capacity building in the region but also for networking both within the region and internationally.

Activity 4 Post-doctoral programme: (Budget line 31.02)

Post-doctoral programme for five persons to each spend one year (@ \$ 48,000 p.a.) in a key IGAC laboratory outside the region. Selection of the fellows will be made by the IGAC Scientific Steering Committee, which will also identify suitable host institutions. Long-term capacity building is necessary and the collaborative partners will ensure that the post-doctoral programme is aimed at development of collaborative projects with the home institutions of the fellows. This will allow the development of strong ties and institutional twinning to address key issues relating to greenhouse gas emissions and atmospheric chemistry. This activity will thus also have long-term benefits for the RRN and the institutions from which the fellows are selected as well as for the institutions receiving the fellows. Total cost for this activity spread over 1993 through 1996 is \$240,000

Activity 5 Synthesis workshop (Budget line 26.02)

A synthesis workshop will evaluate results from the case studies and a report describing the results will be published in time for it to be utilized as an input to the next IPCC assessment, to be concluded in 1995.

The workshop will include 30 participants from the region (each \$ 1000 for travel and 5 days @ \$ 150) and 10 scientists from outside the region (each \$ 3000 for travel and 5 days @ \$ 150) plus \$ 5000 in incidental expenses. The total cost for this

Output 2: Documentation of current land-cover change, the processes responsible for land-use change and the projected changes over the next decades as a basis for assessing their importance for climate change

The focal point for this output will be the National Research Council of Thailand through Thai universities in collaboration with the Thailand Development Research Institute and the Asian Institute for Technology. Ongoing activities in the Philippines, Indonesia and Malaysia will also be necessary components of the study.

Activity 1: Workshop to develop methodologies (Budget line 26.03)

A workshop will be convened to develop methodologies for studies of land-use/land-cover change in the region. The workshop will result in recommendations for national studies in all participating countries. The work will be closely coordinated with the joint IGBP-HDP project on land-use/cover change and with relevant UN programmes and other international studies.

The workshop will include 15 participants from the region (each \$ 1000 for travel and 5 days @ \$ 150 for accommodation and per diem) and 5 experts from outside the region (each \$ 3000 for travel and 5 days @ \$ 150 for accommodation and per diem). Incidental expenses to a total of \$ 5000. The total cost for this activity is \$50,000.

Activity 2: Case-studies of land-use changes (Budget line 24.00)

Based on the recommendations from Activity 1.2.1, assessments will be made of land-use changes utilizing historical records, maps and remote sensing. Institutions with the necessary expertise will be identified in all four of the participating countries by the SARCS Scientific Advisory Panel. The institutes will be sub-contracted by OPS/UNDP to carry out the work. At least one scientists in each of the four participating institutions (to be identified at the 3rd SARCS meeting in March) will work full time for up to nearly two years (spread over 1993 through 1995) in each of the participating institutions. The activity will collaborate with GRID and other international Earth system data networks to allow access to the appropriate data bases.

The total effort of 4 scientists' effort spread over 72 months (equaling 6-man years @ \$ 36,000 per man-year for a subtotal of \$216,000 plus \$15,000 per institution for travel and contingencies of each of the four scientists for a subtotal of \$60,000) would cost \$276,000.

Activity 3: Fellowship programme (Budget line 31.03)

Fellowship programme for young scientists involved in studies of land-use/land-cover changes. The fellowships will allow for four 6-month duration visits and four 3-month duration visits at a prorated cost of \$ 3,000 per month per visit, including travel, to specialized institutions primarily in the region, but also at other appropriate laboratories involved in the IGBP/HDP land-use/land-cover change project. Selections of the fellows will be made by the SARCS Scientific Advisory Panel. This will allow for capacity building in the region but also for networking both within the region and internationally. The total cost for this activity is \$108,000

Activity 4: Equipment for GIS (Budget line 42.01)

Acquisition during 1993 to 1995 of hardware and software for Geographic Information Systems (GIS) for the four participating institutions. Four units @ \$ 40,000 per unit and software @ \$ 15,000 per institution would cost a total of \$ 220,000. The decision of the type of equipment to be acquired will be made by mid-1993.

Activity 5: Synthesis workshop and publication (Budget line 26.04)

A synthesis workshop will be convened in late 1995 to compare case study results (Activity 1.2.2) and methodological problems highlighted from the national inventories, and to plan for follow-up action regarding outreach activities and training. The consolidated results from the case studies and workshop recommendations will be published before the end of 1996.

The workshop will include 30 participants from the region (each \$ 1000 for travel and 5 days @ \$ 150) and 10 scientists from outside the region (each \$ 3000 for travel and 5 days @ \$ 150) plus \$ 5000 in incidental expenses. The total cost for this activity is \$95,000.

Output 3: Analysis of the effects of climate change on land-cover in the region.

The focal points for this output will be the ASEAN Specialized Meteorological Centre (ASMC, Singapore), the CSIRO Division of Atmospheric Research and the IGBP/GCTE Core Project Office (Canberra, Australia).

Activity 1: Tutorial course on GCMs (Budget line 25.02)

It is important that scientists involved in studying impacts of global changes understand outputs from climate models (General Circulation Models) and their constraints in providing predictions of climate change. CSIRO, in collaboration with the ASEAN Specialized Meteorological Centre (ASMC) and WCRP, will develop a tutorial course for non-meteorologists in the region to familiarize them with GCMs. The course will be organized in Mordialloc, Australia before the end of 1993. Furthermore, climate change scenarios for Southeast Asia are being developed by the CSIRO Division of Atmospheric Research, and this work will be of great benefit to the project.

Twenty participants for 15 days (travel @\$1,500, accommodation and per diem @ \$100 for 12 days) and two full time staff for two weeks each plus institutional overhead totaling \$ 26,000 yields a total cost for this activity of \$ 80,000.

Activity 2: Training course on modeling ecosystem response to global change (Budget line 25.03)

In collaboration with the IGBP Core Project Global Change and Terrestrial Ecosystems (GCTE) Core Project Office (Canberra, Australia), a training course on modeling responses of tropical ecosystems to climate change will be designed and convened in Malaysia in 1994. As a result, ecologists from the region will become further involved in GCTE project activities. This effort will help focus on land-cover change manifestations that may result as a consequence of global warming. The information will, in turn, feed-back to the greenhouse gas emission scenarios developed under 1.1.1.

Twenty participants for 15 days (travel @ \$ 1,500, accommodation and per diem @ 100 per day) plus five teachers (travel @ 3,000, accommodation and per diem @ \$ 100 per day) will cost \$ 82,500. One scientist will be employed full time for up to six months at a cost of \$ 17,500 to compile existing models and develop tutorial material. The total cost of this activity is \$100,000.

Output 4: Report on development of scenarios for future greenhouse gas emissions incorporating the potential impacts on sources and sinks of global change, land-use change, economic development, and technological innovations.

The focal point for this output will be the SARCS Secretariat.

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Activity 1: Report preparation and workshop for scientists (Budget line 31)

Based on activities 1.1.1, 1.2.2, and 1.3.2, scenarios for greenhouse gas emissions and land transformations in the region over the next 100 years under changing climate and land-use/land-cover will be prepared by a group of scientists from the region under the guidance of the SAP. The outputs of the ADB project Activity 4 should be taken note of in the detailed planning for this Activity. A report detailing the scenarios and the bases for their preparation will be circulated to scientists within and outside the region for comments and criticism. Based on their responses, a revised report will be prepared for discussion at a major workshop to prepare a report outlining scenarios. The final report will provide objective scientific assessments against which policy options can be evaluated.

One scientist will be appointed by SARCS to work full-time on the compilation for one year at a cost of \$ 36,000, reflected in the budget table under item 31.04. The workshop will include 30 participants from the region (each \$ 1000 for travel and 5 days @ \$ 150) and 10 scientists from outside the region (each \$ 3000 for travel and 5 days @ \$ 150) plus \$ 5000 in incidental expenses. The total cost for this workshop reflected in the budget tables under item 26.05 is \$ 95,000.

Activity 2: Workshop for policy makers (Budget line 34.02)

The report from Activity 1.4.1. will be disseminated to the institutes in the Regional Research Networks, as well as to relevant government bodies asking for their assessment of the policy implications of the developed scenarios. It is suggested that the organization of this Activity be carried out in collaboration with COST/ASEAN. Based on the responses, a simulation workshop for policy makers will be held to demonstrate, within the limits of the scenarios and models developed, the environmental and possible socio-economic implications of different scenarios of land-use/cover change, technological innovation, etc.

The workshop will include 20 participants from the region (each \$ 1000 for travel and 5 days @ \$ 150 for accommodation and per diem) and 5 experts from outside the region (each \$ 3000 for travel and 5 days @ \$ 150 for accommodation and per diem) plus incidental expenses (\$ 6250). The total cost for this activity is \$ 60,000.

Immediate Objective 2 :

To integrate natural-social science assessments of the impacts of sea-level rise on terrestrial and marine resources in the coastal zone.

Due to decreased level of financial support available from UNDP/GEF as compared to the original GEF decision, funding for this objective is not included in the budget of this project document, but additional funds will be sought separately. The work

plan is included to indicate another major activity that is planned as an initial priority by SARCS

The focal point for the outputs under this objective will be Indonesian Institute of Sciences (LIPI) and the National Institute for Aeronautics and Space (LAPAN) of Indonesia.

Output 1: Understanding current predictions of sea-level rise

Activity 1: It is important that the scientific community in the region becomes fully acquainted with the basis for current predictions of mean sea-level rise and that appropriate assessments are made for the regional rates of sea-level changes that can be expected. To this effect, a workshop will be organized with scientists involved in the IPCC assessment and key scientists in the region, especially those that will be involved in regional research related to the IGBP Core Project Land-Ocean Interaction in the Coastal Zone (LOICZ). Special attention will be given to the need to develop a capability to predict changes in the occurrence of extreme events. The workshop will define needs for implementing a regional monitoring network and data base in consultation with the International Oceanographic Commission (IOC).

Output 2: Effects of predicted sea-level rises

Activity 1: A consultants meeting will be convened in early 1993 to identify the data necessary for studies of land-ocean interactions including the effect of sea-level rise. The data bases must be available in a GIS format. The discussions will build on the outcome of activities 2.1.1., as well as the science plan for LOICZ, which will be available by late 1992. It is hoped that organizations such as GRID and the Consortium for International Earth Science Information Network (CIESIN) can be involved in this work. The compilation of information of existing relevant data bases will be carried out under Activity 3.1.1

Activity 2: A workshop to discuss methodologies used by the IPCC in assessment of impacts of projected sea-level rise. The meeting will agree upon an appropriate methodology for the region. Institutes will be identified as responsible for the case studies.

Activity 3: The results of the case studies will be incorporated into a regional report that can be provided as an input to the IPCC 1995 assessment of climate change and its impacts. The case studies will also identify the need for further research in both the natural and social sciences realm. The reports will be evaluated at a regional

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Immediate Objective 3:

To develop regional data bases for use in global warming studies

The focal point for this objective will be the SARCS Secretariat in collaboration with UNEP/GRID and assigned national nodes and other collaborating partners. For social sciences data, collaboration will include CIESIN. The SARCS Secretariat will develop the detailed plans for administration of these activities together with GRID and CIESIN.

Output 1: Assessment of the regional access to relevant data bases

Activity 1: Inventory of existing data bases (Budget line 23.00, 26.07)

In collaboration with GRID and other appropriate Earth science information networking organizations, an inventory of existing regional data bases of importance for studies of global warming will be completed in early 1994 by CIESIN or another appropriate organization at a cost of \$ 50,000 spread over 1993 and 1994 in equal proportions, as shown in the budget tabulation under item 20.03. Special attention will be given to the development of appropriate data bases on socio-economic factors needed for assessing future land-use changes. A workshop will be convened in mid-1994 in collaboration with IGBP-DIS and GRID to discuss priorities for development of data bases that are needed but not yet available.

The workshop will include 15 participants from the region (each \$ 1000 for travel and 5 days @ \$ 150 for accommodation and per diem) and 5 experts from outside the region (each \$ 3000 for travel and 5 days @ \$ 150 for accommodation and per diem). Incidental expenses to a total of \$ 5000. Total cost for this activity is \$50,000.

Immediate objective 4:

To develop regional capacity and strengthen existing institutions in the region through the establishment of a regional network for global change research, and lay the foundation for the creation of a regional research centre.

The focal point for this objective will be the SARCS Secretariat

Output 1: Establishment of a START Regional Research Network and Centre

Activity 1: SARCS Secretariat (Budget lines 11.01, 13.01, 15.00, 16.02, 43.00)

An interim SARCS Secretariat has been established in Singapore. This secretariat will be responsible for planning and coordination until such time that a Regional Research Centre is formally established. This is further outlined in Appendix 3 and 4. In the interim, INTRO of the National University of Singapore will be subcontracted to perform the Project Manager and Secretarial functions. The costs associated with this activity include a 42 man-month effort spread over 1993 through 1996 at a cost of \$ 210,000 for the SARCS Project Manager (budget item 11.01); a 42 man-month effort spread over 1993 through 1996 at a cost of \$ 70,000 for project secretary (budget item 13.01); SARCS Secretariat office costs of \$20,000 per year spread over the same period and costing a total of \$ 70,000 (budget line 43.00); duty travel for the SARCS Secretariat staff of \$ 12,000 per year for the same period costing a total of \$44,000 (budget line 15.00); and mission costs associated with SARCS and SAP meetings over the same period, costing \$ 40,000 per year for a total of \$ 160,000 (budget line 16.02). Thus, the total cost for this overall activity is \$534,000.

The Secretariat will be intimately involved in developing plans for the establishment of an RRC in the region. It will have the responsibility of coordinating the project activities and developing the primary links of the Regional Research Network. The secretariat, together with COSTED, will compile a directory of researchers and institutes in the region involved in global change research. The secretariat will also serve SARCS. The Secretariat will also be responsible for convening SARCS approximately twice a year and SAP once a year.

Activity 2 Establishment of an RRC (Budget lines 42.02)

Establishment of an RRC. Funds will be used to acquire certain equipment for the RRC that will make it possible for it to serve as a node for the synthesis and assessment of global change phenomena of regional importance. Thus, a workstation linked to a GIS with appropriate hardware will be included in this activity. However, most of the costs for establishing the RRC will be borne by the host country. Additional funds for the activities of the RRC will be sought from other donors. The further specifications will be discussed at the 3rd SARCS meeting in July 1993 and a decision will not be taken until the location of the RRC has been decided upon. It is hoped that this can be done before the end of 1993. The total cost for this activity is \$ 212,000 spread over 1993 through 1995, distributed as \$ 30,000 in 1993, \$ 82,000 in 1994 and \$ 100,000 in 1995, respectively.

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Output 2: Plan for the establishment of components of a communication network

Activity 1: Establish electronic communication facilities (Budget lines 11.52)

During 1994, the International START Secretariat will hire a consultant to develop plans for an efficient communication system in the region based on currently available options. The network should also link to the international science community involved in global change research and provide access to directories of data bases as well as data archives themselves. The total cost for this activity is \$50,000 in 1994.

Activity 2: Acquisition of communication hardware and software (Budget line 42.03)

The START Secretariat, in consultation with SARCS and the other RRNs within START, will determine the needs to establish adequate PC-based, electronic communication facilities, including access to electronic mail, for all participating institutions in the network. This will entail purchase of dedicated personal computers, other hardware and software for those institutions where it is not already available. The specifications will be based on the outcome of activity 4.2.1. The total cost for this activity is \$40,000 spread over 1993 through 1995.

Output 3: A global change socio-economic research agenda

Activity 1: Planning meeting and workshop (Budget line 26.08)

A planning meeting in June 1993 will lead to a workshop of key scientists from the region with a few specialists from outside the region knowledgeable about HDP. The workshop will be organized by Dr. R. M. Moss, Deputy Director of the HDP and Dr. Paul Cheung, HDP representative for Southeast Asia through the IGBP Secretariat. The workshop will result in a proposed programme of work that focuses on socio-economic issues of immediate relevance to Objectives 1 and 2. At a later stage, these proposed activities will be incorporated into the ones described above.

The workshop will include 15 participants from the region (each \$ 1000 for travel and 3 days @ \$ 150 for accommodation and per diem) and 3 experts from outside the region (each \$ 3000 for travel and 5 days @ \$ 150 for accommodation and per diem) plus incidental expenses (\$2000). The total cost for this activity is \$35,000 in 1993.

2. Northern Africa

At the meeting "Africa and Global Change" held in Niamey, Niger in November 1992, priority topics for global change research specific to Africa were delineated and constraints for active participation of African scientists in the international global change research efforts of the IGBP, WCRP and HDP were also identified.

The overall recommendations from the meeting were the:

- Need to further refine the scientific priorities outlined during the workshop in each of the following topics:
 - Desertification, deforestation and vegetation change: Impacts on and from climate change and climate-driven land-cover change, including biomass burning
 - Land use and climate change impacts on water resources, river basins and coastal systems
 - Past climate changes in Africa related to global change
 - Global change impacts on agriculture and food security
- **Need for education and training involving both graduate student fellowships and short-term grants for scientists**
- **Infrastructural support such as laboratory equipment and specialized analytical facilities**
- **Improved communications through (i) a directory of researchers involved in global change research; (ii) access to global change literature, (iii) access to global change relevant data bases, and (iv) access to an electronic communication system (e.g., INTERNET)**

The meeting decided to (i) establish a Northern Africa Planning Committee for START (NAPCS, Annex 7), (ii) establish a Secretariat at the Ghana Academy of Arts and Sciences in collaboration with the regional COSTED Secretariat, (iii) recommend the establishment of similar committees for the Mediterranean (MED) and Southern Africa (SAF) regions, (iv) recommend the secondment of an African scientist to the International START Secretariat, (v) recommend that national committees for IGBP/HDP(WCRP) be established, and (vi) identify potential individuals and institutes that may become involved in the four priority topics for research and review the institutes and their possible function as Regional Research Sites in a future Regional Research Network for NAF.

The initial funding for NAPCS will be sub-contracted to the International START Secretariat through the IGBP Secretariat at the Royal Swedish Academy of Sciences in Stockholm, Sweden.

Immediate objective 1:

To establish an ad hoc secretariat and initiate the functioning of the Northern Africa Planning Committee for START

Output 1: Terms-of-reference for NAPCS, work plan for the first year and an established ad hoc secretariat

Activity 1: NAPCS meetings

The Northern Africa Planning Committee for START (NAPCS) will have its first meeting in Accra, Ghana on 7-9 July 1993. At this meeting NAPCS, with guidance from the START Secretariat, would develop formal terms of reference for its operations; decide upon establishment of the NAPCS Secretariat in Ghana (including staffing needs) as per the Niamey meeting recommendation; develop a recommendation regarding secondment of an African scientist to work at the START Secretariat on NAF issues; decide upon participation of NAF scientists at the upcoming workshop, "African Savannas, Land Use and the Global Atmosphere" (Victoria Falls, 2-5 June 1993); initiate an assessment of individuals and institutions that may be involved in NAF priority research topics, as defined at the Niamey meeting, and develop a process for review of such institutions as regards their possible function as regional research sites in a full-fledged NAF-RRN. In this regard, NAPCS would decide upon establishment of at least four RRSs within NAF region that will deal with the scientific research priorities recommended by the Niamey meeting.

Further, NAPCS will be responsible for providing the scientific guidance for the activities in the NAF region, assisting in the development of projects related to the scientific foci, and assisting in fund raising for such regional projects.

The committee will consider how to best implement the small grants programme in conjunction with the International Foundation for Science (IFS) as proposed in the original project brief to GEF. Funds will be sought to finance a small research grants programme through the IFS in collaboration with the African Biosciences Network (ABN), to allow relevant global change research to be carried out in the region on topics identified at the meeting in Niamey. Discussions are also under way to coordinate this with a fellowship scheme established by MAB/Unesco. Some projects will be designed and implemented in collaboration with distinguished visiting researchers through an integrated programme of training and research fellowships that NAPCS will try to implement. Scientists identified as recipients of research grants and fellowships will form the important components of the global change network to be established as part of this proposal, which will later be expanded to include a full-fledged regional research centre and network for Northern Africa.

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The committee will also assist in the coordination with MED(MEDIAS) and SAF on common scientific issues in order to formulate collaborative research projects. In order to facilitate such coordination, a member from the MED region serves on the NAPCS. It is assumed that a similar appointment will be made from the SAF region, once that initiative develops further.

The Committee will also assist in developing close collaboration with other relevant UNDP and GEF activities focused on the global warming issue. In particular, the Committee would seek active collaboration, both in terms of coordinated research agenda development as well as in data and information transfer facilitation, with the UNDP Regional Bureau for Africa's GEF funded effort (4th Tanche) on greenhouse gas assessment and least-cost global warming mitigation in sub-Saharan Africa. The existing excellent communication with the UNDP Regional Bureau staff and the START Secretariat is a major plus in this regard. In addition, the Committee would consider and implement necessary coordination arrangements with other related GEF projects in the region, including the Regional West Africa Project (Control of Greenhouse Gases through Energy Efficient Building Techniques), the Benin project (Village-Based Management of Woody Savannas and Establishment of Woodlots for Carbon Sequestration), and the Sudan project (Community Based Rangeland Rehabilitation for Carbon Sequestration and Greenhouse Gas Reduction). In addition, the committee would address the modalities for incorporating relevant results from other diverse approved GEF projects under UNDP's Regional Bureau for Africa under Global Warming Mitigation related category (e.g., Greenhouse Gas Assessment and Least Cost Global Warming Mitigation in Sub-Saharan Africa).

It is expected that NAPCS will meet twice a year. Participation by twelve members including travel, accommodation and per diem, will cost ca. \$25,000 per meeting. Total cost for this activity over a two-year duration would be \$100,000.

Activity 2: Establishment of the NAPCS Secretariat

The ad hoc secretariat for NAPCS/NAF will be established no later than May 1993.

The NAPCS Secretariat, under the guidance of NAPCS, will assist the responsible institutions to develop programmes and lists of invited participants for the workshops specified in the project document. The host institutions will be responsible for reporting on the meeting through the Secretariat to the START Secretariat and OPS.

NAPCS will review candidates for Project Manager for the Secretariat, who will also be the focal point for contacts with the international START Secretariat and OPS. In addition, a secretary will be hired to assist the program manager in

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the operation of the NAPCS Secretariat. Staff remuneration (Scientific Coordinator \$25,000 pa; Secretary \$15,000 per year), and costs for the operations of the NAPCS Secretariat (\$15,000 pa) and duty travel (\$10,000 pa) would be \$33,000 for 1993, \$65,000 for 1994, and \$32,000 for 1995. The total cost for this activity for this 24-month effort for which support is requested here is \$130,000.

Immediate objective 2:

To develop science plans for priority topics and survey existing projects of relevance and available expertise within the region

Output 1: Plans for research priority within the four foci

Activity 1: Science priority development workshops

Four workshops (two in 1994 and two in 1995) will be convened to develop further the detailed plans for projects addressing the initial four priority topics. These workshops would also formulate a strategy for developing consolidated regional data bases for use in global warming studies which would be used, among other efforts, for the country studies relevant to the IPCC assessments and to the Framework Convention for Climate Change. During this process, institutes in the region will be identified that can serve as Regional Research Sites in the emerging network. Individual scientists are already being identified through a survey process initiated by the IGBP in collaboration with the Commonwealth Science Council (CSC) and the OSS. Participation of scientists from MED and SAF will be encouraged, and a few specialists from outside Africa who are knowledgeable about the international programmes will also be invited.

The planning for the workshops will initially be the responsibility of the NAPCS Secretariat in collaboration with the International START Secretariat and IGBP. Participants will be selected by a small organizing committee for each meeting, to be decided on by NAPCS at its first meeting. It is estimated that each workshop will have 12 participants from the region and three specialists from outside the region whose travel and per diem would need to be covered. Based upon an estimated cost per workshop of \$35,000, the total cost for the workshops would be \$140,000.

In addition, travel support for two NAPCS representatives and selected four NAF researchers involved in greenhouse gas emissions would be provided to attend the upcoming important workshop "African Savannas, Land Use and the Global Atmosphere" (Victoria Falls, 2-5 June 1993), where a strategy for design and implementation of a project to assess trace gas emissions from the African region is to be developed. During the meeting, a priority document will be developed.

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submission to appropriate funding agencies. It is expected that the project to be developed will provide important information to the second IPCC assessment. Estimated cost (airfare and local travel only; lodging and other subsistence expenses will be provided from sources other than the UNDP/GEF funds discussed here) for this participation would be around \$12,000.

Total cost for this activity over a two-year duration is estimated to be \$152,000.

Immediate objective 3

To develop regional electronic communications/data and information exchange network connecting various NAPCS related institutions and individual scientists

Output 1: Set up of a regional electronic communication network

Activity 1 : Establishment of Communications Facilities

An expert consultant would be retained through a sub-contract to develop an implementation strategy for electronic communication capability for the NAF RRN/. This expert would be the same as the one retained for the Southeast Asia component for a similar purpose. Estimated cost for the 5 man-month effort of the expert to develop the implementation strategy for the NAF region and to equip the NAF/NAPCS Secretariat as well as four NAF RRS sites with the necessary capability would be \$26,000.

The expert would equip and make operational minimal hardware and software connectivity at the NAF/NAPCS Secretariat and four other NAF RRSs. This communications facility would become the basis for the NAF regional data/information communications network. It is estimated that the cost of minimal connectivity, including hardware, software and incidental expenses would be around \$12,000 per node. The NAF/NAPCS Secretariat would be connected during the first year of the effort (1993). Two RRS-nodes per year (starting in 1994) would also be connected. The total cost for establishing connectivity at the five nodes (NAF/NAPCS Secretariat plus four RRSs) over a two-year duration would be \$60,000. Thus, the total cost for this activity would be \$ 86,000.



3. A Global Network of Networks (START)

Immediate objective 1:

To provide a coordination mechanism by which the regional networks become integrated components of a global network of networks

Output 1: Plans for implementing coordination between the three regions and with other emerging regional initiatives within START.

Activity 1: Secondments to the International START Secretariat

One scientist from each of the three regions will spend 1-2 years at the International START Secretariat with the charge of preparing detailed plans for collaboration between the three regions. They will further ensure that adequate links are developed between the research agendas of the regions and the international programmes. They will also be the parties primarily responsible for contacts between the International START Secretariat and the three initial priority regions IAI, SARCS and NAPCS (see Fig. 2 and 3).

Funds have been requested from the Commission of the European Communities for an African scientist to spend two years at the START Secretariat. It is hoped that the IAI can provide similar support to a scientist from Latin America. Secondments may also be expected from some of the other key regions of START and will facilitate the development of a global network of networks. This document includes salary support for a scientist from Southeast Asia. Office space, secretarial support and travel funds will be supplied by the International START Secretariat.

It is the responsibility of SARCS to screen applicants and, in consultation with the Director of the International START Secretariat, make a final decision regarding the secondment. It is expected that the person spend two years starting 1 July 1993 at the International START Secretariat.

Direct salary cost per year \$ 60,000; it is expected that the indirect costs can be supported through other sources available to the International START Secretariat.

Total cost for this activity: \$120,000

Activity 2: Further development of the global network of networks

The scientists from the three regions (Activity 1) will work with the permanent staff at the International START Secretariat to provide guidance and leadership for the promotion of Regional Research Networks in other regions. Such networks are described in Section 1.3 in the Project Document and include MEDIAS for the Mediterranean region; initiatives from the Chinese and Mongolian Academy of Sciences as well as the Siberian branch of the Russian Academy of Sciences for the Temperate East Asian region; a proposal from the Indian National IGBP Committee for South Asia as part of the Tropical Asian Monsoon Region; plans being developed by the SAF Regional Committee (SAFCOM); a proposal from ICSU's Scientific Committee on Antarctic Research (SCAR) for the Antarctic; and from the International Arctic Science Committee (IASC) for the Arctic. Discussions are also ongoing with the Commission of the European Communities and other organizations regarding strengthening of network activities in the Temperate Northern Hemisphere region.

In order to strengthen plans for inter-regional collaboration, the International START Secretariat will convene an annual meeting of Directors (or equivalent) of the START networks to discuss joint planning and cooperation. The first meeting will be held in 1994. In 1993, discussions between the leadership of the initial three priorities will have the opportunity to develop collaborative plans at the meetings of the START Standing Committee (see objective 2).

Travel funds for participants from six developing country networks (SARCS, TEA, Southern Asia, NAF, SAF, IAI); travel and per diem and related expenses for 6 persons per year for a total of \$18,000.

Total cost for this activity: \$54,000.

Activity 3: Development of communication networks within and between regions

The International START Secretariat will work with appropriate institutions, such as CIESIN, to develop plans for the linkage of all Regional Research Sites within a region through an electronic mail system and later a data sharing network. This planning effort will also consider the needs for links between regions and with the Core Projects of the HDP, IGBP and WCRP. This will be done in close consultation with IGBP-DIS.

Costs for this activity is listed under the two regions, and not in the budget for this component of the project.

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Immediate objective 2.

Arrange for the development of regional research projects as components of the three international programmes (HDP, IGBP, WCRP)

Output 1: Plans for how the regions will contribute to the Core Projects of HDP, IGBP and WCRP

Activity 1: Enable scientists from developing countries to be involved in discussions and decisions regarding priorities for IGBP research

Representatives of national IGBP committees and ICSU scientific bodies meet together with the IGBP Scientific Committee, representatives of HDP and WCRP as well as representatives of IGBP Core Projects at IGBP Scientific Advisory Council (SAC) meetings every second year. These meetings shape the general policy of the programme by providing guidance to the Scientific Committee for the IGBP. They also discuss the Core Projects as well as cross-disciplinary IGBP initiatives such as "Global Analysis, Interpretation and Modeling" (GAIM) and the "Data and Information System" (DIS), as well as START.

In alternate years, the Chairs of National Committees have meetings to discuss linkages between national and international efforts. It is expected that the next such meeting will be in 1994.

If scientists from developing countries are to be fully involved in all aspects of the international programme, their participation at these meetings is essential. The third meeting of the IGBP Scientific Advisory Council (SAC III) will be arranged in Ensenada, Mexico on 24-28 January 1993. The project should support the participation of the chairs of the National IGBP Committees in Indonesia, Malaysia, the Philippines, Singapore, and Thailand in this meeting.

Thus, for 1993, five participants for SAC III (travel and accommodation @ \$3,000 per person). Support for six persons to National Committee Meetings in each of 1994 and 1996 is included as well as six participants to SAC IV in 1995.

Total cost for this activity: \$69,000

Activity 2: Develop specific research projects in the regions that are fully compatible with the research projects of the three international programmes

The IGBP Core Projects arrange Core Projects Open Meetings, which are essential for presentation of recent results, discussions on how national projects can contribute to the international programme, and exchange of their experiences. It is

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necessary that key individuals involved in Core Project research in each of the two regions covered by this project be given the opportunity to attend such meetings. A current list of relevant meetings is enclosed (Annex 11).

Although detailed plans are not yet known, the First International Congress for the International Global Atmospheric Chemistry (IGAC) project will be held in Haifa, Israel, in April 1993. As IGAC is a key component of the SARCS activities, participation of two scientists from that region is planned. Participation of one scientist from IAI is also envisaged.

Participation of eleven scientists (@ \$1,000; local costs covered by the organizers) from the SAF region to the IGAC/GCTE/DIS/START workshop on "African Savannas and the Global Atmosphere" to be held in Zimbabwe in June 1993 is also planned. This meeting will develop detailed project plans for major initiatives on the role of savannas and land-use change in Africa, which will also make a major input to the 1995 IPCC assessment. Participation from NAF is covered in that section of the project.

The International START Secretariat will make detailed decisions regarding such participation when meeting plans are known. This will be done in consultation with SARCS, NAPCS and IC-IAI. Participation of 8 scientists for each of the years 1993, 1994 and 1995 (@\$3,000) is included.

Total cost for this activity: \$83,000.

Activity 3: Capacity building for impact assessments of global changes on terrestrial ecosystem

The GCTE Core Project of the IGBP has as one of its objectives to predict the effects of changes in climate, atmospheric composition and land-use on terrestrial ecosystems, including agriculture and production forest systems. In collaboration with START, GCTE will develop indigenous modeling expertise (see Activity 1.3.2 for Southeast Asia). To do so, it will assemble a package of prototype generic global change models for a variety of natural and managed ecosystems. Close collaboration will be required with the GCTE modeling programme, particularly through LEMA (Long-term Ecological Modeling Activity).

A person will be hired to work at the GCTE Core Project Office to compile existing models, help plan the first training course in Southeast Asia and work with the IAI and NAF, as well as other emerging networks in developing countries, to develop appropriate training packages. The staff person will also visit National IGBP Committees in less developed countries to identify present modeling capabilities and devise programmes for improving these capabilities. The project will supply \$7,000 per year (1994-1995) for travel in the region.

Total cost for this activity: \$14,000

Immediate objective 3:

To provide a forum for discussion of coordination between governmental and non-governmental organizations interested in global change regional network activities

Output 1: Plans for the development of a global system of global change research network of networks building on both START and complementary governmental initiatives

Activity 1: Meetings of the Standing Committee for START

The START Standing Committee meets twice a year (for 1993 in Washington, D.C., in April, and India in October). The costs for those meetings are covered by funds from participating nations. The meeting provides the general guidance for the development of START, discuss criteria for inclusion of Regional Research Network and Centres, provide a forum for discussion on cooperation between non-governmental initiatives (e.g., START) and governmental ones (e.g., IAI). The meetings also provide excellent opportunities to discuss how a global network of networks can be promoted built on existing regional networks. The IGBP has invited the IAI to nominate an ex officio member to the START-SC and is expected to do the same for SARCS and NAPCS. The budget includes costs for participation of these three representatives to two meetings per year of the START-SC (3 persons @ \$6,000 per year).

Total cost for this activity: \$72,000

Activity 2: Administrative support

The IGBP Secretariat sub-contractor will set aside sufficient time of a finance officer to be responsible for the handling of tickets, per diems, etc. as well as for financial reporting to OPS (\$17,500 per year). The overall guidance rests with the International START Secretariat at no cost to the project. The support is for four calendar years, including all of 1993, in view of the extraordinary work involved in the preparatory assistance and preparation of this document.

Total cost for this activity: \$70,000.

E. Inputs

UNDP inputs for this START project amount to a total of US\$ 4,093,720, of which \$80,000 (US\$18,000 for SARCS, US\$32,000 for NAPCS, US\$12,000 for IAI and US\$18,000 for START) has already been made available through a preparatory assistance grant to START. Funds for evaluation (US\$100,000) includes project RLA/92/G34 (IAI). OPS support costs amount to US\$ 231,720. The balance, US\$ 3,682,000, is broken down as follows: US\$ 2,732,000 for SARCS, US\$ 468,000 for NAPCS, US\$ 482,000 for START inter-regional coordination and planning for a global network of networks. The breakdown for the SARCS, NAF and START components, are as follows (details given in Annex 1):

	SARCS	NAPCS ⁺	START ⁺
Project Personnel	\$658,000		
Subcontracts	\$406,000	\$468,000	\$482,000
Training	\$1,196,000		
Equipment	\$472,000		
Total Allocation	\$2,732,000	\$468,000	\$482,000

Note:

+ The overall UNDP/GEF allocations for this category are to be sub-contracted to the IGBP and will be executed by the START Secretariat as per discussion in the text.

F. Risks

The proposed Regional Research Centre as well as the Regional Research Sites will be established based on the capacity of existing institutes. The project will strengthen the capacity of the RRC and RRS institutes for research monitoring and analysis, so minimal risk is foreseen.

G. Prior obligations and prerequisites

Governments participating in this project are expected to provide local facilities for START personnel on assignment as well as general policy support for the activities of this project.

H. Project review, reporting and evaluation

The project will be subject to review by representatives of the regional committees, the START Standing Committee and UNDP/OPS at least every 12 months, the first such meeting to be held within the first 12 months of the start of full implementation. The regional project managers, on behalf of SARCS and NAPCS, shall prepare a report of past achievements to the International START Secretariat, which will submit a synthesized report on the overall project every 12 months, 3 months before tripartite review. Additional Project Performance Evaluation Reports (PPERs) may be requested, if necessary, during the project.

A project terminal report will be prepared by each regional manager on behalf of SARCS and NAPCS and submitted to the International START Secretariat for inclusion in a synthesized terminal report for consideration at the terminal review meeting. This review will comprise both regions as well as the global START developments and the inputs will be coordinated by the International START Secretariat. It shall be prepared in draft sufficiently in advance to allow review and technical clearance by UNDP/GEF at the latest four months prior to the terminal review.

The project shall be subject to evaluation 18 months after the start of full implementation. The composition, terms of reference and precise timing will be decided after consultation between the parties to the project document.

I. Legal context

This project document shall be the instrument referred to as such in Article 1, para 1, of the Basic Assistance Agreement between the United Nations Development Programme and the Governments of those participating countries which have signed such agreement. Alternatively, for those participating countries which have not signed such agreement, the project document shall be the instrument referred to as a plan of operation in Article 1, para 2, of the agreement concerning assistance under the Special Fund Sector of the United Nations Development Programme, between the UNDP and the Governments of those participating countries which have signed such latter agreement.

The following types of revisions may be made to this project document with the signature of the UNDP principal project representative only, provided he or she is assured that the other signatories of the project document have no objections to the suggested change:

- (a) Revisions in, or additions of, any of the annexes of the project document.

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- (b) Revisions which do not involve significant changes in the immediate objectives, but are caused by the rearrangement of inputs already agreed to or by cost increases due to inflation; and
- (c) Mandatory annual revisions which refers the delivery of agreed project inputs or increased expert or other costs due to inflation or takes into account agency expenditure flexibility.

Annex 2. Time Table

Project Number: GLO/92/G31/C/1G/31
 Project Title: Global Change System for Analysis, Research and Training (START)
 Project Component: Southeast Asia (SARCS)

OUTPUTS/ACTIVITIES	RESPONSIBLE PARTY	SCHEDULE (IN MONTHS)															
		1993	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48
Objective 1: Improved estimates of greenhouse gas fluxes	SARCS																
Output 1: Regional assessment of current emissions	PAGASA																
Activity 1: Workshop to develop appropriate methodology	PAGASA			X													
Activity 2: Training courses for flux measurements	PAGASA				X					X							
Activity 3: Fellowship programme	SARCS				XXX												
Activity 4: Post-Doctoral programme	SARCS				XX	XXX											
Activity 5: Synthesis Workshop	PAGASA										X						
Output 2: Documentation of land-cover changes	Thai NRC																
Activity 1: Workshop to develop methodologies	Thai NRC					X											
Activity 2: Case studies of land-use changes	Thai NRC				XXX	XXX	XXX	XXX	XXX	XXX							
Activity 3: Fellowship programme	SARCS			XXX	XXX												
Activity 4: Equipment for GIS	SARCS				XXX	XXX	XXX										
Activity 5: Synthesis workshop and publication	Thai NRC												XXX	XXX	XXX	XXX	
Output 3: Effect of climate change on land-cover	SARCS																
Activity 1: Tutorial course on GCMs	CSIRO				X												
Activity 2: Training course on modelling ecosystem response to global change	CSIRO			XXX	XXX	X											
Output 4: Scenarios for future greenhouse gas emissions	SARCS																
Activity 1: Report preparation workshop for scientists	SARCS									XXX	XXX	XXX	XXX				
Activity 2: Workshop for policymakers	SARCS													X			
Objective 3: Develop regional data bases for use in global warming studies	SARCS																
Output 1: Assessment of regional access to relevant data bases	SARCS																
Activity 1: Inventory of existing data bases	CIESIN			XXX	XXX	XXX	XXX										
Objective 4: Establish regional network	SARCS																
Output 1: Establishment of START regional research network and Center	SARCS																
Activity 1: SARCS Secretariat	SARCS			XXX													
Activity 2: Establishment of an RRC	SARCS				XXX	XXX	XXX				XXX	XXX					
Output 2: Establishment of component of a communications network	START																
Activity 1: Establish electronic communication facilities	IGBP			XX													
Activity 2: Acquisition of communications nodes	IGBP			XX													
Output 3: A global change socio-economic research agenda	IGBP/HDP																
Activity 1: Planning meeting and workshop	IGBP/HDP			X													

Project Title: Global Change System for Analysis, Research and Training (START)
 Project Component: Northern Africa (NAPCS)

OUTPUTS/ACTIVITIES	RESPONSIBLE PARTY	SCHEDULE (IN MONTHS)																	
		1993			1994			1995			1996								
		3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	
Objective 1: Establish NAPCS and NAPCS/NAF Secretariat																			
Output 1: NAPCS establishment																			
Activity 1: NAPCS meetings	NAPCS			X		X		X		X		X		X		X		X	
Activity 2: NAPCS/NAF Secretariat	NAPCS			XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX								
Objective 2: NAF science -plan development																			
Output 1: Scientific priorities																			
Activity 1: Workshops	NAPCS					X		X		X		X		X		X		X	
Objective 3: Electronic data/information exchange network																			
Output 1: Implementation plan																			
Activity 1: Set-up of communication facilities	START				XXX	XXX	XXX	XXX	XXX	XXX	XXX								

Project Title: Global Change System for Analysis, Research and Training (START)
 Sub Component: A Global Network of Networks (START)

OUTPUTS/ACTIVITIES	RESPONSIBLE PARTY	SCHEDULE (IN MONTHS)																
		1993			1994			1995			1996							
		3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51
Objective 1: Coordination of regional networks <i>Sub-objective 1: Inter-regional coordination</i> Activity 1: Secondment to START Activity 2: Development of the global network of networks Activity 3: Development of a communications network	START			XXX	XXX	XXX	XXX	XXX										
	START			X	X	X	X	X										
	START			XXX	XXX	XXX	XXX	XXX										
	START			XXX	XXX	XXX	XXX	XXX										
	START			XXX	XXX	XXX	XXX	XXX										
Objective 2: Development of research projects <i>Sub-objective 1: Plans for contributions to HDP, IGBP, WCRP</i> Activity 1: Priority setting for IGBP research Activity 2: Development of research project plans Activity 3: Capacity building for impact studies	START																	
	START			X	X	X	X	X										
	START			XXX	XXX	XXX	XXX	XXX										
	START			XXX	XXX	XXX	XXX	XXX										
	GCTE CPO																	
Objective 3: Coordination between government and non-government <i>Sub-objective 1: Forum for discussions</i> Activity 1: Meetings of START-5C Activity 2: Administrative support	START																	
	START			X	X	X	X	X										
	START			XXX	XXX	XXX	XXX	XXX										
	IGBP			XXX	XXX	XXX	XXX	XXX										



Annex 3

Regional Cooperative Activities to Support Global Change Research in ASEAN Countries as a component of START (Global Change System for Analysis, Research and Training)

MANAGEMENT PLAN

100 PROJECT CONTEXT

101 Description of Project

The international research community has been involved in the debate on global change issues for several years. Three major international programmes addressing the scientific uncertainties related to global change phenomena are currently in existence. One of these programmes, the International Geosphere-Biosphere Programme (IGBP), addresses the biological and chemical controls of the Earth System, and the effects of changing climate on the biosphere. The IGBP, together with the World Climate Research Programme (WCRP) and the Human Dimensions of Global Environmental Change Programme (HDP), have developed plans for a Global Change System for Analysis, Research and Training (START). START will consist of a set of Regional Research Centres with affiliated networks of collaborating institutes.

The Southeast Asia region, initially comprising the ASEAN countries, is a major component of the Tropical Asian Monsoon Regions (*sensu* START), one of the three initial priority regions for the establishment of this network. To this effect a Southeast Asian Regional Committee for START (SARCS) has been established. SARCS will promote activities aimed at developing, synthesizing and interpreting regional data sets of key variables related to global change thereby enabling indigenous analysis and the incorporation of these data into global-scale modeling efforts.

Four primary objectives have been identified by SARCS:

- i. To improve estimates of greenhouse gas flux, especially in relation to changes in land use and land cover.
- ii. To integrate natural-social science assessments of the impact of sea-level rise on terrestrial and marine resources in the coastal zone.
- iii. To develop regional databases for use in global warming studies
- iv. To establish a regional network for global change research and lay the foundation for the creation of a regional research centre.

Activities will be undertaken in the form of pilot studies, data collection, workshops, training courses, postgraduate fellowships, and special studies to establish a regional network for global change research and the creation of a regional research centre.

Funding for the initial SARCS programme is estimated at US \$4 million over 4 years, of which 2.75 has been received from the Global Environment Facility (GEF) via UNDP within a package of support for three regions as well as international planning and coordination.

102 UNDP project strategy

The project will be executed by the Office of Project Support (OPS) of UNDP. The Southeast Asian Regional Committee for START (SARCS) will be responsible for the implementation of the project in the ASEAN region.

SARCS consists of representatives designated by National IGBP Committees (or equivalent) in the countries of ASEAN. There will also be representation of IGBP and HDP on SARCS to ensure close collaboration between the regional and international efforts.

SARCS meets twice a year to assess progress of ongoing activities, develop detailed plans for the following years activities and provide overall guidance for the implementation. SARCS is also responsible for developing outreach activities with other countries in the region as well as other regional activities within START.

A representative of SARCS will be invited to serve ex officio on the Standing Committee for START, thus ensuring appropriate coordination between the regional activities and those of other regions in START.

SARCS will appoint a person to serve at the International START Secretariat for a period of two years as a resource person to further develop START in general as well as collaborative activities between regions in which SARCS has a particular interest. He/she will also provide a focal point between the UNDP support in the region and that of other START activities supported by UNDP. The cost for such a secondment is partially included in the component of the UNDP project that deals with international coordination and the development of a global network of networks through the International START Secretariat.

SARCS receives advice on scientific matters from its Scientific Advisory Panel (SAP). The Panel, to be constituted at the end of 1992, will consist of no more than 18 members with no more than 6 members from outside the region.

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An interim SARCS secretariat has been established at the Industry & Technology Relations Office (INTRO) of the National University of Singapore in January 1993. The interim Secretariat will be contracted to serve until such time as a Regional Research Centre has been well established in the region and can take over the secretariat functions. INTRO will be responsible for the functions of the Secretariat under the guidance of SARCS and its Chairman. INTRO will designate Ms. Rosa Tan, its Assistant Director, upon the approval of SARCS, to be the contact person for all matters related to the work and responsibilities of the Secretariat and for its day to day operation.

Each ASEAN country will identify a National IGBP Committee or focal point responsible for national inputs to the project.

Each National IGBP Committee or national focal point will develop a strategy for the adoption and widespread use of the results from this project. These strategies will be presented and discussed at SARCS meetings with the purpose of preparing a consolidated strategy for information dissemination.

The Chairman of SARCS will have the responsibility and authority to identify potential problems and to suggest and propose alternative solutions to any problems which arise. Problem resolutions consistent with project objectives and within budget should be handled by the Project Manager. Problems which require a change in focus, a change in objective or project scope or an increase in budget for a particular activity will require full a decision by SARCS. The latter also needs the approval of OPS/UNDP.

SARCS has identified lead institutions for each of the outputs and activities within the four foci of the UNDP project document. Each output and activity will also have a person responsible for detailed planning, implementation and reporting. The identified institutions will bear ultimate responsibility and manage all activities in all participating countries on a continuing basis, according to the project work plans and guidelines developed by SARCS.

200 ORGANIZATION

201 SARCS

SARCS is responsible for the implementation of the project in the region. SARCS with the assistance of the Secretariat will be responsible for:

- i. development of annual work plans and budgets
- ii. review of project progress during the year including allocation of resources according to project plans, schedule and budget
- iii. formulation of recommendations to UNDP for ongoing implementation of the project and for any change from existing work plan

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- iv. provision of general directions to the Project Manager for the management and implementation of the project
- v. development of participation of the region in global change research also outside the UNDP project including developments of plans to secure funding for Focus of the UNDP project document and other priority activities it identifies
- vi. development of links with other countries bordering ASEAN that wish to collaborate with the SARCS on global change research of common interest
- vi. fostering strong collaboration with other Regional Research Networks as part of the START global network of networks through the International START Secretariat

203 SARCS SECRETARIAT

The SARCS Secretariat established at INTRO, led by a Project Manager:

- i. will be responsible for planning and coordination of SARCS activities with special emphasis on the UNDP project until such time that a Regional Research Centre is formally established
- ii. will be responsible for the implementation of immediate objective 3 and 4 of the UNDP project document
- iii. will authorize project expenditure from UNDP as defined in the work plan
- iv. will be the focal point for necessary consultations between UNDP/OPS and the region in relation to the project
- v. will, together with COSTED, compile a directory of researchers and institutes in the region involved in global change research.
- vi. will arrange SARCS and Scientific Advisory Panel meetings as well as other meetings and workshops as decided on by SARCS
- vii. will prepare annual progress reports, to be submitted to the International START Secretariat after SARCS approval, and prepare inputs to Project Performance Evaluation Reports as specified by UNDP/OPS
- viii. will maintain a depository of project information and documents

205 SARCS/GEF PROJECT MANAGER

The Project Manager, who is appointed by SARCS, shall be the executive officer of the SARCS Secretariat. He/she will:

- i. prepare, in consultation with SARCS, detailed work plans for the activities of the project including detailed budgets for all activities and reports on activities under the project.
- ii. oversee the implementation of the annual plans as agreed upon between SARCS and UNDP/OPS

- iii. be responsible for the authorization of payments from UNEP/OPS, maintain detailed records of all payments and ensure that cost overruns do not occur unless authorized by UNEP/OPS at the recommendation of SARCS.
- iv. be responsible for the day to day operations of the SARCS Secretariat and the implementation of activities as decided by SARCS
- v. maintain close contacts with institutes and individuals charged with responsibilities for individual activities as decided only by SARCS.
- vi. act as Secretary to SARCS and its Scientific Advisory Panel and participate ex-officio in meetings of these bodies
- vii. upon request of the SARCS Chair, represent SARCS in discussions on the role of the Southeast Asian Regional Research Network in the overall system of START and ensure proper liaison and collaboration with other RRNs in START.
- viii. ensure proper communication with the scientific community within the SARCS region as well as with other countries interested in activities of SARCS
- ix. maintain proper communications with the International START Secretariat
- x. be responsible for reporting to UNDP/OPS as specified in the project document
- xi. perform any other functions entrusted to him/her by SARCS or its Chair.

206 INSTITUTIONS RESPONSIBLE FOR PROJECT ACTIVITIES

SARCS will appoint one institution within the region responsible for each of the project activities. Within each institution, an individual will be named as the contact point. The institutions, through the designated individual, will be responsible for:

- i. managing and coordinating the project activity for which it is responsible consistent with project terms of reference and guidelines developed by SARCS
- ii. managing and administering project funds, allocated to the activity, in accordance with established UNDP/OPS procedures and administrative rules within the host country
- iii. developing the appropriate official and working level arrangements with all participating organizations within the participating countries
- iv. reporting to SARCS, through the Project Manager on project activities and operating performance

300 Financial Arrangements

Part of the funding for the initial SARCS programme, estimated at US \$4 million over 4 years, will be provided by the Global Environment Facility (GEF) via UNDP. The UNDP budget is included in Annex 1.

Generally, project funds will be administered and disbursed by UNDP/OPS to the implementing institution at the request of the SARCS Secretariat. Details on financial disbursement procedures and reporting requirements will be worked out with OPS/UNDP.

400 REPORTING

This Management Plan, after review by OPS and approval by SARCS, will serve as the framework for operation during the project period. The reporting necessary is specified in the UNDP project document. At the beginning of each project year, SARCS will prepare a detailed work plan and budget. This plan will form the basis for project management and reporting. Progress reports on a quarterly basis will be prepared by the implementing institutions with active work programmes. Reporting to the International START Secretariat and UNDP is specified in the UNDP project document.

The Project Manager will collate quarterly financial reports to SARCS on disbursements and variances, if any, from the annual operation plan. Annual statements will be required from the implementing institutions on the use of project resources.

Financial statements will be audited, if required, by an appropriate independent agency, at project expense.

Annex 4

SARCS Project Manager (not relevant for period of interim Secretariat)

Terms of Reference

Position: Project Manager, Southeast Asian component, UNDP Project GLO/92/G31/A/1G/31

Duration: Four years

Starting date: 1 January 1993 or soonest thereafter

Location: At the Regional Research Centre. The manager shall not necessarily be a citizen or permanent resident of the nation hosting the Secretariat.

Terms of Reference

1. The project manager shall be the executive officer of the Southeast Asian component of the UNDP/GEF project "Global Change System for Analysis, Research and Training (START)"
2. The project manager is responsible to the Chairman of the Southeast Asian Regional Committee for START (SARCS)
3. The project manager shall:
 - a. Prepare and submit to SARCS proposed short-, medium- and long-term plans for the activities of the project; detailed budgets for all activities and reports on activities carried out under the project.
 - b. Oversee the implementation of the annual plans as agreed upon between SARCS and UNDP/OPS
 - c. Be responsible for the authorization of payments from UNDP/OPS, maintain detailed records of all payments and ensure that cost overruns do not occur unless authorized by UNEP/OPS at the recommendation of SARCS.
 - d. Be responsible for the day-to-day operations of the SARCS Secretariat and the implementation of activities as decided on by SARCS.

May 7, 1993

- e. Maintain close contacts with institutes and individuals charged with responsibilities for individual activities as decided by SARCS.
- f. Act as Secretary to the SARCS Scientific Advisory Panel and participate ex officio in the meetings of SARCS.
- g. Upon the request of the SARCS Chair, represent SARCS in discussions on the role of the Southeast Asian Regional Research Network in the overall system of START and ensure proper liaison and collaboration with other RRNs in START.
- h. Ensure proper communication with the scientific community within the SARCS region as well as with other countries interested in the activities of SARCS.
- i. Maintain proper communication with the International START Secretariat.
- j. Be responsible for reporting to UNDP/OPS as specified in the project document.
- k. Perform any other functions entrusted to him/her by SARCS or its Chair.

May 7, 1993

Annex 5

Southeast Asian Regional Committee for START (SARCS)

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Annex 6

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Annex 8

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Annex 9

Memorandum of Understanding Between the
START Standing Committee
of the International Geosphere-Biosphere Programme (IGBP) of the
International Council of Scientific Unions
and
The Consortium for International Earth Science Information Network
(CIESIN)
Regarding Support for the Operation of
the International START Secretariat
(Global Change System for Analysis, Research and Training)
in Washington, DC., USA

1. Background

The International Geosphere-Biosphere Programme (IGBP) of the International Council of Scientific Unions (ICSU), in collaboration with the World Climate Research Program (WCRP) of the World Meteorological Organization and ICSU and the Human Dimensions of Global Environmental Change Program (HDP) of the International Social Sciences Council (ISSC), has undertaken the task of implementing a world-wide network of networks that will support regional and national efforts around the world to decrease the scientific uncertainties related to global change phenomena. The initiative is identified by the acronym START: Global Change System for Analysis, Research, and Training. The immediate goal is to help establish Regional Research Networks and Regional Research Centers, with the immediate priority for Equatorial South America, Northern Africa and the Tropical Asian Monsoon Region. They will provide regional foci as well as international points of connection for the START initiative.

Activities of each of the START Regional Research Networks and Centers will include site research and monitoring involving regional effects of global environmental change; th

...with those of the START Program, particularly in areas involving the international dissemination of data regarding global change both to scientists and to an international user community that includes policy makers at all levels of governments. In addition, CIESIN is now negotiating with the ISSC HDP to become the Data and Information System for that program, one of the collaborating programs involved in START. CIESIN is also committed to serve information needs of the less developed countries in areas of environmental concern, which defines another significant overlap with START.

These overlapping requirements led CIESIN to offer to assist the START initiative in establishing and supporting an International START Secretariat, now located in Washington, DC. This Memorandum delineates the mutually agreed upon terms and conditions of CIESIN's support for the Secretariat. Expanded collaboration in the area of the international dissemination of data and information is also foreseen.

2. Level and Duration of Support Provided by CIESIN

a. **CIESIN will fund specific costs associated with the International START Secretariat at the level of \$450,000 for the period from July 1992 through February 1993 and at the level of about \$850,000 for the ensuing year, i.e., through February 1994, subject to CIESIN's receipt of sufficient funding. CIESIN expects to support the International START Secretariat at about the CY1993 level through the end of the calendar year 1995--i.e., for a total period of 42 months, provided that CIESIN in fact receives the level of funding it expects. CIESIN funds will be used to employ the Director of the International START Secretariat and other employees working at the International START Secretariat, direct costs incurred by START in connection with its office operations (such as telephone equipment and services, facsimile, photocopy, postage, printing costs as agreed, office rent), and staff travel as agreed. Changes in budget allocations within the overall agreed upon budget may be made upon agreement among the START Director, the CIESIN Chief Scientist and the CIESIN Vice-President, Finance and Administration.**

Funds provided by CIESIN shall be subject to the terms and conditions under which CIESIN receives the funds, and the International START Secretariat shall comply with such provisions, such as the NASA Provisional Disposal Terms and Cooperative Agreement

b. All other costs of the International START Secretariat shall be the sole responsibility of the START Standing Committee. The START Standing Committee may assign non-CIESIN staff to the International START Secretariat, agrees that these individuals are not the employees of CIESIN, and agrees to be responsible for any federal, state, or local income taxes and payroll taxes, and for the salaries and benefits for such individuals. The START Standing Committee shall be responsible for any non-CIESIN staff assigned to the Secretariat.

c. CIESIN will provide financial and administrative support services for the International START Secretariat, including payroll functions, purchasing services, financial management, contracting, etc. Any funds provided by sponsors outside of CIESIN or the US Government for support of the International START Secretariat, and administered by CIESIN, shall be governed by the sponsors' requirements. CIESIN fringe benefits, overhead, G&A, and/or other charges, consistent with standard practice, will be applied to the expenditure of any such funds administered in this way by CIESIN. Standard CIESIN indirect cost rates (as approved by the US Government) will be applied to all funds managed by CIESIN in support of the International START Secretariat, regardless of the source of these funds. CIESIN employees working with the International START Secretariat shall be governed by the terms of their employment with CIESIN.

d. The CIESIN President (and/or other CIESIN officers he/she may designate) and the Chairman of the START Standing Committee (or other representatives of the START Standing Committee he/she may designate) will meet at least once each year to mutually evaluate the joint arrangements described here, to discuss further opportunities that may arise for association, and to address other business related to this agreement.

e. This Agreement may be terminated at any time by the mutual written agreement of the two parties, and by either party upon 180 days written notice to the other.

3. Employment and Status of International START Secretariat Personnel

The Director of the International START Secretariat shall direct the activities of the START Secretariat pursuant to the instructions of the START Standing Committee. The Director shall be accountable to the START Standing Committee for his or her performance and the performance of the START Secretariat, and for administrative purposes shall follow CIESIN's Standard Practices Guides.

4. Shared Equipment and Services

a. The International START Secretariat will commence operations during the month of July 1992 in shared quarters with CIESIN. On or about 1 October 1992 separate space, leased by CIESIN for the International START Secretariat under the terms of this Agreement, will become available.

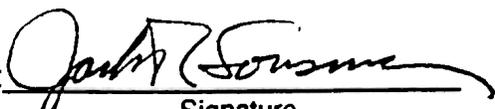
b. The Directors of the CIESIN Washington, DC Office and of the International START Secretariat will periodically assess mutually acceptable possibilities for the sharing of office equipment and services as a way of operating most economically, while holding to mutual needs of administrative and fiscal independence.

5. Other Areas of Scientific Collaboration

CIESIN and START will explore possibilities for other avenues of mutually beneficial collaboration in the project. These may include the potential benefit to the START initiative of CIESIN's plans to contribute to the development of a world-wide network for the dissemination of scientific information regarding global environmental change and the possible designation of CIESIN as the operative Data and Information System for the Human Dimensions Program of the ISSC.

WHEREFORE, THE PARTIES HAVE READ THIS AGREEMENT, UNDERSTAND ITS TERMS, AND AGREE TO BE BOUND BY THEM. THEY HAVE CAUSED THIS AGREEMENT TO BE EXECUTED BY THEIR DULY-AUTHORIZED OFFICERS.

FOR: CONSORTIUM FOR
INTERNATIONAL EARTH SCIENCE
INFORMATION NETWORK (CIESIN)

BY: 
Signature

NAME: Jack R. Lousma

TITLE: President

DATE: 6 Nov 92

TECHNICAL CONTACT:

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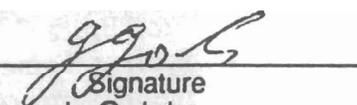
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Committee)

BY: 
Signature

NAME: Genady Golubev

TITLE: Chairman

DATE: 16 November 1992

TECHNICAL CONTACT:

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Annex 10

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Dr. Annabelle Amoin Konan, Centre de Recherches Océanologiques, Laboratoire d'Ecologie Benthique, 29, rue des pêcheurs BP V 18 Abidjan. Tel: (+225) 35 50 14; Fax: (+225) 24 65 04.

Cuba (1989)

Prof. Carlos Gómez Gutiérrez, Academia de Ciencias de la Republica de Cuba, Capitolio Nacional, Industria y San José, La Habana. Tel: (+53-7) 68914; Telex: 511290 acdcp cu.

Czech Republic (1987)

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Secretary Dr. Jan Lastovicka, Geophysical Institute Bocni II, 141-31 Prague 4, Czech Republic. Tel: (+42-2) 762 548, Fax: (+42-2) 762 528, E-mail: jlast@cspgig11 (earn/bitnet)

Denmark (1990)

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Egypt (1988)

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Finland (1989)

Chair Dr. Per-Edvin Persson, Director, Heureka, The Finnish Science Centre, PO Box 166, SF-01301 Vantaa. Tel: (+358-0) 85 799, Fax: (+358-0) 873 4142.

Secretary Marku Kanninen, The Finnish Research Programme on Climate Change, Academy of Finland, P O Box 57, SF-00551, Helsinki, Finland, Tel: (+358-0) 775 8336, Fax: (+358-0) 775 8299, E-mail: silmu@aka.fi

France (1988)

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Secretary Dr. Sabine Lütkemier, IGBP-Sekretariat, Institut für Meteorologie, Freie Universität Berlin, Dietrich Schäfer-Weg 6-10, D-1000 Berlin 41, Germany. Tel: (+49-30) 838 71117, Fax: (+49-30) 838 71160, E mail: H.Bolle.IGBP (Omnet)

Greece (1988)

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Hungary (1987)

Chair Prof. Joseph Tlgyi, Biophysical Institute of the Medical University, PO Box 99, H-7643 Pécs. Tel: (+36-72) 140 17; Telex: 12500 pote h; Fax: (+36-72) 262 44.

Secretary Mrs. Susan Borhidi-Thúry, Center for Regional Research, Janus Pannonius University, Kulich Gy. u. 22, H-7601 Pécs, Hungary.

India (1988)

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Indonesia (1992)

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Ireland (October 1988)

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Israel (1988)

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Italy (1990)

Dr. Angelo Guerrini, President, National Committee for Science and Technology of the Environment, National Council for Research, Piazzale Aldo Moro, 7, I-00185 Roma. Tel: (+39-6) 49 93 33 49; Telex: 610076 enr rm i; Fax: (+39-6) 446 98 33.

Jamaica (1988)

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Japan (1987)

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Vice-Chair Prof. Yasuyuki Ooshima, Waseda University, Tokorozawa-City, 350 Japan.

Kenya (1990)

Chair Prof. Shem O. Wandiga, Deputy Vice Chancellor, University of Nairobi, PO Box 30197, Nairobi. Tel: (+254-2) 33 42 44; Telex: 22095 varsity ke; Fax: (+254-2) 33 68 85.

Secretary Prof. Isaac V. Nyambok, Department of Meteorology, University of Nairobi, PO Box 30197, Nairobi, Kenya

Malaysia (1992)

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Mexico (1991)

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Netherlands (1987)

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Secretary Dr. Hans van Emden, KNAW, Royal Netherlands Academy of Sciences, PO Box 19121, NL-1000 GC Amsterdam, Netherlands. Tel: (+31-20) 551 07 32, Fax: (+31-20) 620 49 41

New Zealand (1988)

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Niger (1991)

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Nigeria (1992)

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Norway (1989)

Chair Prof. Ivar S. A. Isaksen, Institute of Geophysics, University of Oslo, PO Box 1022 Blindern, N-0315 Oslo 3. Tel: (+47-2) 85 58 22; Fax: (+47-2) 85 52 69.

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Peru (1989)

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Philippines (1992)

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Poland (1989)

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Romania (1991)

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Russia (formerly USSR Committee, 1988)

Chair Prof. Vladimir M. Kotlyakov, Institute of Geography, Russian Academy of Sciences, Staromonetny per. 29, Moscow 109017, Russia. Tel: (+7-095) 238 8610, Tlx: (64) 411781 globe, Telefax: (+7-095) 230 2090, E-mail: V.Kotlyakov (Omnet)

Secretary Dr. Yuri A. Starikov, Deputy Director, International Scientific Environmental Center, Russian Academy of Sciences, Ulianovskaya 51, 109 004 Moscow, Russian. Tel: (+7-095) 237 8062, 954 5243, Telex: 411964 ans su, Fax: (+7-095) 137 3622.

Slovakia (1993)

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South Africa (1987)

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Secretary Dr. D Walmsley (at above address)

Spain (1993)

Chair Dr. José Manuel Moreno, Secretaria General del Plan Nacional de I+D, Comisión Interministerial de Ciencia y Tecnología, Rosario Pino, 14-16, E-18020 Madrid. Tel: (+34-1) 572 0098, Telex: 49692 cicyt e, Fax: (+34-1) 571 8998.

Secretary Dr. Julio Montes (at above address)

Sri Lanka (1990)

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Sweden (1987)

Chair Prof. Nils Malmer, Department of Plant Ecology, Östravallgatan 14, University of Lund, 223 61 Lund. Tel: (+46-46) 10 92 99, 10 92 95; Telex: 33533 luniver s; Fax: (+46-46) 10 44 23.

Secretary Ms. Irène Johansson, Swedish Natural Science Research Council, Box 6711, S-113 85 Stockholm, Sweden.

Switzerland (1987)

Chair Prof. Hans R. Thierstein, Geologisches Institut, ETH-Zentrum, CH-8092 Zürich. Tel: (+41-1) 256 36 66; Telex: 817379 ehg ch, Fax: (+41-1) 252 70 08.

Secretariat Ms. Anne-Christine Clottu Vogel, Swiss Academy of Sciences, Bärenplatz 2, CH-3011 Berne, Switzerland. Tel: (+41-31) 21 21 14, Fax: (+41-31) 21 32 91.

Thailand (1989)

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Togo (1992)

Chair Prof. Komlavi Seddoh, Vice-Chancellor of the University of Benin, B P 1515 Lomé. Tel: (+228) 21 35 00; Telex: 5258 ub tg.

Secretary Dr. Ayéchoro Koffi Akibode, Ecole Supérieure d'Agronomie, University of Benin, B.P. 999, Lomé, Togo

Tunisia (1993)

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Uganda (1990)

Chair Dr. S.P. Kagoda, Commissioner for Technology, Ministry of Industry and Technology, PO Box 7125, Kampala.

Secretary Dr. W. A. Majugu, Eastern & Southern African Drought Monitoring Centre, PO Box 3025, Nairobi, Kenya

United Kingdom (1987)

Chair Dr. Bernard Tinker, GCTE Associate Project Office, Department of Plant Sciences, University of Oxford, South Parks Road, Oxford OX1 3RB. Tel: (+44 865) 275 079; Fax: (+44 865) 275 074)

Secretary Mr. Len Mole, The Royal Society, 6 Carlton House Terrace, London, SW1Y 5AG, UK. Tel: (+44-71) 839 5561, Telex 917876, Fax: (+44-71) 930 2179

United States (1987)

Chair Dr. Ralph J. Cicerone, Geosciences Department, 220 Physical Sciences Building, University of California, Irvine, CA 92717. Tel: (+1-714) 725 2157; Fax: (+1-714) 725 2261; E-mail: R.Cicerone (Omnet).

Secretary Dr. John S. Perry, Staff Director, Atmospheric Sciences & Climate, National Research Council, 2101 Constitution Avenue, NW, Washington, DC 20418, USA

Venezuela (1988)

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Zambia (1990)

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Zimbabwe (1989)

Dr. G. R. Chimonyo, Department of Geography, University of Zimbabwe, PO Box MP 167, Mount Pleasant, Harare. Tel: (+263-4) 30 32 11, ext. 1265; Telex: 26580 univz zw; Fax: (+263-4) 30 32 92.

Annex 11

List of Relevant IGBP, WCRP and HDP Meetings

1993

- | | |
|-------------|---|
| 28-31 March | Taxco, Mexico
HDP-IGBP/START Inter-American Regional Workshop on
Global Environmental Change in Latin America: Collaborative
Research in the Social and Natural Sciences |
| March | Uganda
Limnology, Climatology and Palaeoclimatology of the East
African Lakes |
| 5-7 April | Hobart, Tasmania, Australia
International Antarctic Drifting Buoy Planning Meeting, first
session |
| 7-10 April | Graz, Austria
Human Dimensions of Global Environmental Change-Data
and Information Systems meeting |
| 12-15 April | Pack Forest, Washington, USA
GCTE Focus 3 Workshop: Global Change and Forested
Ecosystems |
| 16-19 April | Moscow, Russia
Meeting of Industrial Transformation; Industrial Growth
Working Group |
| 17 April | Eilat, Israel
IGAC Council: Scientific Steering Committee and Activity
Conveners |
| 18-22 April | Eilat, Israel
First IGAC Scientific Conference |
| 19-21 April | Geneva, Switzerland
WMO Intergovernmental TOGA Board - Sixth Session |
| 21-22 April | Taipei, Taiwan
PAGES Workshop on High Resolution Records of Past
Climate from Monsoon Asia: the last 2000 years & beyond |

May 7, 1993

22-23 April Washington, D.C., USA
6th START Standing Committee Meeting

26-30 April Hamburg, Germany
WMO TOGA Numerical Experimentation Group - Sixth Session

27-29 April Warnemünde, Germany
JGOFS North Atlantic Planning Group Workshop

29-30 April Cambridge, MA, USA
GAIM Task Force meeting

May Texel, Netherlands
Focus 4 of IGBP Core Project Land Ocean Interactions in the Coastal Zone (LOICZ)

May First meeting of MEDCOM

10-12 May Barcelona, Spain
HDP and ISSC officers and representatives of National Programmes on Global Change

10-12 May Beijing, China
IGBP Officers Meeting

10-12 May Accra, Ghana
First North African Planning Committee for START Meeting

10-14 May Bologna, Italy
WMO Workshop on Atmospheric Model Intercomparison Project

13-14 May Barcelona, Spain
Meeting of the Land Use/Land Cover Working Group

17-20 May Raleigh, NC, USA
Open Meeting on the IGBP Core Project Land Ocean Interactions in the Coastal Zone (LOICZ)

17-21 May Manila, Philippines
Third Meeting of the Southeast Asian Regional Committee for START (SARCS)
First Scientific Advisory Panel Meeting (SAP)

24-25 May Washington, D.C., USA
IGBP Core Projects Managers Meeting

May 7, 1993

June	Brazil BAHC Focus-2, with GCTE and Unesco, planning meeting for the Amazon Experiment (LAMBADA)
1 June	Victoria Falls, Zimbabwe Second Meeting of the START Regional Committee for Southern, Central and Eastern Africa
2-5 June	Victoria Falls, Zimbabwe African Savannas, Land Use, and Global Change: Interactions of Climate, Productivity and Emissions - a joint IGBP START/IGAC/GCTE/DIS/GAIM Meeting
7-8 June	New York, NY, USA Land Use/Cover Change Project Modeling Working Group
7-8 June	Amsterdam, Netherlands START in Europe: A Regional Initiative for the Development of a European Network for Global Change Research
14-16 June	Plymouth, UK. JGOFS - Intergovernmental Oceanographic Commission CO ₂ Advisory Panel
17-19 June	Southampton, UK. Global Ocean Euphotic Zone Study Meeting
28 June-1 July	Ispra, Italy 7th IGBP Scientific Committee Meeting
29 June-2 July	Pasadena, Florida, USA WMO Spaceborne Cloud Radar Workshop
1-3 July	Helsinki, Finland Meeting of the PAGEC Working Group (Perception and Assessment of Global Environmental Conditions and Change)
5-9 July	Tokyo, Japan WMO GPCP Working Group on Data Management, 7th Session
11-23 July	Yokohama, Japan IAMAP Symposium on Climate Modeling WCRP SPARC Project Symposium
15-16 July	Yokohama, Japan GEWEX Cloud System Study Implementation Plan Review

May 7, 1993

- 5 August Mexico City, Mexico
Meeting of the HDP Officers
- 16-20 August Geneva, Switzerland
WMO TOGA Scientific Steering Group, 12th Session
- 21-26 August Oppdal, Norway
Anticipated Effects of Global Change on the Structure and Function of Terrestrial and Arctic Ecosystems: an International Conference
- 2-6 September Yokohama, Japan
GCTE Symposium: Global Change Impacts on Terrestrial Ecosystems in Monsoon Asia, followed by GCTE Scientific Committee meeting.
- 13-15 September Cambridge, UK.
First Session of the Scientific Steering Group for the WCRP SPARC Project
- 13-17 September Sidney, BC., Canada
WCRP Steering Group on Global Climate Modeling
- 29 Sept. - 1 Oct. Taipei, Taiwan
4th International Group of Funding Agencies for Global Change Research (IGFA) Meeting
- 4-8 October Mainz, Germany
Steering Group on the Arctic Climate System Study, 2nd Session
- 13-15 October Geneva, Switzerland
Meeting of the HDP Executive Committee and Chairs of the HDP Working Groups
- 18-20 October Washington, D.C., USA
International Workshop on Cloud-Radiation Interactions and their Parameterization in Climate Models
- 25-27 October India
7th START Standing Committee meeting
- 25-28 October Normal, Oklahoma, USA
GEWEX Continental-scale International Project (GCIP) Panel Meeting

May 7, 1993

October

Asilomar, CA, USA
Developing GCTE Transects and Study Areas for Biochemical
Research and Ecosystem Dynamics Modeling

30 Nov-3 Dec

Taipei, Taiwan
APARE/IGAC Intl. Conference on Regional Environment and
Climate Changes in East Asia

1994

17-21 January

Lilongwe, Malawi
First Regional SAF Workshop

14-16 March

Bonn, Germany
Fourth Meeting of the IGBP National Committees

April

Woods Hole, MA, USA
First GCTE International Conference

Spring

First START Workshop for the Arab Region

5-9 September

Fuji-Yoshida, Japan
2nd Scientific Congress of the Intl. Global Atmospheric
Chemistry Project (IGAC) and 8th Symposium of the IAMAP
Commission on Atmospheric Chemistry and Global Pollution

Annex 12

Copy of Memo from Mr. Scholl of UNDP's RBAP/RPD

To: Mr. Philip Reynolds
Senior Programme Officer
DGIP

From: Willi Scholl *W. Scholl*
Regional Programme Officer
RPD/RBAP

Date: 15 April 1993

File: GLO/92/G31

Extension: 5872

Subject: GLO/92/G31 - Global Change System for Analysis, Research and Training

Further to our telephone conversation of today, please find below my comments on the START programme and its relationship to the Regional Greenhouse Gas Programme (RAS/92/G31).

1. As far as I can see there is no apparent overlap or duplication in the proposed schedule of activities of the two programmes. Both programmes, while dealing with the same subject matter, approach it from a different angle. The regional programme basically aims at enabling the countries of the region to prepare greenhouse gas inventories and develop policy responses for mitigation and adaptation, whereas the START programme concentrates on improving the knowledge on climate change and its potential local and regional impact.

2. Obviously these two aspects of the climate change issue are closely related making collaboration between these two programmes an absolute necessity particularly as we will be dealing, in many instances, with the same counterparts at the country level.

3. In terms of geographical coverage, there are three countries in the regional programme which are also covered by the START programme, namely Indonesia, Philippines and Thailand.

4. Regarding the thematic coverage, we note that the START proposal particularly focuses on the assessment of biological sources and sinks, while the regional programme concentrates on man-made sources and sinks. It should be noted, however, that in a number of cases including in Indonesia, Philippines and Thailand, the regional programmes also cover biological sources and sinks. In this connection, we draw your attention to Table 3A of the Programme Document (copy attached) and the summary of activities per country. Every effort should be made to harmonize both programmes for mutual benefit.

Memo to Mr. Phil Reynolds
13 April 1993
Page 2

5. With regard to the Coordination Arrangements, we would like to propose that the regional programme be represented on the SARC through its Programme Coordinator. We would, in turn, welcome a representation from SARC on the Scientific Advisory Committee, the policy making organ of the regional programme, and the national Steering Committees which will provide overall advice to the Implementing Agency (Asian Development Bank) on the execution of the programme. We note that in most cases the same persons have been proposed in both documents as members of the latter body. It is also suggested to establish a working relationship between your interim Secretariat and the programme management of the regional effort.

6. As mentioned in the document, it should be ensured that training activities of both programmes are closely coordinated. This refers particularly to Activity 1 (methodology) and Activity 2 (flux measurements) on page 12, both of which have been de-emphasized in the regional programme due to financial and other constraints.

7. The outputs of the activities relating to Immediate Objective 3 and 4 are conceivably very important for the regional programme. Data relating to the climate change issue is very dispersed in the region and even globally. The establishment of a regional data base in this respect is, therefore, very desirable and could provide a valuable input for the regional programme. Similarly, the proposed establishment of a directory of researchers and institutes in the region involved in global change research would be quite useful as the regional programme will attempt to draw as much as possible on regional expertise for consultancies and expert services.

We would appreciate if the above comments could be incorporated in the Programme Document as appropriate. We will also make the necessary cross-references in the regional programme. As discussed, we would be prepared to meet with the START Secretariat, if this becomes necessary, at a later stage. If you need any further clarification, please do not hesitate to get in touch with us.

cc: KGS
EM
NN

Annex 13

List of Acronyms

ABN	African Biosciences Network
ACSYS	Arctic Climate System (WCRP)
ADB	Asian Development Bank
ACMAD	African Centre of Meteorological Applications for Development (WMO)
ANT	Antarctica (START)
ART	Arctic (START)
ASEAN	Association of Southeast Asian Countries
ASMC	ASEAN Specialized Meteorological Centre
ASOEN	ASEAN Senior Officials on the Environment
BAHC	Biospheric Aspects of the Hydrological Cycle Core Project (IGBP)
CAA	Central Arid Asia (START)
CAR	Caribbean (START)
CEC	Commission of the European Communities
CGIAR	Consultative Group on International Agricultural Research
CIESIN	Consortium for International Earth Science Information Network
CLIVAR	Climate Variability and Predictability (WCRP)
COST	Committee on Science and Technology (ASEAN)
COSTED	Committee on Science and Technology in Developing Countries (ICSU)
CSC	Commonwealth Science Council
CSIRO	Commonwealth Scientific and Industrial Research Organization (Australia)
DIS	Data and Information System (IGBP)
ENRICH	European Network for Research in Global Change (CEC)
ENSO	El Niño phenomenon
ESA	Equatorial South America (START)
FCCC	Framework Convention on Climate Change (UN)
GAIM	Global Analysis, Interpretation and Modeling (IGBP)
GCM	General Circulation Model (Global Climate Model)
GCTE	Global Change and Terrestrial Ecosystems Core Project (IGBP)
GCOS	Global Climate Observing System (WMO/IOC/ICSU/UNEP)
GEF	Global Environment Facility (World Bank/UNDP/UNEP)
GEMS	Global Environment Monitoring System (UNEP)
GEWEX	Global Energy and Water Cycle Experiment (WCRP)
GIS	Geographic Information System
GOES	Global Omnibus Environmental Study
GOOS	Global Ocean Observing System
GRID	Global Resource Information Database (UNEP)
GTOS	Global Terrestrial Observing System

HDP	Human Dimensions of Global Environmental Change Programme (ISSC)
IAEA	International Atomic Energy Agency (UN)
IAI	Inter-American Institute for Global Change Research
IASC	International Arctic Science Committee (ICSU)
IC	Implementation Committee of the IAI
ICC	Intergovernmental Coordinating Committee (IGBP)
ICSU	International Council of Scientific Unions
IFS	International Foundation for Science
IGAC	International Global Atmospheric Chemistry project (IGBP)
IGBP	International Geosphere-Biosphere Programme: A Study of Global Change (ICSU)
IGFA	International Group of Funding Agencies for Global Change Research
IIASA	International Institute for Applied Systems
INC	Intergovernmental Negotiating Committee for the FCCC (UN)
INTRO	Industry & Technology Relations Office of the National University of Singapore
IOC	International Oceanographic Commission (Unesco)
IPCC	Intergovernmental Panel on Climate Change (UNEP, WMO)
IRRI	International Rice Research Institute
ISSC	International Social Science Council
JGOFS	Joint Global Ocean Flux Study Core Project (IGBP)
JSC	Joint Scientific Committee for the WCRP (ICSU/IOC/WMO)
LAPAN	National Institute for Aeronautics and Space (Indonesia)
LEMA	Long-term Ecological Modeling Activity (GCTE)
LIPI	Indonesian Institute of Sciences
LOICZ	Land-Ocean Interactions in the Coastal Zone Core Project (IGBP)
MAB	Man and the Biosphere Programme (Unesco)
MED	Mediterranean region (START)
MEDCOM	START Regional Committee for the Mediterranean Region
MEDIAS	Réseau de Recherche Régional pour le Bassin Méditerranéen et l'Afrique Subtropicale
NAF	Northern Africa (START)
NAPCS	Northern Africa Planning Committee for START (NAF)
OCE	Oceania (START)
OECD	Organization for Economic Cooperation and Development
OPS	Office of Project Services (UNDP)
PAGASA	Philippine Atmospheric, Geophysical and Astrophysical Services Administration
PAGES	Past Global Changes Core Project (IGBP)
PPER	Project Performance Evaluation Report (UNDP)
RRC	Regional Research Centre (START)
RRN	Regional Research Network (START)
RRS	Regional Research Site (START)
SAC	Scientific Advisory Council (IGBP)
SAC III	Third Meeting of the SAC - Ensenada, Mexico, January 1993

SAC IV	Fourth Meeting of the SAC - 4
SAF	Southern, Central and Eastern Africa (START)
SAFCOM	START Regional Committee for Southern, Central and Eastern Africa (SAF)
SAP	Scientific Advisory Panel (SAK)
SARCS	Southeast Asian Regional Committee for START
SC-IGBP	Scientific Committee for the IGBP
SCAR	Scientific Committee on Antarctic Research (ICSU)
SCOPE	Scientific Committee on Problems of the Environment (ICSU)
OSS	Observatoire du Sahara et du Sahel (France)
START	Global Change System for Analysis, Research and Training (IGBP in collaboration with WCRP and HDP)
START-SC	START Standing Committee
TAM	Tropical Asian Monsoon region (START)
TEA	Temperate East Asia (START)
TNH	Temperate Northern Hemisphere (START)
TOGA	Tropical Ocean and Global Atmosphere (WCRP)
TSA	Temperate South America (START)
UN	United Nations
UNCED	United Nations Conference for Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
Unesco	United Nations Educational, Scientific and Cultural Organization
UNGA	United Nations General Assembly
UNITAR	United Nations Institute for Training and Research
WCP	World Climate Programme (ICSU and WMO)
WCRP	World Climate Research Programme (WCP)
WMO	World Meteorological Organization (UN)
WOCE	World Ocean Circulation Experiment (WCRP)