

IMPLEMENTATION ARRANGEMENT

for the project entitled

EARTH OBSERVATION AND GEOMATICS SUPPORT FOR FLOOD MANAGEMENT AND ENVIRONMENTAL MONITORING IN THE MEKONG RIVER BASIN

under the

MEMORANDUM OF UNDERSTANDING

between

The MEKONG RIVER COMMISSION (MRC)

and

The CANADIAN SPACE AGENCY (CSA)

and

NATURAL RESOURCES CANADA (NRCan)

Represented by the Earth Sciences Sector

The Mekong River Commission, the Canadian Space Agency, and Natural Resources Canada (represented by the Global Opportunities Program of the Earth Sciences Sector), hereinafter collectively referred to as the *Parties*, hereby agree to cooperate in the project set forth in this Implementation Arrangement (including attached Annexes) pursuant to implementation of the above-mentioned project (hereinafter referred to as the *Project*).

1. Scope and Objectives

The *Project* objective is to build upon the Decision Support Tool project, currently being undertaken by Hatfield Consultants Ltd. (Vancouver, Canada) and the MRC's Environment Program (through the Technical Support Division), and to expand this project to incorporate additional components, including flood management, human security, and environmental management. More specifically, the *Project* will assist MRC with the development of web-based systems to enhance the long-term monitoring of annual floods, to improve protection of local populations from flood impacts, and to facilitate monitoring of wetlands and fisheries. It will be designed in a manner to support MRC's needs in terms of information generation and communications, and will include a significant training and capacity building component for MRC and National Mekong Committee staff. The *Project* will be flexible in nature, so that it can provide MRC with a variety of remote sensing and GIS tools required for day-to-day management and monitoring of the environment in the Mekong River Basin.

Central to the *Project* is the development of a web-based information dissemination portal for the Mekong River Commission, a system identified as the MRC-IS Portal – a pilot version of the portal currently developed under the Earth Observation Application Development Program of CSA. The *Project* focuses on use of EO and GIS technologies to assist with information collection and dissemination, and environmental monitoring in the Mekong Basin. A key aspect of the *Project* is to raise awareness and usage of EO technology throughout the MRC.

2. Funding arrangements

As part of the Memorandum of Understanding (MOU), the *Parties* concurred, based on a

selection process conducted by CSA, to implement the *Project* through the award by CSA of a contract (No. 9F028-3-9514) to a Canadian team lead by Hatfield Consultants Ltd., which includes CARTEL at the University of Sherbrooke (Sherbrooke, Canada), Strata360 (Montreal, Canada), and AErde Environmental Research (Halifax, Canada). The award of the contract will be made in accordance with the terms and conditions of the Earth Observation Application Development Program of CSA. As such, Hatfield Consultants Ltd. and partners are expected to contribute \$200,000.00 Cdn dollars to the *Project*. The implementation of the 3-year *Project* will start with the signature of the contract between CSA and Hatfield Consultants Ltd. The value of the *Project* is estimated at \$1,000,000 Cdn dollars.

Activities under this Implementation Arrangement are subject to the availability of appropriated funds to the *Parties*. Should a Party encounter funding problems that may affect its ability to fulfill its responsibilities under this Implementation Arrangement, that Party will notify and consult promptly with the other *Parties*. In case of cost increase, the *Parties* will consult to solve the problem and find the appropriate solution.

2.1 *Funding commitments*

MRC commitments:

MRC will provide an in-kind contribution equivalent to \$300,000 Cdn dollars to the *Project*. As described in the proposal, MRC will make its best efforts to provide:

- Personnel time from MRC Programmes: five professional staff part-time
- Access to existing MRC datasets
- Access to office space, computers / software and other equipment
- Assistance to field logistics
- Other logistical and administrative requirements

CSA commitments:

CSA will contribute up to \$500,000.00 Cdn dollars to the *Project*. CSA awarded a contract (No. 9F028-3-9514) to a Canadian team lead by Hatfield Consultants Ltd. to implement the *Project*. Particularly CSA will:

- Participate in contract negotiation with the selected contractor
- Provide RADARSAT-1 data
- Participate at Kick-off Meeting (St. Hubert, Canada)
- Participate at workshop to review findings from evaluation phase and planning
- Review and approve Progress Report – end of Phase 1
- Attend and provide comments at Review Meeting, Go / No-Go Mid-term Review
- Review and approve Progress Report – end of Phase II, Technical Report
- Attend and provide comments at Final Project Review Meeting
- Participate in Final in-country workshop
- Review and approve Final Report
- Approve deliverables associated with each milestone
- Process milestone claims

5.6 Unanimity

All decisions of the Steering Committee shall be by unanimous agreement of all members.

5.7 Disagreement

Upon request of one Party to the other *Parties* regarding any matter relating to the terms of this *Project*, the *Parties* will endeavor to resolve any problem or misunderstanding by consultation in a spirit of mutual cooperation and trust.

5.8 Amendments

This Implementation Arrangement may be extended or amended by the mutual written agreement of the *Parties*.

5.9 Duration and Termination

This Implementation Arrangement enters into effect on December 1, 2003 and will remain in effect until November 30, 2006 unless terminated or extended. Any Party may terminate its participation under this Implementation Arrangement upon three (3) months written notice to the other *Parties*.

5.10 Publications and communications

Publications and public communications related to activities carried out under this Implementation Arrangement shall be made in a spirit of collaboration, with consultation by all the *Parties*. All publications and public communications relating to such activities shall acknowledge the contribution of the *Parties*.

5.11 Intellectual Property

The *Parties* shall retain all rights and title to their existing proprietary knowledge and Intellectual Property that they bring to the activities conducted under this *Project*. Intellectual Property arising out of or resulting from activities conducted under the *Project* will be governed by the terms of the contract between CSA and Hatfield Consultants Ltd. CSA will require the contractor Hatfield Consultants Ltd, to provide MRC with a royalty free and irrevocable access to Intellectual Property arising out of or resulting from activities conducted under the *Project*.

Done in triplicate and signed

Accepted on Behalf of the MRC by:

Dr. Olivier Cogels
Chief Executive Officer, MRC Secretariat

Signed at Winnipeg on the 6 day of January, 2005

Accepted on Behalf of the CSA by:

Mr. Denis Auger
Program Manager, EOADP Program
Canadian Space Agency

Signed at Montreal on the 9 day of September, 2005.

Accepted on Behalf of NRCan by:

Mr. Jean-Claude Deguise
Program Manager, Global Opportunities Program
Earth Sciences Sector
Natural Resources Canada

Signed at Ottawa on the 26 day of September 2005.

ANNEX 1

STEERING COMMITTEE COMPOSITION

MRC participation

The responsible unit shall be the Environment Division and the MRC Project Coordinator shall be:

Name: Chumnarn Pongsri

Title: Director, Environment Division

Address: MRC Secretariat, P.O. Box 6101, Unit 18 Ban Sithane Neua,
Sikhottabong District, Vientiane 01000, Lao PDR.

Phone: (856) 21 263 263

Facsimile: (856) 21 263 264

Email: chumnarn@mrcmekong.org

or other designated official.

CSA participation

The responsible unit shall be the Commercialization Office, and the CSA Project Coordinator shall be:

Name: Denis Auger

Title: Program Manager, EOADP Program

Address: John H. Chapman Space Centre, 6767 route de l'Aéroport, Saint-Hubert,
Québec, J3Y 8Y9 Canada

Phone: (450) 926 4440

Fax: (450) 926 4449

Email: Denis.Auger@space.gc.ca

or other designated official.

NRCAN participation

The responsible unit shall be the Global Opportunities Program of the Earth Sciences Sector, and the NRCAN Project Coordinator shall be:

Name: Jean-Claude Deguise

Title: Program Manager, Global Opportunities Program

Address: Canada Centre for Remote Sensing, Earth Sciences Sector, 588 Booth Street,
Room 463, Ottawa, Ontario, K1A 0Y7 Canada

Phone: (613) 947 1229

Fax: (613) 947 1385

Email: Jean-Claude.Deguise@CCRS.NRCAN.gc.ca

or other designated official.

ANNEX 2

LIST OF ACTIVITIES

Project:
Earth Observation and Geomatics Support for Flood Management and Environmental Monitoring in the Mekong River Basin

Phase I – Project Design (Oct/03 – Apr/04)

Work Package 1:

Review existing data and projects related to human security in the Mekong Basin.

Hold a planning meeting/kick-off meeting at the MRC with key MRC, CSA, CCRS, and project team staff.

Review work/activities at MRC/FMP as well as with relevant government ministries, development agencies, and NGO's addressing flood management, human security and disaster management issues.

Undertake a needs assessment for EO/GIS data for flood management and monitoring of human environment conditions – consultation workshop:

Conduct workshop/planning meeting session at the MRC's to identify the needs for EO/GIS data for flood management and monitoring with linkages to human security.

Work Package 2:

Needs assessment and evaluation of pilot GIS portal on MRC's intranet and website (EO data).

Monitor and evaluate use of MRC GIS Portal during the initial three months of operation.

Assess EO components, determine which sensors are most useful and which sections should be further developed.

Assess map service components of the portal, identify information gaps and ways to improve functionalities, determine which elements should be further developed.

Following a "Use Case Development and Analysis" process, identify overall information needs, gaps, and requirements.

Conduct workshop/seminar to review findings from the evaluation phase and to plan for the development of an EO awareness Kit.

Provide analysis of barriers to use of EO data within MRC/NMC's.

Phase II – Project Implementation (Apr/04 – Oct/05)

Work Package 3:

Develop human security/flood management component.

Design of the emergency management system diagram following a "system engineering" approach.

Design and development of a database and metadata to support steps in the creation of relevant dataset.

Develop vulnerability maps in relation to flooding, using both EO and GIS datasets, while incorporating existing hydrological models.

Develop a GIS-based health protection emergency system.

Generate land-use maps of the existing healthcare infrastructures.

Work Package 4:

Fine-tune portal functionality and develop additional web-based tools.

Preparatory/planning Activities for the development phase (II) of the project.

Design a semi-automated web interface for EO image acquisition, interpretation and analysis.

Enhance map service components functionality by creating new thematic map services relevant to MRC programmes.

Develop EO based applications to assist the Environment Programme's ongoing Wetlands Mapping project.

Develop new components following MRC's priorities. Include datasets derived from the Social Atlas (BDP), Water Quality Monitoring, Fisheries, etc.

Wrap-up of Development Phase: Workshop Presentation of Expanded Version of Portal with Added-value Analysis Tools.

Phase III – Project Integration (Nov/05 – Nov/06)

Work Package 5:

Integration of MRC GIS Portal, Training, & Project Wrap-up.

Develop a CD-ROM based/web-adaptable EO Awareness Kit package for the Mekong Basin.

Organize workshop on development of EO/Web-based tools for resource management and monitoring.

Enhance training delivery for TSD staff regarding integration of EO data and the maintenance and updating of map service components of portal.

Develop a public access web-based map service to host unrestricted MRC's GIS data.

Final workshop and Reporting.