



MATHEMATICAL MODELLING FOR REAL-TIME FLOOD FORECASTING AND FLOOD CONTROL IN CENTRAL AMERICA

Copenhagen, 8 January 1995
7036/JHM

DRAFT MINUTES OF FOURTH STEERING COMMITTEE MEETING

In Montelimar, Nicaragua, 7 December 1994 has been held the fourth meeting of the Steering Committee of the project "MATHEMATICAL MODELLING FOR REAL-TIME FLOOD FORECASTING AND FLOOD CONTROL IN CENTRAL AMERICA". The meeting was attended by:

The Representative of DANIDA, Mr. Poul Nyborg
The Representative of CEPREDENAC, Mr. Luis Diego Morales
The Regional Coordinator, Mr. Salvador Rodriguez

The National Representative of Costa Rica, Mr. Sadi Laporte (substitute)
The National Representative of El Salvador, Mr. Mario H. Zavaleta
The National Representative of Guatemala, Mr. Luis Ochoa (substitute)
The National Representative of Honduras, Mr. Roberto Dimas Alonzo
The National Representative of Nicaragua, Mr. Luis Palacios
The National Representative of Panama, Ms. Matias Carrera

The Technical Coordinator, Mr. Göran Frederikson (observer to the committee)
The Representative of KTH Mr. Rudolfo Candia (observer to the committee)

The Representative of the Consultants, Mr. Jesper Knudsen and Mr. Jacob Høst-Madsen, DHI

Mr. Pedro Tax, Guatemala, and Mr. Rafael Oreamuno, Costa Rica, was unable to attend the meeting.

0. General introduction

The meeting was opened by Jesper Knudsen, who introduced the proposed agenda. The Progress Report and Plan of Operation No. 3 subject to discussion was sent by courier to the Steering Committee members prior to the meeting.

Luis Diego Morales was elected as chairman of the meeting.

1. Approval of Minutes of the third Steering Committee meeting.

The Minutes of the third Steering Committee meeting enclosed in the Progress Report and Plan of Operation no. 3 were approved by the Steering Committee.

2. Progress and Status of the Project

General report by the Consultant

Jesper Knudsen presented the project activities carried out in 1994. In general the activities have been in close agreement with the work programme for 1994 approved at the third Steering Committee meeting. All planned overseas training activities will be completed by the end of 1994. Through an evaluation the participants of the first overseas training course have concluded that the course objectives have been achieved. The second Regional Workshop was held in San Salvador in May-June 1994 with 26 participants. All computer hardware has been purchased. Final software installations on the second lot of computers will be made during the visit of the Consultant to the Region in January/February 1995. The MIKE 11 modelling software has been upgraded to Windows during 1994. The only planned activity not carried out is a limited support to model applications in the Region. However, through frequent communication to the Region, requested support has been given.

A summary of the main project achievements during the period 1993 - 1994 was given (see enclosed summary).

A number of activities related to the implementation of the telemetry system in Honduras has been carried out in 1994. A technical mission to Honduras was completed in April. An international tendering was completed in July and a contract with the company Handar Inc., USA signed in September. Training of 4 engineers/technicians at the Handar factory is scheduled for December 1994. The equipment will arrive in Tegucigalpa in January 1995. A summary of the main achievements is enclosed these Minutes.

Overall status of Case Studies

Jacob Høst-Madsen gave an overall status of the modelling activities within the Case Study areas. The basic model setup has been almost completed in all Case Study areas and various model applications have been made subsequently.

For the detailed description of each model area please refer to the Progress Report and Plan of Operation no. 3, section 2.6.

Country reports by National Representatives

The six National Representatives gave a brief report of activities carried out in the Region during the last half of 1994.

Costa Rica

Continued work on the Reventazon case study has been carried out. Special emphasis has been given to the model setup at the Cachi reservoir and upstream. Water balance problems have been identified and partly solved. In general the cooperation between the trained counterparts and their institutions has been good. Introduction of MIKE 11 to additional staff at ICE has been initiated.

El Salvador

Additional hydrometeorological data from the Lempa basin have been requested from Guatemala (INSIVUMEH) and Honduras (DGRH). No data have been received until now. The cooperation between DGRN and CEL respectively UCA has been somewhat difficult due to reorganisations at these institutions. An amendment to the Operating Agreement with UCA has been drafted. It should be considered if all Operating Agreements should be revised to define the institutional responsibilities in more details. Initial preparations for short courses have been made.

Guatemala

Additional hydrometeorological and topographical data for the Case Study setup have been prepared and partly received from the project 'Riego y Avenamiento - Ministerio de Agricultura y Ganaderia'. Initial preparations for short courses have been made. There is a sincere interest to have INDE participating in the project. It will allow Juan Jose Sandoval to work more on the project. It is suggested that the project should ask ERIS to allow for allocation of more time for the involved counterparts.

Honduras

Special emphasis has been given to the preparation for the telemetry system which is due to arrive in Honduras in January. Inter-institutional responsibilities have been agreed on. In addition to this activity, DGRH and ENEE have been preparing additional hydrometeorological and topographical data for the Sula Valley model setup.

Nicaragua

Most activities have been related to the rehabilitation of the hydrometeorological network. However,

INETER needs external financial support for the rehabilitation. The FINNIDA project has been approached but cannot provide any support. Only very limited modelling activities have been carried out. Additional data have been sent to the counterparts on training in Denmark. Further modelling activities will await the return of the two trained counterparts from Denmark.

Panama

Continued work on the Rio Chiriqui case study has been carried out. Additional topographical data have been prepared. In general the cooperation between the trained counterparts and their institutions has been good. At IRHE a number of modelling teams have been assigned to apply the modelling technology for other catchments and applications. More installations are required.

General

Jacob Høst-Madsen commented that DHI can see it as a potential risk to the project sustainability that the trained counterparts will leave their present positions and move to more attractive positions. It is important to encourage the counterparts and the institutions to continue the project activities in their present positions.

Sadi Laporte mentioned that the institutional responsibilities should be formulated more clear in special programmes in each country. Salvador Rodriguez commented that the existing Operating Agreements signed by all the institutions already define the responsibilities.

The Steering Committee agreed that the national work programmes which will be prepared in January/February 1995 by the Consultant together with the involved Institutions/Counterparts/National Representatives clearly must define the project activities and specific responsibilities for the institutions.

3. Economical Status

The economic status of the project (Table 5.1 and 5.2 in the report) was outlined by Jesper Knudsen. In general the figures of 1994 are in agreement with the budget. The total expenditures in 1993 and 1994 have been 10.5 mill. DKK. These were estimated at 12.2 mill. DKK in the Project Implementation Plan.

4. Plan of Operation (Jan - Dec 1995)

Jesper Knudsen outlined the main targets for the application and consolidation phase in 1995 and 1996 (see enclosed summary). The project shall:

- Demonstrate actual applications
- Consolidate know-how and experience
- Strengthen the institutional capacity
- Disseminate results to end-users

Jesper Knudsen presented the general work programme (Figure 4.1 in the report).

The detailed Plan of Operation for 1995 will be prepared together with the involved Institutions/Counterparts/National Representatives during a visit of the Consultant to the Region in January/February 1995. The Plan of Operation will include an agreement of (see also enclosed summary):

- Targets
- Activity schedule
- Counterpart input
- Further dissemination
- Support from Consultant

The Plan of Operation for 1995 will take into account the possible recommendations and findings from the Review Mission which is expected to present a preliminary report/debriefing at the start of February 1995 after being three weeks in the Region.

Jesper Knudsen proposed the next steering committee meeting to be held around 1 March 1995 where the prepared Plan of Operation for 1995 could be approved.

The Steering Committee approved the proposed work plan for the elaboration of the Plan of Operation 1995.

Poul Nyborg thanked the National Representatives, CEPREDENAC and the Consultant for the project output achieved until now. Regarding the review mission he mentioned that one of the main objectives of the mission will be to assess the project outputs and the achievements in view of the project objectives defined prior to the project start. Poul Nyborg mentioned he would communicate the programme of the review mission to CEPREDENAC in week 50.

Poul Nyborg discussed the possible future DANIDA support to the Region. DANIDA will probably decrease the future support to regional projects. It is therefore uncertain if support for a possible Phase II can be obtained from DANIDA. He emphasized that DANIDA probably will request a larger institutional contribution in future projects to ensure technical, financial and general institutional sustainability.

Poul Nyborg noted that CEPREDENAC is still not recognised in the Region. Salvador Rodriguez and Luis Diego Morales gave the actual status of CEPREDENAC. They expect that CEPREDENAC will be recognised by the necessary 3 countries before the end of April 1995. ASDI will support the CEPREDENAC office at least until May 1995.

Lunch break

Jesper Knudsen outlined the Plan of Implementation for the telemetry system in Honduras (see enclosed activity schedule).

Jesper Knudsen outlined the budget for 1995 (and 1996), see Figure 5.1 in the report.

Luis Diego Morales asked if any remaining funds e.g. 17.066 DKK in Table 5.2 or 135.983 DKK in Table 5.1 can be used for additional support for the CEPREDENAC secretariate. Jacob Høst-Madsen answered that these money at this stage cannot be seen as remaining funds since the accounting period is 1993-1996 and that a deficit/surplus from one year is incorporated in the budget for coming years.

The Steering Committee approved the budget for 1995.

5. Dissemination of know-how & technology

Jesper Knudsen presented the distributed note 'ANNEX 1: Dissemination of know-how & technology:

ANNEX 1: *Dissemination of know-how & technology*

Background

After the return of the counterparts from the first Training course in Denmark, DHI/CEPREDENAC has received official and unofficial requests for installation of additional MIKE 11 modelling systems at participating institutions as well as from institutions presently not participating in the project.

The principal reason for these requests is an expressed need of the counterparts to involve their colleagues in the further application of the modelling system and initiate in-house training. With access to only one installation per counterpart, the introduction to colleagues is made somewhat difficult due to the necessity of sharing the hardware and software facility.

An expressed need for the installation of additional MIKE 11 systems or a specific requests in this regard have been received from ICE and UCR (Costa Rica), CEL (El Salvador), ENEE (Honduras), UNI (Nicaragua), IRHE and UTP (Panama).

Regarding institutions presently not participating in the project, a request for installation of MIKE 11 has been forwarded by Instituto Nacional de Electrificación (INDE), Guatemala. The request has been made to allow their employee, Ing. Juan José Sandoval (also working part-time in ERIS and been trained in Denmark) to work with the modelling system at INDE also, please refer the enclosed letter.

Interest for participating in the project has also been expressed by Instituto Nicaraguense de Energia (INE).

General Project Strategy

The above requests are very much in line with the Project's interest for dissemination of the technology and further strengthening the capacity of the participating institutions in order to enhance the sustainability of the Project in the long term. The Project should therefore in general support any such initiative, provided that the requests reflect a real need of the institutions and a commitment to actively involve further staff in the use of the modelling system.

The latter is considered important to avoid inappropriate applications of the software. It is essential, therefore, that the installation of additional software packages goes hand in hand with the prospects of building the required competence in its use. New users should hence be required to participate in training courses being offered and should be actively involved in applications of the modelling system under the guidance of the trained counterparts.

The provision of additional software packages has also an economic dimension. In this respect, the MIKE 11 modelling system is a commercially available software package, the income of which allows DHI to ensure its current maintenance and continuous development. As part of the contract for the present Project entered into between Danida and DHI, terms for the transfer of a total of 18 MIKE 11 & HIS software packages have been agreed upon. Therefore, the budget for the Project does not allow installation of additional software packages.

In spite of this, DHI have already accepted to issue 4 further user licenses without extra cost to the Project to fulfil the immediate needs of the increased number of counterparts trained in Denmark (22 in total).

Proposed Actions

Due to the great importance for further strengthening the capacity of the participating institutions, it is proposed to support initiatives for training of further staff and postpone the solution of the economic question involved to a later stage.

The following actions are thus proposed:

- o Participating institutions in need of an additional MIKE 11 installation shall present their request to the visiting consultant of DHI during his visit in January/ February 1995;*
- o Institutions shall provide the required computer and assign adequate staff to be trained in the application of the software;*
- o As part of the preparations of the detailed programme for 1995, the Consultant will review the request, and in case the basic requirements are met he will undertake the installation of the additional software package.*
- o The additional installations will be provided by DHI free of charge for the duration of the Project. At the end of the present phase (1996), the need for upgrading the*

installations to permanent user licences shall be reviewed. The economic conditions shall be agreed with the Steering Committee, and subject to the approval of Danida, payments shall be drawn from the Contingency Fund. In case Danida approves a continuation of the project beyond 1996, payments for the additional installations may instead form part of the negotiated contract between Danida and DHI for Phase II of the project.

Regarding the institutions presently not participating in the project INDE of Guatemala has a part-time employee, Ing. Juan José Sandoval, who has been trained in Denmark. It is expected that INDE will make relevant use of the software, and it is therefore recommended that the Steering Committee approves INDE's request for installation of the MIKE 11 system, assuming that INDE will enter into an inter-institutional agreement with INSIVUMEH to ensure their cooperation related to the project.

It is proposed that the National Representative of Guatemala makes necessary arrangements to have the institutional agreement signed before the arrival of the DHI consultant at the end of January 1995, to allow the installation at INDE at this occasion. Other conditions related to this installation will be identical to those given above.

Interest for getting access to the technology and know-how offered by the project has also been expressed by INE of Nicaragua. Staff from INE has not been trained under this project and hence is in a much more difficult position to absorb the technology. In case INE is willing to assign the necessary staff, however, their involvement should be considered. It is proposed that the National Representative of Nicaragua makes inquiries with INE over their interest and discusses their possible involvement along the lines given above. Final decision on their possible participation could be taken by the Steering Committee in March.

The Steering Committee approved the proposed actions:

- * The interested institutions shall present a request for additional MIKE 11 installations during the visit of the Consultant in January/February 1995 (or earlier).
- * A prerequisite for extra installations is that the institutions provide the hardware and will assign adequate staff for modelling activities.
- * Based on a review of the requests, the Consultant will carry out the extra installations.
- * The extra installations will be provided free of charge for the duration of the present project phase. At the end of 1996 the need for upgrading the installations to permanent user licences shall be reviewed. The economical conditions shall be agreed with the Steering Committee and subject to the approval of DANIDA. Payment shall be drawn from contingency funds or from a Phase II budget.
- * CEPREDENAC will in January 1995 prepare an institutional agreement with INDE. The agreement shall also be signed by INSIVUMEH, ERIS and CEPREDENAC. For information CEPREDENAC will forward a copy to Luis Palacios, INETER, with the aim of forming an agreement with INE. However, final decision of the participation of INE will be taken at the

Steering Committee meeting in March after further investigations by Luis Palacios.

6. Specific Actions Required

Jacob Høst-Madsen outlined the specific actions required:

- * Actions regarding the Third Regional Workshop in September-October, please see enclosed summary.
- * Regarding the 20 % workshop contribution from the Regional Workshop in San Salvador, May-June 1994 6 participants from 4 institutions in Costa Rica, Guatemala and Honduras still have to pay their contribution (240 US \$). The contribution must be payed immediately to the CEPREDENAC office.

The Steering Committee decided that the 20 % contribution for future Regional Workshops must be prepaid.

- * The second set of computers is shipped within this week from Denmark to the Region. Original Airway bills and proforma invoices are also sent to the Region at time of shipment. Custom clearance procedures must be initiated as soon as possible. Please inform DHI by fax if any severe problems are discovered. Please do not open the boxes with the equipment at the receiving institutions (it caused problems in May-June 1994). The final installations will be made in January/February 1995 by the Consultant.

7. Next Meeting

It was decided to schedule the next Steering Committee meeting on 1 March 1995 in Panama.

8. Other Business

No other matters were discussed.

The meeting was closed.

Copenhagen 8 January 1995
Jacob Host-Madsen