DEPARTMENT OF REGIONAL DEVELOPMENT
ORGANIZATION OF AMERICAN STATES

**Natural Hazards Risk Assessment and Disaster Mitigation
Pilot Project in Latin America and the Caribbean Basin**

COURSE ON THE USE OF NATURAL HAZARDS INFORMATION IN THE PREPARATION OF INVESTMENT PROJECTS

VOLUME I: COURSE MANUAL
VOLUME II: COURSE MANUAL ANNEXES

WASHINGTON, D.C.
MAY, 1987

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V O L U M E I

C O U R S E M A N U A L

The Natural Hazards Pilot Project of the Department of Regional Development receives support from the United States Agency for International Development/Office of Foreign Disaster Assistance (USAID/OFDA). This manual is based on two pilot courses presented by the project in Merida, Venezuela, during 1986 with the collaboration of the InterAmerican Center for the Integral Development of Water and Land (CIDIAT).

PRESENTATION AND ACKNOWLEDGEMENTS

The Department of Regional Development (DRD) of the Economic and Social Area, General Secretariat, Organization of American States strives to disseminate the results of its technical cooperation not only to the immediate beneficiaries, but also to other potentially interested agencies and individuals. Based on experiences in direct technical assistance, training and field investigations, the DRD periodically draws together insights and lessons learned to produce technical publications. The present manual addresses the issue of natural hazards, which is of increasing concern to member states. It focuses on training, which is an essential element for dealing with the issue.

Two pilot courses on the use of natural hazards information in the preparation of investment projects and the preparation of this manual were carried out by DRD's Natural Hazards Risk Assessment and Disaster Mitigation Pilot Project in Latin America and the Caribbean Basin. The courses were designed for mid-level project planners to acquaint them with the source and content of natural hazards assessment information and its application in the economic analysis of sectorial investment projects. The manual is a summary guide for future course presentations and describes the organizational, administrative, academic and curriculum aspects of the course.

The DRD wishes to thank the institutions and individuals whose efforts made the pilot courses and this manual possible. Special recognition is due to the InterAmerican Center for Integral Development of Water and Land (CIDIAT) for co-sponsoring the course and for the participation of its staff; to the United States Agency for International Development/Office of Foreign Disaster Assistance for their financial support and sustaining interest; to Los Andes University, the Special Commission for the Prevention of Seismic Risks of the State of Merida, Venezuela, the United States Geological Survey and the World Meteorological Organization for their donation of staff time and documents; and to the Government of Venezuela for its scholarship support.

Among the numerous individuals who participated, Earl Brabb, Oswaldo Cabello, Mirella Escalante, William Kockelman, Carlos Lopez Ocana, Medardo Molina, Peggy Quijada, and Rosa Ramirez deserve special mention. The pilot courses and

manual were completed under the direction of Stephen Bender. Roger Amisial served as coordinator of activities between the DRD and CIDIAT. The coordination of the pilot courses and the drafting of the manual were carried out by Boris Utria. The coordination of the pilot courses for CIDIAT was carried out by Ricardo Smith and Jose Perez Roa. DRD senior specialists Salvador Archondo and Richard Saunier participated in the design and presentation of the courses. Enrique Bello prepared the translation and production of the manual.

Kirk P. Rodgers
Director
Department of Regional Development

COURSE ON THE USE OF NATURAL HAZARDS INFORMATION IN THE PREPARATION OF INVESTMENT PROJECTS

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INTRODUCTION

During 1983, in response to the increasing requests by its member states, the Area for Economic and Social Affairs, General Secretariat of the Organization of American States through its Department of Regional Development (DRD) and with support from the United States Agency for International Development/Office of Foreign Disaster Assistance (USAID/OFDA) initiated the "Natural Hazards Risk Assessment and Disaster Mitigation Pilot Project in Latin America and the Caribbean Basin" (NHP).

The principal objective of the NHP is to promote the use of natural hazards information in the integrated development planning process and the mitigation of disasters in the OAS member states. Although the dissemination of such information through formal training courses was not included among the initially programmed activities of the NHP, the project's rapidly accumulated field experience made evident the need to train professionals in the subject matter. Upon verifying the absence of relevant training programs in terms of orientation, content and instructional language, the NHP obtained in 1985 additional support from USAID/OFDA to develop a course on the use of natural hazards information in the preparation of investment projects. The process of designing, testing and revising the course curriculum was carried out through two pilot courses presented in Merida, Venezuela in 1986 in collaboration with the InterAmerican Center for the Integral Development of Water and Land (CIDIAT). Both pilot courses were successfully completed and provided training to a total of 42 professionals from 18 Latin American and Caribbean countries.

This manual is a result of that effort and is intended as a guideline document. It has been designed to provide prospective sponsoring institutions with necessary information to program and present national or regional courses on the use of natural hazards information in the preparation of investment projects. While the course curriculum presented in this manual draws from the two pilot courses that where presented in Merida and thus has a particular scope and orientation, it is expected that the manual will be of value in subsequent natural hazards and development planning courses. The manual not only provides comprehensive information about the organizational and administrative aspects involved in presenting such courses, but also provides a working structure upon which to design a course suited to the sponsoring organization's needs.

The present format, content, and orientation of the course, as presented in this manual, have the following general and specific training objectives:

General objectives:

i.- To create an awareness among Latin American and Caribbean professionals of the importance of considering natural hazards in the integrated development planning process.

ii.- To provide training on the use of natural hazards information in the preparation of sectorial investment projects to mid-to-high level professionals on a national and/or interAmerican basis.

Specific training objectives:

i.- Provide information to the participants concerning the sources and types of existing natural hazards information.

ii.- Train the participants in the identification, collection, generation, and technical analisis of specific natural hazards information.

iii.- Train the participants in economic and social analysis of the possible impact of specific natural and corresponding disaster mitigation measures.

iv.- Train the participants in the use of specific natural hazards information in the integrated development planning process and governmental decision making.

v.- Train the participants in the use of specific natural hazards information in the formulation and evaluation of investment projects.

vi.- Train the participants for work in the subject of natural hazards management in multi-disciplinary groups.

The course covers a program of four weeks duration which includes approximately 85 hours of formal instruction, 25 hours of classroom exercises and 30 hours of technical field trips. The formal instructional component includes thematic units of a technical-scientific nature covering relevant natural hazards in the countries of the two regions, thematic units covering methods and techniques for the analysis of natural hazards information, and thematic units covering the formulation and evaluation of investment projects. The classroom exercises component includes the execution of activities covering specific analytical methods and techniques, and the development of a final course case study. The technical field trip component includes visits to observe the presence of specific natural hazards and to the subject area of the final course case study.

This manual is organized in two volumes and in a modular fashion to facilitate its use in the different aspects involved in staging a course. **VOLUME I: COURSE MANUAL** presents the complete course and is divided into three parts. The first part, Organizational and Administrative Aspects, presents a summary of key aspects and recommendations for the organization of the course. The second part, Principal Academic Aspects, presents a summary of relevant academic norms and procedures. Finally, the third part, Course Curriculum, presents a detailed description of all the academic units of the course, and provides information on each unit's content, suggested classroom/homework exercises, recommended instructor's readings, additional instructional materials, additional suggested bibliography, and sample exam questions. **VOLUME II: COURSE MANUAL ANNEXES** contains selected supporting material for the different sections of Volume I.

PART I.- ORGANIZATIONAL AND ADMINISTRATIVE ASPECTS

PART I.- ORGANIZATIONAL AND ADMINISTRATIVE ASPECTS

This part of the manual is divided into nine sections which contain the principal organizational and administrative aspects of the course, and presents guidelines and recommendations to assist in the planning and staging of the course.

1.- SELECTION OF COURSE SITE:

In selecting a site for the course it is recommended that the principal criteria be the existence of an academic institution or a government planning agency that can assume a sponsorship role and assume all planning and operational responsibilities in the presentation of the course. In addition to that criteria it is suggested that the following guidelines be taken into consideration:

a.- Overall logistic considerations

1.- availability of classroom installations
2.- availability of housing accommodations
3.- availability of local transportation and communications systems
4.- linkages to regional and national transportation and communications systems
5.- availability of office services (secretarial support, supplies, reproduction, etc.)
6.- availability of medical facilities

b.- Academic support considerations

1.- proximity to a university with strong natural and physical sciences program
2.- availability of research/library facilities
3.- availability of qualified local professionals that can participate as course instructors and/or case study resource personnel

c.- Natural hazards, local climate, and course case study considerations

1.- existence of observable local natural hazards phenomena
2.- existence of moderate climatic conditions (at least during the duration of the course)
3.- proximity to the site of the course case study

It is also recommended that any course site, field trip location, facilities and personnel considered for the course be visited by the principal sponsor and/or organizing institution prior to making any final decision.

2.- SELECTION OF COURSE DATES:

The selection of dates for presenting the course should be done observing the local activities calendar (holidays, elections, carnivals, etc..) to ensure that non-conflicting dates are chosen. If the course is to be offered to government officials on a region-wide basis it is recommended not to present the course in the first quarter of the (fiscal and/or calendar) year as government officials from most Latin American and Caribbean countries will not be able to obtain travel clearances until national budgets and operations programs have been approved. The course should be offered at least once every two years in order to form a cadre of course alumni and cover training needs presented by turnovers in staffing.

3.- SELECTION, CONTRACTING AND TRAVEL ARRANGEMENTS OF COURSE INSTRUCTORS AND RESOURCE PERSONNEL:

While it is expected that the selection and contracting of instructors for the course will be subject to the policies and procedures of the sponsoring institution, it is recommended that their selection and contracting be done observing the following guidelines:

a.- Staffing needs

The number of instructors and resource personnel for the course should be limited to a maximum of 10 professionals. The reasons for this are the necessity to minimize problems in the coordination and orientation of the course, maximize the interaction between instructors and participants, and, minimize costs.

b.- Professional qualification requirements

1.- academic credentials on the subject to be presented
2.- practical experience on the subject to be presented
3.- general and specific teaching experience

c.- Selection and contractual options for course instructors

Based on the experience of the first two pilot courses, it is recommended that the maximum use possible of local and regional instructors be suplemented by national and international professionals. The reasons for this are to encourage the establishment of a local cadre of instructors for continued course offerings, take advantage of local experiences, and simplify course management. Sponsor institutions, however, are urged to pay special attention to each country's particular regulations on the hiring of government and universities employees, and on the different programs for inter-institutional cost-free loan of professionals between government officials and university faculty and special non-profit training programs and/or international technical assistance programs. In general, the basic contractual options that are most likely to be found are:

1.- consultancy contracts with individual professionals
2.- inter-institutional agreements with professionals; and,
3.- participation of professionals from local co-sponsoring institutions

It is further suggested that the selection and confirmation of instructors be finalized at least three months in advance of the starting date of the course in order to allow instructors ample time to prepare their presentations. All participating instructors should be provided with a complete course curriculum (**Part III** of this manual) so that they can have detailed information as to the course objectives, contents and orientation.

d.- Travel arrangements for course instructors

It is recommended that all necessary travel arrangements (visas, tickets, terminal expenses, hotel reservations, etc.) be completed either by the sponsoring institution or by a collaborating organization. The direct remittance of money to instructors to arrange their own travel is an alternative.

4.- IDENTIFICATION, SELECTION AND TRAVEL ARRANGEMENTS OF COURSE PARTICIPANTS:

While it is expected that the selection of participants and processing of all the necessary arrangements for their participation in the course will be subject to the policies and procedures of the sponsoring institution, it is recommended that the following guidelines be observed:

a.- Enrollment

The number of participants in any course should be limited to a maximum of 24 professionals. The reasons for this are the necessity to maximize the interaction between instructors and participants, maximize the individual participation and assimilation of the participants in the lectures and workshop sessions, and minimize problems in the organization and execution of the course.

b.- Course announcement

A key factor in attracting qualified candidates to the course will be the timely announcement of the course and the distribution of application materials. Course announcements should include the necessary information about the content and orientation of the course, general conditions and requirements, scholarship terms (if applicable), and other relevant issues. If the course is to be offered on a region-wide basis, it is recommended that the announcement be published at least six months prior to its initiation date. It is suggested that the announcement of the course be done through the following channels and media:

1.- national offices or official contacts of the sponsoring institutions
2.- national, regional, and local government development planning and sectorial agencies
3.- national, regional, and local natural hazards research agencies and institutes
4.- national, regional, and local universities
5.- natural hazards, natural resource and development planning, and specialized natural sciences magazines and publications
6.- international development assistance agencies

c.- Selection criteria

The selection criteria that were used in the first two pilot courses, and that are recommended for future course offerings are:

1.- candidates must have a university degree;
2.- candidates must have five to seven years of practical experience at a mid-to-high level position with a governmental sectorial, regional or national development planning agency;
3.- candidates must have basic project formulation and evaluation experience or a solid technical background in project identification and preparation.
4.- participants must be in good physical and mental health; and,

as an optional requirement,

5.- selected candidates must prepare and submit a brief case study paper on a natural hazards issue of relevance in their respective countries covering one of the following three topics:

1.- assessment of natural hazards as part of the investment project formulation process;
2.- formulation of a specific project which includes the selection and evaluation of natural hazards mitigation measures; and,
3.- analysis of a natural hazard event, the analysis of the adopted post-disaster mitigation measures, and the formulation of a reconstruction program.

In addition to the above individual selection criteria, it is recommended that the following general criteria be observed:

1.- the group of selected participants should form a balanced multi-disciplinary group, including natural, economic and social sciences, in as far as the participants meet the above individual criteria. To the extent possible, participants should include those responsible for setting hazard mitigation policies.
2.- unless the course is intended as an international course, the group of selected participants should represent a balanced cross-section of local sub-national and national agencies.

d.- Travel arrangements

It is recommended that all travel arrangements (visas, tickets, terminal expenses, hotel reservations, etc.) be done either by the sponsor or co-sponsoring institution. The direct remittance of money to participants to arrange their own travel is not recommended.

e.- Medical insurance

It is recommended that medical insurance be provided either by the sponsor or co-sponsoring institution. The direct remittance of money to participants to arrange their own insurance coverage is not recommended.

f.- Disbursement of scholarships

If applicable, it is recommended that the disbursement of scholarship funds for subsistence be done at the time of registration at the course.

5.- COURSE CASE STUDY MATERIAL:

Based on the experience of the two first pilot courses, it is considered essential that the case study to be used in the course be developed around a real development project in the geographical area where the course is to take place. The reasons for this are the necessity to combine theoretical information with practical field observations, and the necessity to have sufficient information and resource persons with first-hand experience on the project.

In the two first pilot courses, the case study used was the proposed "Merida Massive Transport System -M.M.T.S.," which, if built, would be subject to the natural hazards of the area. While much discussion exists at the local level on whether sufficient research has been done to assess the hydrologic and geologic hazards present, the necessary investment and the multisectorial economic development benefits that are attributed to it presented an interesting scenario to test the assimilation of natural hazards information and project formulation skills of the participants.

In that context it is recommended that the selection of a case study for the course observe the following guidelines:

a.- Recommended case study topics

1.- agroindustrial projects and support infrastructure with critical rural, agricultural and economic (regional/national) development implications:

1.1.- large scale food production systems
1.2.- large scale water management and irrigation systems
1.3.- regional food storage systems
1.4.- regional highway infrastructure

2.- industrial projects with critical social and economic (regional/national) development implications:

2.1.- labor-intensive basic industry complexes
2.2.- high cost capital-intensive industrial complexes
2.3.- industrial complexes for the production of critical export products
2.4.- industrial complexes for the production of capital goods

3.- energy sector projects with critical social and economic development and national self sufficiency implications:

3.1.- hydro-electric power plants
3.2.- thermal and nuclear power plants
3.3.- petroleum refineries
3.4.- fuel storage facilities

4.- service sector projects with critical social and economic development implications:

4.1.- large and medium scale medical facilities
4.2.- large and medium scale educational facilities
4.3.- high cost essential communications facilities

5.- high cost transport systems and infrastructure with critical urban and economic development implications:

5.1.- national and international airports
5.2.- fixed rail mass transit systems
5.3.- sea and river ports
5.4.- regional and national highways

b.- Basic information to be gathered about the case study project and supplied to participants

1.- financial project data:

1.1.- capital investment
1.2.- detailed project cash-flow
1.3.- financing sources and conditions
1.4.- operating expenses

2.- technical project data:

2.1.- physical lay-out of structures and buildings
2.2.- engineering specifications
2.3.- equipment and machinery
2.4.- operating systems and procedures
2.5.- power and fuels supplies

3.- economic project data:

3.1.- benefits (local,regional and national)
3.2.- costs (local,regional and national)
3.3.- externalities

4.- social project data:

4.1.- benefits (local,regional and national)
4.2.- costs (local,regional and national)
4.3.- externalities

c.- Natural hazards information to be gathered about the case study area and supplied to participants

1.- general data (applicable to all case studies):

1.1.- natural resources
1.2.- geographic characteristics
1.3.- climatic characteristics
1.4.- special local features

2.- general atmospheric and hydrologic hazards information (when applicable):

2.1.- event information
2.2.- hazards information
2.3.- risk information
2.4.- vulnerability information

3.- flood hazard information (when applicable):

3.1.- event information
3.2.- hazards information
3.3.- risk information
3.4.- vulnerability information

4.- geologic hazards information (when applicable):

4.1.- event information
4.2.- hazards information
4.3.- risk information
4.4.- vulnerability information

5.- other hazards information (when applicable):

5.1.- event information
5.2.- hazards information
5.3.- risk information
5.4.- vulnerability information

d.- Case study structure and schedule

The case study should be structured in two different phases: (1) initial case study presentation to course participants; and, (2) case study development by course participants.

The first phase should total no more than six hours of formal presentation time, and another six hours of field visits. The second phase of the case study should cover a minimum of ten hours of consecutive supervised workshop sessions. It is suggested that the following schedule totalling a minimum of 24 hours be adhered to:

1st. week: 1 hour presentation lecture
6 hours field trip (Saturday)

2nd. week: 1 hour presentation lecture

3rd. week: 1 hour presentation lecture

4th. week: 1 hour presentation lecture
14 hours case study development

While field visits to the case study site are considered essential during the first phase of the case study, further field trips during the second phase are optional.

e.- Case study coordination and resource people

The case study should be coordinated by one of the instructors of the course. Preference should be given to instructors that will participate in the entire course.

The presentation and development of the case study should be supported by local professionals who have first-hand knowledge of the project, and who can act as resource persons. It is recommended that these professionals be directly involved in the project and, as needed, be supplemented by professionals from local universities (faculty members) and from government planning and sectorial agencies.

f.- Case study working groups

The case study should be developed through the establishment of multidisciplinary working groups drawn from the participants in the course. These groups should be formed by the beginning of the second week so that they have at least three weeks to carry out the necessary research, preliminary discussions, and progressive preparation of the required case study group report.

g.- Case study evaluation

It is recommended that the participants' performance in the case study be evaluated through the preparation of written group reports and oral presentations. The actual contents of the written reports should be defined according to the particular case study and the resource material made available, but a fairly detailed document should be required from the different groups. The oral presentations should be brief in nature and limited to the presentation of each group's conclusions and recommendations, followed by a discussion with all participants.

6.- TECHNICAL FIELD TRIPS:

It is recommended that technical field trips in which participants can observe natural phenomena and their development implications be used to supplement theoretical material and classroom work of the course. While additional field activities are optional, a one day technical field trip directly related to the course case study and a more extensive weekend field trip focusing on several natural hazards are recommended.

In addition to a one day technical field trip to the site(s) associated to the Merida Massive Transport System case study, the two first pilot courses included a major two and a half days technical field trip in which participants travelled to the central flatlands of the country to observe a regional flood control system that covers some 25 000 hectares of extension. During the trip to and from the flatlands, the course participants had the opportunity to observe various natural hazard prone areas (seismic faults, landslides and mass-movements) in the Andean range.

It is suggested that the technical field trips, and particularly the major trip, be carried out within the course structure observing the following guidelines:

a.- Organizational aspects

1.- The sponsoring institution should be completely responsible for the organization of the field trips.
2.- The course instructors of the relevant thematic units should participate in the field trips.
3.- The field trip leaders should be local professionals with first-hand knowledge of the area and the natural hazard problems.
4.- The participants should receive a briefing prior to the field trips which emphasizes on the observable natural hazards and the development planning issues of the trips.
5.- The participants should receive a briefing on the form and content of the required field trip reports.

b.- Natural hazards considerations (major field trip)

1.- existence of major observable natural hazards conditions
2.- existence of economic and human activities in the areas to be visited
3.- existence of some type of mitigation programs or measures (projected or already in place)

c.- Logistic considerations

1.- easy accessibility of the area to be visited
2.- safe and healthy environment
3.- existence of adequate accommodations and food supplies (major field trip)

7.- COURSE BUDGET:

Due to the differences that exist in terms of costs in the different countries, it is not possible to predetermine an overall budget for proposed course offerings. Likewise, the number of participants and instructors, and the characteristics of the field trips will affect the total course cost. In spite of such differences in costs the following items can be pointed out as being the main budget components:

a.- Participants

1.- travel and terminal expenses
2.- subsistence allowance

b.- Instructors (contracted)

1.- honorarium
2.- travel and terminal expenses
3.- per-diem allowance

c.- Training activities and instructional material

1.- administrative and organizational expenses
2.- photocopying
3.- field trips
4.- telephone and telex

Annex I.6.1 presents a detailed sample budget sheet for use in planning the course.

8.- HANDLING OF INSTRUCTIONAL MATERIALS AND DOCUMENTS FOR DISTRIBUTION

The adequate handling and distribution of instructional materials and handouts is an important component of the course. Materials and documents for distribution should be submitted by instructors and participants (individual case studies) which should be reviewed and reproduced. The following guidelines for the handling of such materials and documents are recommended:

a.- Instructional materials

1.- Instructors and resource persons should submit materials for distribution at least one week before their respective presentations or workshops take place.

2.- Instructors and resource persons should be required to submit material following a predetermined format to facilitate handling and reproduction.

b.- Participants' individual case studies

1.- Participants should be requested to submit their respective individual case studies during registration at the beginning of the course.
2.- Participants should be requested to submit their respective individual case studies following a predetermined format to facilitate revision and reproduction.

9.- GENERAL ORGANIZATIONAL SCHEDULE:

The presentation of the course will require the execution of a number of programming activities which will have to be coordinated and completed in a timely fashion. While the specific components of that organizational process will tend to vary with the course structure, site and dates, Table 1 presents a general schedule to be used as a guideline.

TABLE 1.- GENERAL ORGANIZATIONAL COURSE SCHEDULE

ACTIVITIES	PLANNING HORIZON BEFORE THE COURSE STARTS (months)												
	12	11	10	9	8	7	6	5	4	3	2	1	0
Identification of course objectives and content				XXXXXX									
CDU Identification of potential course sites				XXX	XXX								
RS Visits and selection of course site					XXXXXX	XXX							
E Identification, visits and selection of course field trip sites					XXXXXX	XXX							
Final definition of course objectives and content						XXXXXX							
IN Identification of instructors					XXXXXX	XXXXXX	XXXXXX	XXXXXX					
ST Selection of instructors								XXXXXX	XXXXXX				
.I Travel and hotel arrangements (a)										XXXXXX			
PA Course announcement						XXXXXX	XXXXXX	XXXXXX	XXX				
RT Candidate application (b)							XXX	XXXXXX	XXX				
IC Selection of participants (b)									XXXXXX				
IP Notification to participants (b)										XXX			
.E Travel and hotel arrangements (a)										XXXXXX	XXX		
MA Instructors' lecture materials											XXXXXX	XXXXXX	
TE Other materials (videos, films, etc.)											XXXXXX	XXXXXX	
RI Handouts revision and editing											XXXXXX	XXXXXX	
AL Participant case studies											XXX	XXXXXX	
S Reproduction of materials												XXXXXX	

Notes: (a) Subject to the tourist/holiday schedule of the course site city.
(b) Subject to the course being national or regional, and to whether participants will be required to present a case study.

SUMMARY OF THE ANNEXES TO PART I (*)

I.6.1.- Course Budget Format Sample

Note:(*) Refer to **VOLUME II: COURSE MANUAL ANNEXES**

Numeration of annexes corresponds to the specific section to which they are related and, thus, the numeration used will not necessarily be consecutive.

PART II.- PRINCIPAL ACADEMIC ASPECTS

PART II.- PRINCIPAL ACADEMIC ASPECTS

This part of the manual is divided into two sections which contain the principal academic aspects of the course, and is intended as a guide to assist in the organization and determination of academic standards for the course.

1.- ACADEMIC NORMS:

While it is expected that the implementation of a set of academic norms will be subject to existing policies of the sponsoring institution, it is recommended that the following guidelines be observed:

a.- Individual participation

Participants are expected to actively participate on a full-time basis in all the activities of the course, including the preparation of homework assignments, classroom presentations and exercises, field trips, examinations and the course case study.

b.- Course completion (evaluation of participants)

The approval of the course, and thereby the granting of an "APPROVAL CERTIFICATE" to an individual participant should be subject to the following conditions:

1.- attendance at no less than 90 percent of all course activities; and,

2.- obtaining at least a 75 percent grade point average for the four examinations, graded homework, trip reports, and case study workshop.

Participants who do not meet the class attendance criteria but who have a 75 percent or above grade point average should be entitled to receive a "PARTICIPATION CERTIFICATE."

Participants who meet the 90 percent class attendance criteria but who have a grade point average between 50 and 75 percent should also be entitled to receive a "PARTICIPATION CERTIFICATE."

Participants with less than a 50 percent grade point average should not be entitled to a course certificate.

2.- COURSE EVALUATION BY PARTICIPANTS:

While the sponsoring institutions might already have a course evaluation systems, the following evaluation system and questionnaires are recommended for use in the course:

a.- Evaluation system

The proposed evaluation system is composed of two questionnaires. The first one is to be completed by participants at the end of the second week of the course, and the second one at the end of the course. Dividing the evaluation process in two separate units is recommended as a means to achieve a greater clarity in the evaluation process.

b.- Evaluation questionnaires **(See Annex II.2.1).**

3.- CLASS SCHEDULE:

While it is expected that future proposed courses will undergo changes in structure and sequence to accommodate special country and/or regional interests, **Table 2** presents a class schedule as a basis for course planning.

Note should be made with respect to the lecture hours devoted to the "presentation of participant's case studies" (See **Table 2**). These units are included in the proposed course schedule but are not presented in the COURSE CURRICULUM section of this manual **(Part III)**. The reasons for that is that they do not constitute formal lectures, and that requiring case studies from participants is an optional feature within the recommended course "core requirements."

TABLE 2.- RECOMMENDED CLASS SCHEDULE

"sponsoring institution" "co-sponsoring institution"

COURSE ON EVALUATION OF NATURAL HAZARDS INFORMATION IN THE PREPARATION OF INVESTMENT PROJECTS

City, Country (date)

* * * * C L A S S S C H E D U L E * * * *

F i r s t W e e k

time	MONDAY (mm/dd)	TUESDAY (mm/dd)	WEDNESDAY (mm/dd)	THURSDAY (mm/dd)	FRIDAY (mm/dd)	SATURDAY: (mm/dd)
8:00						
	Registration					
9:00				Introduction		F
				to geologic		I
9:05		Environmental		hazards		E
		management	Flood hazards		Seismic and	L
10:00	COURSE	and natural		(Unit #6)	volcanic	D
	INTRODUCTION	hazards	(Unit #5)		hazards	
10:15				Seismic and		
	(Unit #1)	(Unit #3)		volcanic	(Unit #7)	T
11:15				hazards		R
						I
						P
14:00						
15:00						I
		Atmospheric	Flood hazards	Seismic and	WEEKLY	
15:05	Natural hazards:	and hydrologic:		volcanic	EXAM	
	and the process:	hazards:	(Unit #5)	hazards		(Unit #9):
16:00	of integrated	drought and				
	development	desertification:		(Unit #7)		
16:15	planning		Presentation		Course case	
			of participant		study - Part I	
17:15	(Unit #2)	(Unit #4)	case studies		(Unit #8)	

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TABLE 2.- RECOMMENDED CLASS SCHEDULE (Cont.)

"sponsoring institution" "co-sponsoring institution"

COURSE ON EVALUATION OF NATURAL HAZARDS INFORMATION IN THE PREPARATION OF INVESTMENT PROJECTS

City, Country (date)

* * * * C L A S S S C H E D U L E * * * *

S e c o n d W e e k

time	MONDAY (mm/dd)	TUESDAY (mm/dd)	WEDNESDAY (mm/dd)	THURSDAY (mm/dd)	FRIDAY (mm/dd)
8:00					
9:00			Multiple geologic hazards and lifeline network mapping (Unit #12)	Multiple geologic hazards and lifeline network mapping (Unit #12)	Natural hazards information systems and sources (Unit #13)
9:05	Mass-movement hazards (Unit #10)	Land use and soil degradation hazards (Unit #11)			
10:00					
10:15					First course evaluation by participants
11:15					
14:00			Multiple geologic hazards and lifeline network mapping (Unit #12)		
15:00	Land use and soil degradation hazards (Unit #11)	Land use and soil degradation hazards (Unit #11)		Natural hazards information systems and sources (Unit #13)	WEEKLY EXAM
15:05					
16:00					
16:15	Presentation of participant case studies	Presentation of participant case studies	Presentation of participant case studies		Course case study - Part II (Unit #14)
17:15					

rev. x - mm.dd.yy

TABLE 2.- RECOMMENDED CLASS SCHEDULE (Cont.)

"sponsoring institution" "co-sponsoring institution"

COURSE ON EVALUATION OF NATURAL HAZARDS INFORMATION IN THE PREPARATION OF INVESTMENT PROJECTS

City, Country (date)

* * * * C L A S S S C H E D U L E * * * *

T h i r d W e e k

time	MONDAY (mm/dd)	TUESDAY (mm/dd)	WEDNESDAY (mm/dd)	THURSDAY (mm/dd)	FRIDAY (mm/dd)	SAT./dd SUN./dd
8:00						
9:00	Economic planning and natural hazards (Unit #15)	General economic analysis theory (Unit #17)	Project formulation and natural hazards (Unit #19)	Project formulation and natural hazards (Unit #19)	Technical field trip II briefing (Unit #21)	F I E L D
10:00						
10:15	Multicriteria Analysis (Unit #16)				(10:15 - 12:15) WEEKLY EXAM	T R I P
11:15						
14:00						
15:00		General economic analysis theory (Unit #17)	Project formulation and natural hazards (Unit #19)			I I
15:05	Multicriteria analysis and integrated development planning (Unit #16)			Review of probability theory (Unit #20)	TECHNICAL FIELD TRIP II (Unit #22)	(Unit #22)
16:00						
16:15		Course case study-Part III (Unit #18)	Presentation of participant case studies			
17:15						

rev. x - mm.dd.yy

TABLE 2.- RECOMMENDED CLASS SCHEDULE (Cont.)

"sponsoring institution" "co-sponsoring institution"

COURSE ON EVALUATION OF NATURAL HAZARDS INFORMATION IN THE PREPARATION OF INVESTMENT PROJECTS

City, Country (date)

* * * * C L A S S S C H E D U L E * * * *

F o u r t h W e e k

time	MONDAY (mm/dd)	TUESDAY (mm/dd)	WEDNESDAY (mm/dd)	THURSDAY (mm/dd)	FRIDAY (mm/dd)
8:00					Final course evaluation by participants
9:00					
9:05	Natural hazards and project evaluation (Unit #23)	Natural hazards and project evaluation (Unit #23)	COURSE CASE STUDY WORKSHOP (Unit #24)	COURSE CASE STUDY WORKSHOP (Unit #24)	
10:00					
10:15					
11:15					
14:00					CLOSING SESSION
15:00					
15:05	Natural hazards and project evaluation (Unit #23)	COURSE CASE STUDY WORKSHOP (Unit #24)	COURSE CASE STUDY WORKSHOP (Unit #24)	WEEKLY EXAM	
16:00					
16:15					
17:15					

rev. x - mm.dd.yy

SUMMARY OF THE ANNEXES TO PART II (*)

II.2.1.- Course Evaluation Questionnaires

Note:(*) Refer to **VOLUME II: COURSE MANUAL ANNEXES**

Numeration of annexes corresponds to the specific section to which they are related and, thus, the numeration used will not necessarily be consecutive.