

Provision of Flood Early Warning to Flood Vulnerable Communities in the Lower Mekong River Basin Phase 1: Cambodia and Lao PDR

Funded by:

*United States Agency for International Development/
Office of the Foreign Disaster Assistance (USAID/OFDA)*

Executed:

by the Mekong River Commission (MRC)

Implemented:

*by American Red Cross (Amcross) in partnership
with Cambodian Red Cross (CRC) and Action Contre la Faim (ACF)*

Report of the Final Evaluation

Evaluation Team

Mrs. Manel Jayamanna International Consultant/Team leader
Email manelja@sltnet.lk or chitra_manel@yahoo.com

Mr. Ven Sarith Member
Email: vensarith@yahoo.com

Mr. Chheav Nak Member
Nak.ncdmewn@everyday.com.kh or cheavnak@yahoo.com

Mr. Duch Sam Ang Member
Email: dsamang@yahoo.com

Ms. Sandrine Roussy Member

Miss. Suong Leakhena Translator

09 April 2007

Acknowledgements

I wish to express my sincere thanks first to Mekong River Commission Secretariat for inviting me to undertake this self-fulfilling task of evaluating the project of Provision of Early Warning Systems to Flood Vulnerable Communities in the Lower Mekong River Basin. I would fail in my duty if I do not pay my gratitude to USAID/OFDA who recognized me as a consultant and approved my participation in this important exercise as the Team Leader and the International Consultant. I was fortunate to have met Mr. Richard Paulson, Principal of Water-Resources and Flood-Management Consulting LLC who had been involved in the Project from the very conceptual stage up to its implementation. His insights into the spirit and mindset behind the project design were of tremendous value to assess what has been achieved in the project for which I shall be very grateful.

The work of the evaluation would not have been an easy task if not for the cooperation extended by the officials of Department of Hydrology and Water Research (DHRW), National Committee for Disaster Management (NCDM), Provincial Committees for Disaster Management (PCDM), Commune Committees for Disaster Management (CCDM), American Red Cross (ARC), Cambodian Red Cross (CRC), Action Contre la Faim (ACF) and the Red Cross Volunteers (RCVs) based at the village level. Their contribution for the evaluation is appreciated with thanks. The Evaluation Team salutes the village level people and communities who accommodated our visits with pleasure and shared their views very frankly which enabled the Team to gather highly relevant and pertinent information which enriched the quality of findings incorporated in the text of this report.

I am particularly grateful to Mr. Nguyen Huy Dzung Program Officer and Mr. Vandy Khim Program Secretary of Mekong River Commission (MRC) for facilitating my travel to and within Cambodia and providing excellent support and other logistical assistance to Evaluation Team.

My gratitude goes to Mr. Chheav Nak, Mr. Duch Sam Ang and Mr. Ven Sarith the members of the evaluation team for their support in understanding the project in detail, in collecting data and information on the project accomplishments and providing inputs and suggestions to prepare the final evaluation report.

I am particularly grateful to Miss. Suong Leakhena the Translator/ Administrative Assistant who worked tirelessly during the entire evaluation process.

The opinions expressed in this report are those of the Final Evaluation Team who collectively discussed and agreed on all aspects of the evaluation. However as the Team Leader and International Consultant who is entrusted the responsibility of preparing the final report, I accept full responsibility for all errors and omissions.

Mrs. Manel Jayamanna
Team Leader & International Consultant
407/31, Samagi Mawatha, Udahamulla, Nugegoda, Sri Lanka
09 April 2007

List of Acronyms and Abbreviations

ACF	Action Contre la Faim
ADPC	Asian Disaster Preparedness Center
ARC	American Red Cross
CA	Cooperative Agreement
CBDRM	Community Based Disaster Risk Management
CCDM	Commune Committee for Disaster Management
CRC	Cambodian Red Cross
DCDM	District Committee for Disaster Management
DHRW	Department of Hydrology and River Works
EWS	Early Warning Systems
FMMP	Flood Management and Mitigation Program
FMMS	Flood Management and Mitigation Strategy
FMMSIP	Flood Management and Mitigation Strategy Implementation Program
GIS	Geographic Information Systems
LMB	Lower Mekong Basin
MRC	Mekong River Commission
MDRD	Mainstreaming Disaster Risk Management in Development
NCDM	National Committee for Disaster Management
PCDM	Provincial Committee for Disaster Management
PSC	Project Support Committees
SOW	Scope of Work
UDRM	Urban Disaster Risk Management.
USAID/OFDA	United State Agency for International Development /Office of the Foreign Disaster Assistance

Executive Summary

United State Agency for International Development /Office of the Foreign Disaster Assistance (USAID/OFDA) and Mekong River Commission (MRC) under the Cooperative Agreement (CA) signed on 16 December 2002 provided U.S.\$ 1,250,000 in support of the project titled “Provision of Early Warning Systems (EWS) to Flood Vulnerable Communities in the Lower Mekong River Basin”.

Flooding has been part of the Mekong River’s seasonal cycle enriching the aquatic habitat and replenishing soil fertility. However the increasing frequency of floods and the resulting loss of human lives and destruction to the economic and social assets required the nations of Mekong riparian countries to address the complex flood problems holistically through an integrated approach with full attention to the Transboundary and regional issues. This led the Mekong River Commission (MRC) to launch a new Flood Management and Mitigation Program (FMMP) in 2002 with five clearly identified components. Whilst the FMMP aimed to address the complex flood issues at macro level there has been an equally strong need to address the increasing vulnerabilities of the populations living in flood prone areas of LMB to higher than normal annual floods and flash floods.

USAID/OFDA supported project filled this gap by supporting to ‘reduce the vulnerability of communities in Cambodia and Lao PDR to higher than normal annual floods and flash floods.’ The Project was designed to contribute to this goal by achieving the following two objectives

Objective 1. Develop useful and understandable MRC flood warnings, which are responsive to the needs of and promptly conveyed to the most flood vulnerable communities in Cambodia and Lao PDR

Objective 2: Develop tools and methods, with the help of community based implementing partners, to enable flood vulnerable populations in Cambodia and Lao PDR to effectively respond to MRC prepared warnings.

The project has been in operation for four years having started its activities in early 2003. MRC the executive agency has entered into agreements with American Red Cross (ARC) and Action Contre la Faim (ACF) as the main implementing partners while National Committee for Disaster Management (NCDM) and Department of Hydrology and River Works (DHRW) as main Cambodian counterpart to achieve the objectives of the project. ARC in turn has signed a sub-agreement with Cambodian Red Cross (CRC) to implement project activities.

The project is subjected to an evaluation at the fifth year of its operations to find out whether the project has been able to make an impact in reducing the vulnerabilities of the people living on the flood plain of Cambodia and also whether the Early Warning Systems (EWS) delivered will be sustained within the same communities.

The evaluation team comprised of one international consultants and four representatives of project implementing partners together with an independent translator commenced the evaluation process on 5 March 2007 under a well designed Scope of Work (SOW). The methodology of the evaluation strictly followed the SOW including 14 days of strenuous and extremely tiring field visits to twenty (20) villages in all five Provinces where the project has delivered its activities with planed inputs.

The two objectives of the project are still valid and perhaps more valid tomorrow given the increasing frequency and intensity of floods and also the resulting vulnerability of the people in Cambodia. Whilst the FMMP focuses on macro level flood management and mitigations concerns, this project focuses exclusively on the end user who will not be benefited directly and immediately by macro interventions. Given the experience reported worldwide as to the exacerbated hazard risks of macro interventions particularly to vulnerable communities, the project on EWS is highly relevant to the target group it intended to reach. The implementing partners who are the key players in the disaster management and mitigation in Cambodia at national, provincial, district and commune levels including the village level too have gained by the project through enhanced and strengthened capacity.

The project planned to produce three specific outputs. These are;

1. Flood referencing tools, materials and methods
2. Early warning system guidebooks and village manuals
3. Community feedback

The MRC flood warning and location specific flood forecasts produced by DHRW based on the flood levels recorded at the target village level are the most critical and vital inputs in producing the outputs. The two way communication network established vertically and strengthened from national down to village level by Cambodian Red Cross (CRC) enabled the process of producing location specific flood forecasts. The flood markers installed at technically suitable locations of target villages taking mainstream hydrology stations as benchmarks with the involvement of the villagers are the main tool to record village flood level on daily basis and report the data to the national level. The village billboard installed at places central to the villages is the tool that provided ‘flood warning’ information in easily understandable manner to the vulnerable people by posting the MRC and DHRW produced flood forecast and warning daily during the flood season. In addition Red Cross Volunteers (RCVs) used the public address system and equipment provided under the project to inform villagers of the flood warnings, promoting them to respond to the situation.

This is a modest and simple EWS that is being delivered to the target communities effectively and efficiently despite few set backs and constraints reported. The overall performance of USAID/OFDA funded project is **highly satisfactory** as a “stand alone” project. It has produced the intended outcomes and also fulfilled the needs of vulnerable communities with another source of flood information and warning which is ‘very closer to home’. The village leaders and communities expressed their satisfaction over the new tool of EWS and demonstrated their ownership by even committing to maintain village billboards and flood makers with their own resources, both financial and labor. The role of RCVs is highly appreciated by the villages. There is a significant visibility of USAID at the village level. In the words of people this visibility is expressed as “The People of America gave us tools, but we own them”

The institutional structure mobilized through the project from national to commune level is prepared to continue the EWS as an integral component of the Commune Development Plan which will be included in the National Five Year Development Plan for resource allocation for its implementation. This process is just begun with the establishment of Project Support Committees at the village level under the Project and with instructions to the Commune Committee for Disaster Management (CCDM) by the NCDM through Provincial Committee for Disaster Management (PCDM) and District Committee for Disaster Management (DCDM).

EWS project has already contributed to the overall development objective of Flood Management and Mitigation Strategy (FMMS) of MRC by providing an essential tool to minimize the sufferings and economic losses of vulnerable communities. The Land Management component of FMMP is already using the village based flood forecasts generated by the MRC/DHRW for the designing of its activities. The EWS tools are being replicated under the Component 4 of FMMP in Pre Veng Province. It confirms that EWS as a tool and also the forecasts generated are priceless inputs to FMMP. More specifically the project has brought in very pertinent building block for all the components of Flood Management and Mitigation Program (FMMP) by harnessing the participation of vulnerable communities who are at the center of all the interventions.

Given this success story the question remains to answer is how to sustain the achievements of the Project during the transition period of completion of the project and the beginning of the activities of Commune Development Plan with EWS as its integral component with national governmental budgetary support. The answer depends on the continuation of the two major outcomes of the Project, namely the following during this bridging period;

1. Useful and understandable MRC/DHRW flood forecasts based on information flows from the flood plain
2. Flood vulnerable communities in Cambodia effectively respond to MRC/DHRW prepared flood information

These two outcomes are mutually depended and interlinked. It is therefore strongly recommended to continue the present support to the project for a period of minimum three years beyond 2007 allowing the continuity of the present momentum until the EWS is fully integrated in the Commune Disaster Management Plan which will be incorporated in the National Development Plan with financial resources allocated under the national budget. In terms of funding it is recommended to provide financial resources required to maintain the EWS for next three years as initial capital is already invested.

Contents

Acknowledgements	.....	1
List of Acronyms and Abbreviations	.....	2
Executive Summary	.....	3
Table of Contents	.....	6
Chapter 01: Purpose and Methodology	.....	8
1.1 The Purpose	.....	8
1.2 The Methodology	.....	8
Chapter 2.0: Evaluation Findings	.....	12
2.1 The Problem	.....	12
2.2 The Project	.....	13
2.3 Relevance of the Project	.....	16
2.4 Performance	.....	19
2.5 Effectiveness in achieving desired outcomes	.....	24
2.6 Efficiency	.....	26
2.7 Success	.....	29
Chapter 3.0: Sustainability	.....	31
3.1 Strengths	.....	31
3.2 Opportunities and Challenges	.....	33
Chapter 4.0: Conclusion	.....	35
Chapter 5.0: Lessons Learned	.....	36
Chapter 6.0: Recommendations	.....	37
6.1 Principal Recommendation	.....	37
6.2 Strategic Recommendation	.....	38
6.3 Supplementary Recommendations	.....	38

Tables:

Table 1 - Objectives and Activities of EWS Project
Table 2 - Project Performance Measurement Indicators
Table 3 - Billboard Information for EWS
Table 4 - Delays in Administrative Arrangements

Annexes:

Annex I : Scope of Work..... i
Annex II : Work Plan of Evaluation Mission viii
Annex III : Persons Consulted During the Evaluation Process x
Annex IV : End Line Survey..... xii
Annex V : Field Observation Report xv
Annex VI : Report of the End Line Survey – Introduction and Rationale.... xix
Annex VII : List of Indicators xxii

Chapter 01: Purpose and Methodology

1.1 The Purpose

The Final Evaluation of the Project fulfills a requirement of the Cooperative Agreement (CA) signed between the United State Agency for International Development /Office of the Foreign Disaster Assistance (USAID/OFDA) and Mekong River Commission (MRC) on 16 December 2002. The purpose of the evaluation as per the Scope of Work (SOW) is to focus on the impact of the Early Warning Systems (EWS) introduced during the implementation of the project activities and on the sustainability of these within the communities.

More specifically the Evaluation was requested to assess the status of the outputs intended to produce and the objectives envisaged to achieve with an overall assessment on to the relevance, effectiveness, efficiency and appropriateness of the Project in relation to the larger Flood Management and Mitigation Program (FMMP) that is being executed by the MRC.

The SOW of the evaluation expected that the Evaluation findings should lead to a set of recommendations as to the

1. **Replication and continuity of the project activities “in other parts of the Lower Mekong River Basin (and other basins) and also the**
2. **Continuation of EWS Process by responsible local authorities and replication of such activities in other high risk areas**

In addition, The Evaluation also made an attempt to find out any lessons and good practices that might have emerged as a result of the implementation of this Project in order to share these lessons with others in the field of development assistance and cooperation although this was not explicitly stated in the SOW.

1.2 The Methodology

In determining the Methodology of the evaluation, the Team screened closely the above stated purpose and recognized that the evaluation should serve a dual purpose. One is the evaluation of the Project as a stand alone intervention and the other is to assess the relevance, effectiveness, efficiency and appropriateness of the Project in relation to the FMMP. However it should be noted here that the above two purposes are not mutually exclusive but largely inter-related.

There were several evaluation tools which were given in the SOW. These are the following;

- Review of project data and information from the routine monitoring system
- Detailed document review
- Conduct End Line survey
- Key informant interviews with personnel, local partners including the National Committee for Disaster Management (NCDM) and other partners and organization (See Annex 3: List of persons interviewed)
- Focus group discussions that include beneficiaries, other community members, village leaders and Project Support Committees (PSC)

The Team diligently followed above tools stated in the SOW.

However the Team Leader was of the view that the End Line Survey should be more focused on the Purpose of the Evaluation. It was noted that the Draft End Line Survey Questionnaire Form given in the Appendix D of the SOW of the Project evaluation was identical to the Baseline survey questionnaire. Having reviewed very carefully the subject questionnaire and the reports of the two baseline surveys conducted in 2003 and 2004, the Team Leader was of the view that using the same questionnaire to generate data and information in the proposed End Line Survey would not be cost effective and also would not serve the purpose of evaluation. In addition there was no time to organize the same responders who provided their inputs to the Baseline survey to interview once again to assess the end line situation.

Therefore the Team Leader suggested modifying the questionnaire to be more focused on the purpose of evaluation rather than repeating the same highly extensive and time consuming data collection and processing exercise. The questionnaire thus developed for End Line survey and used during the evaluation exercise is presented in *Annex 4(a)*. The End Line survey was undertaken during the field visits of the Evaluation team randomly selecting minimum twelve houses per village and covering 20 villages of all five provinces visited. The Results of the End Line survey is given in *Annex 6*. These results are incorporated in the Evaluation Report in support of the findings of the evaluation wherever it is appropriate.

The Baseline survey conducted while the project was in progress provided useful information on the situation on which the intervention was carried out.

The extensive field visits undertaken by the Evaluation Team to all the five Provinces that the Project is being implemented were of immense importance in observing and even field verifying the information gathered during the workshop attended by the Team on 'Handing over the EWS' and other discussions, meetings and desk reviews. The Team observed carefully the sites where the flood markers and Bill Boards are installed in the villages visited, noted how villagers listening to the radio and watching TV during the day time and after work, how the village events like meetings, Karaoke, functions such as alms givings, weddings and other celebrations attract crowds. The team was proactively initiated conversations with people and with school children during the field visits even while traveling by boat to get an impression on their awareness on EWS. The Team Leader particularly made use of these visits to observe project environment which were either not captured in progress reports, results of End Line survey or during discussions. These observations are therefore presented separately in *Annex 5* for further information and especially for future reference of potential partners who may decide to assist the deserving communities of LMB.

A special attempt was made to meet the personnel in charge of similar interventions, which are being implemented at present in the LMB as well as the projects completed during last five years in the flood plains of Cambodia. The main focus of these interventions is similar i.e reduce vulnerability of communities in flood prone areas with additional measures identified as necessary to reduce the risk in addition to EWS. The only difference is the funding sources, implementing agencies and partners while the common objective of reducing the flood risk of vulnerable communities remains same. Most of these interventions are being undertaken in the same Provinces but different villages in Cambodia. The discussions with these project personnel were very helpful in determining the strategies for the continuation of the EWS and also proposing recommendations.

The Evaluation Team is originally proposed to be comprised of representatives of Project Implementing Partners, namely ARC, CRC, ACF and Red Cross Volunteers (RCVs) who

are the key persons in charge of implementing activities in the targeted locations of the Project. However due to the busy schedule of ACF, its representative was unable to involve through the entire period of the evaluation. The RCVs were not exactly members of the evaluation team but became useful resource persons to obtain first hand information on implementing project activities in their respective villages.

In addition MRC engaged the services of an independent translator who has no association with the Project. The Translator with her academic background of Economics and her knowledge on the socio economic and cultural conditions and practices in Cambodia became a valuable source of information to the Team Leader.

The entire process of evaluation was highly participatory from the very beginning to the end of the exercise. The planning of the evaluation commenced with the arrival of the International Consultant in Phnom Penh on 4 March 2007 followed by an introductory meeting held at 9.00 a.m. on 5 March 2007 with MRC Program Officer, and the representatives of Project Implementing partners namely ARC, CRC and ACF. The Team Leader developed the work plan of the evaluation mission, which was endorsed by the team members with slight modification as to the dates. (*Annex 2 Work Plan of the Evaluation Mission*).

The Field visit program was designed exclusively by the members of the Team, as they are more knowledgeable on the field situations. It was noted that a special consideration has given to cover the most remote but highly vulnerable communities of the flood plain of Cambodia. The Team had to travel by boats and ferries several times to cross the river in order to reach target villages. In addition they walked six to eight kilometers particularly in Stung Treng province and used motorcycles to interview the target groups as four-wheel vehicles cannot reach these villages. Given this highly strenuous and tiring travel the team was able only to cover two villages per day. The time consuming travel was further aggravated due to sudden and unexpected heavy rainfall started on 19 March 2007. The rain made farmers more busy and even panic as their fields were flooded with rainwater in the middle of the peak harvesting period. Yet the villagers readily cooperated to provide the feedback on the project stating the importance of the EWS individually as well as collectively to them

The Team Leader initiated the development of questionnaires, which were reviewed and endorsed by the team members using electronic mail facilities. Further fine-tuning to the questionnaire was done during the field visits following discussions among the team members as to the effectiveness of some questions. The field visits undertaken enriched the consultation and participatory exchange of views among the team members. In this sense the evaluation exercise was highly participatory as it fully involved all of the project stakeholders, particularly three of them, namely NCDM, ARC and CRC in the review process both as informants and also as observers who were interested in finding out actual achievements of the project.

The Team reviewed the Indicators stated in the original Project Proposal in order to measure the achievements of the project after five years of its implementation. However, the Team Leader was of the view that the indicators given in the original project proposal has some limitations in measuring the achievements of the Project. Therefore the Team developed a number of new indicators to demonstrate the results of the project so far following the standard practice of formulating indicators. These are given in *Annex 7*. It should be stated here that extra measures were taken not to load the text of the evaluation report with too

many statistics, but to use only meaningful indicators to support the facts found during the evaluation process.

The main thrust of the evaluation was to assess the EWS project as a “**Stand Alone**” intervention. However, additional effort was made, whenever it is appropriate, to attribute the relevance and effectiveness of EWS in the wider scope of FMMP and thereby recommend strategies as to its continuation, replication and even up scaling.

Chapter 2.0 : Evaluation Findings

2.1 The Problem

Mekong River is one of the largest rivers in the world that serves the socio economic life of six countries that it passes through until it reaches the ocean. Flooding has been part of the river's seasonal cycle. For centuries in the history the lives of the people inhabited the Mekong river plain depend on the seasonal fluctuations of Mekong River. The enriching aquatic habitat and replenishing soil fertility are the most beneficial advantages that the people in the Mekong River basin depend on since the beginning of their civilization.

However, the river caused havoc in the lives of the very same people who depend on it when it rises higher than the expected levels during normal flood seasons in every year. The destructive flood impacts are further compounded with the flash floods ravaged the flood plain every year which are difficult to predict but caused due to locally intense rainfall. The human activities in terms of development such as hydraulic structural interventions, intensive building construction, denudation of forest cover and the hap hazard use of flood plain have further increased the risk of river flooding. It is observed that flood damage for every flood event increases in parallel with ongoing economic and infrastructural development and intensified land use in the LMB.

The section II Problem Analysis of the Project Proposal describes the background of the flood situation in the LMB in general and larger FMMP and its partners in brief. In addition this document highlights clearly “**the needs**” of the project as given below;

The need to greatly strengthen the communication of flood-warning data and information to the community level with a timeliness and format that is useful

The need of the community leaders who should have straight forward tools and knowledge by way of training to draw the attention of their communities to the MRC prepared flood forecast and warning

The need to establish a dialogue between MRC and representatives of flood vulnerable communities in order to ensure that MRC satisfies the community requirements as many as feasible and also that MRC provides high quality warning products

The Evaluation exercise noted that the problem the intervention aims to address is not stated explicitly in the project proposal. However using data and information given in the Section on Background of the project proposal the Evaluation team reconstructed the baseline problem as stated below

“(Increasing) vulnerability of the populations living in flood prone areas of LMB”

The solution to this problem could be how this undesirable situation (Negative status) is turned in to a desirable (positive) situation. Thus the desirable situation could be achieved by
“Preventing, minimizing or mitigating the vulnerability of the people”

There are two sides to this solution. One is to formulate and implement physical development (structural) interventions with careful and intensive considerations on minimizing the flood risk. Other side is to prepare the populations at-risk to face the

challenges of the natural phenomenon of flood and thereby minimize and /or mitigate their vulnerability.

This two prong attack is the basis for the formulation of Flood Management and Mitigation Strategy (FMMS) and its Implementation Program (FMMSIP) by the MRC described briefly in the section below.

2.2 The Project

The realization of the need to address the complex flood problems in the Lower Mekong Basin (LMB) holistically through an integrated approach with full attention to trans-boundary and regional issues led MRC to formulate a Flood Management and FMMS and FMMSIP. This is the framework within which a new Flood Management and Mitigation Program (FMMP) of MRC developed with five (5) clearly identified components. The MRC Council adopted these five components in November 2002 following an extensive and highly participatory consultative process.

The five components of FMMP are the following;

1. Establishment of a Regional Flood Management and Mitigation Centre
2. Structural Measures and Flood Proofing
3. Mediation of Transboundary Flood Issues
4. Flood Emergency Management Strengthening
5. Land Management

The Project funded by USAID/OFDA on the Provision of Early Warning Systems to Flood Vulnerable Communities in the LMB falls within and is consistent with the list of outputs of Component 1 of FMMP, specifically with the following two Outputs;

- Output 4-Improved operational forecasting
- Output 5-Improved warning and dissemination services

The Goal

The goal of the project is;

“To reduce the vulnerability of communities in Cambodia and Lao PDR to higher than normal annual floods and flash floods”

This goal will be one of the factors that will certainly contribute in achieving the larger goal of FMMP which is given below;

“People’s suffering and economic losses due to floods are prevented, minimized or mitigated while preserving the environmental benefits of floods” (Ref. MRC Flood Management and Mitigation Program November 2004)

The goal of preventing, minimizing or mitigating sufferings and economic losses of people can be achieved in many different means. MRC plans to achieve this goal through above stated five components.

Thus the goal of USAID/OFDA funded project not only is consistent with but also is contributing to achieve the development objective of the larger FMMP within which this project was formulated. The Project therefore provides a highly appropriate and relevant building block to construct the larger structure of FMMP.

The above goal is expected to be achieved through the following two objectives;

Objective 1. Develop useful and understandable MRC flood warnings, which are responsive to the needs of and promptly conveyed to the most flood vulnerable communities in Cambodia and Lao PDR

Objective 2: Develop tools and methods, with the help of community based implementing partners, to enable flood vulnerable populations in Cambodia and Lao PDR to effectively respond to MRC prepared warnings.

The Project has lined up number of activities to be implemented over a period of five years with a total funding of U.S.\$ 1,250,000 from USAID/OFDA to achieve the above objectives. These activities are presented below as they were given in the proposal

Table 1- Objectives and Activities of EWS Project

Objective	Activities
1	Communication technologies will be identified to convey MRC flood forecasts and warnings from the MRC to the community level (Identify communication technologies to convey MRC flood forecasts and warning to the community level)
	Analysis will be undertaken to facilitate MRC flood forecasts and warning becoming more geographic specific and timely, using Geographic Information Systems and other analytical and communication technologies (Facilitate producing more geographic and timely flood forecasts by MRC using GIS and other analytical and communication technologies)
	Partners will assist MRC gain feedback from communities on the efficacy of forecasts and warnings and means of their improvement (Assist MRC obtains feedback from communities on the efficacy of forecasts and warning and means of their improvement)
2	The most vulnerable populations in Cambodia and Lao PDR will be identified according to their historical vulnerability to annual and flash floods (Identify most vulnerable populations in Cambodia and Lao PDR according to their historical vulnerability to annual and flash floods)
	Tools and methods will be developed to facilitate community based flood referencing based on their historical vulnerabilities (Develop tools and methods to facilitate community based flood referencing based on their historical vulnerabilities)
	Tools and methods will be documented in graphic rich guidebooks in each of the riparian languages(and other ethnic dialects if warranted) to enable MRC and partners to transfer lessons learned to additional communities (Document tools and methods in graphic rich guidebooks in each of riparian languages enabling MRC partners to transfer lesson learned to additional communities)

A close look at the above activities shows that the activities of the original project proposal were presented in passive sense. The standard practice is to present activities as verbs. The activities are re-framed in the accepted standard form for the benefit of the evaluation exercise. These reframed activities are presented in the parentheses.

It is noted that the objectives of the Project were highly ambitious while the activities through which these objectives are entailed to achieve are relatively modest. For instance development of useful and understandable MRC flood forecasts and warnings was planned to be achieved with only three activities. These are the following;

- Identify communication technologies to convey the information to the communities
- Facilitate producing more geographic and timely flood forecasts by MRC using Geographic Information Systems (GIS) and other analytical and communication technologies
- Assist MRC obtains feedback from communities on the efficacy of forecasts and warning and means of their improvement

It appears that the Project proposal was designed to initiate a process of providing hitherto non-existent facility to most vulnerable communities in the LMB rather than producing a very sophisticated and technically complex scientific model. The intentions of the project should be laudable as it certainly reflects the underlying spirit of serving a deserving community who are at risk despite the presence of technically sound forecasts at macro level for nearly a half a century. The project activities therefore have been formulated as simple, easy to implement and also to serve the people who suffer in every flood event

Indicators stated in the Project Proposal need special attention in the context of evaluation. These are therefore presented below as they appear in the original project proposal;

Table 2- Project Performance Measurement Indicators

Objective	Indicators
1	1.Number of flood vulnerable communities receiving useful and understandable MRC flood forecasts and warnings
	2.Number of flood vulnerable communities receiving geographically specific and timely flood warning
	3.Institutionalization of a community based assessment mechanism which provides continuous feedback reflected in subsequent MRC flood forecasts and warnings
2	4.A classification scheme will come into practical use in assessing community vulnerability to annual and flash floods
	5.A suite of tools and methods become available with the suite reflecting the circumstances of flood vulnerable communities across the full range of flood threats in the basin
	6.Number of flood vulnerable communities receiving useful flood referencing and flood preparedness documents

It is observed that the above indicators have certain limitations. The first and the second indicators are similar in its context. The Indicator No.3 is neither quantifiable nor qualitatively presented as an indicator. It seems there are two indicators within this one indicator. i.e One could be a Community based assessment mechanism and the other could be changed flood forecasts and warnings of MRC which could be given in qualitative terms. The Indicators Nos. 4 and 5 are unclear. The number of communities receiving flood referencing and flood preparedness documents may indicate the efficiency of the activity undertaken. However, these indicators are used in the evaluation wherever appropriate to measure the achievements of the project. In addition the Evaluation team formulated additional list of indicators as presented in *Annex 7*.

The project was originally designed to cover flood prone provinces of Cambodia and Lao PDR. However the project has finally confined to cover the selected 40 villages in five flood prone provinces in Cambodia. The Evaluation therefore will assess the project that is being implemented since 2003 in Cambodia.

The MRC, the executing agency has entered in to annual agreements with ARC to implement the project activities. The CRC has been the sub-grantee of ARC for the operation of project activities and also one of the national counterparts to the project. In 2004 ACF has joined as an implementing agency to implement EWS in only two villages in Kampong Cham Province. The NCDM and DHRW are the key national counterparts of the project.

The following had been the criterion in selecting the target villages in the flood plain of Cambodia to provide Early Warning Systems (EWS);

- Most affected villages by floods
- Villages located closer to MRC gauging stations
- Presence of CRC volunteer

Having started with six villages in Kandal and Prey Veng Provinces in 2003, the project has expanded to cover 32 more villages selected through the same criteria including additional two provinces namely Kratie and Stung Treng. ARC/CRC is the implementing agency for these 38 villages. In addition two more villages in Kampong Cham Province were included in 2004 in partnership with ACF.

2.3 Relevance of the Project

The two objectives of the Project are still highly valid as discussed in the Evaluation Report in detail. Perhaps the project will be more valid tomorrow, given the increasing flood risks experienced in the five Provinces of Cambodia where the Project is being implemented. Whilst the FMMP focuses on the larger or the macro picture of flood management and mitigation, this Project focuses on the people at the receiving end who may not be reached directly with macro level interventions, given the gap between macro level benefits and the benefits percolating to the grass root level. In fact there is evidence in the development literature in the world to prove that the development interventions exacerbated the hazard risks particularly of the communities living in disaster prone situations. The realization of this fundamental truth draws the attention of and urged development practioners to approach the issue from several fronts particularly through non-structural measures that resulted in developing concepts such as Community Based Disaster Risk Management (CBDRM), Mainstreaming Disaster Risk Management in Development (MDRD) and Urban Disaster Risk Management (UDRM).

The issue of increasing frequency and intensity of floods and particularly flash floods in LMB and resulting destructive impacts will continue in the face of global warming. Although the people in LMB are not major and direct contributors to the global warming and resulting climate change, they are certainly be the victims of this serious global phenomena. The Team observed large-scale forest clearing and burning during its visits to villages especially in remote villages of Stung Treng Provinces. Since this is the season to prepare land for highland crops such as maize, cassava and other crops many farmers in Veal Ksach and Kaing Cham were busy in preparing land by clearing high canopy trees and burning the forest. This scale of forest burning too contributes to global warming. In that sense the flood vulnerable communities could be contributors to their own vulnerability and thereby getting themselves trapped in a **‘vicious cycle of vulnerability’**.

The impact of climate change could be visible in Cambodia at present. The rain started around 19 March 2007 is an unexpected event. The farmers had just planted maize and about to collect the rice harvest in the villages of Kandhal and Pre Veng at the time of the visit by the Team. However, the fields are under water with torrential rain in these locations of the flood plain destroying the young plants of maize and mature rice fields. There was no warning either from scientific and meteorological sources or traditional beliefs. The farmers face a severe threat of losing their crops due to this unforeseen event. This may be of concern to MRC particularly in the context of ‘Global Warming’ as flood water level of the mainstream of Mekong alone will not be sufficient to address the development issues of Mekong riparian states as meteorological aspects are becoming more serious.

The village level flood forecasts are already in great demand as the data generated through EWS is priceless for the formulation of activities of Component 5- Land Management of FMMP. It is learnt that the data of EWS project provides highly pertinent inputs to this Component of FMMP.

The flood plain of the Cambodian section of Mekong is home to nearly 84% of the total population of the country. Agriculture will continue to be their main source of livelihood. Added to this is the high rate of growth of population in flood vulnerable communities which stands at 2.4% at present. With the increasing demand for basic needs of food, shelter, primary health care, and access to education, portable water and proper sanitation make these communities highly vulnerable to the normal annual floods. The increasing frequency of higher than normal floods and flash floods increases the severity of their vulnerability. The people have no other place to live other than around the banks and flood plain of Mekong given the topography of the country. Therefore these people have no option but get themselves prepared to face the risk that they are destined to face.

These are the targeted communities that the Project anticipated to serve and to strengthen their capacity to manage risks of higher than annual average floods and flash floods. Although the project alone is not a sufficient condition, it will certainly contribute to reduce the vulnerability of the communities to a great extent by making them aware of the flood risk and preparing them in advance to adequate responsive measures for impending disasters.

The Direct beneficiaries of the Project are not explicitly stated in the Project Proposal. However it is certain that the direct beneficiaries are the targeted population at-risk living in flood vulnerable spatial areas of LMB. As reflected in detail in the section on “Project Performance” the flood vulnerable communities have received a new and reliable source for them to refer in facing floods. Although the villages did not face a serious flood situation

after the installation of EWS to test the effectiveness of the new system, they expressed their increasing reliance on this new and **“more closer to home”** source of warning, which is clear and more accurate.

In addition, the ‘Service Providers’ also had been benefited as a result of the Project. This group includes, MRC, DHRW and its partners who are responsible for implementing the project. The MRC and DHRW had benefited by receiving continuous flow of data from the flood markers installed in the flood prone villages in the five Provinces which certainly the first time experience in their forecasting efforts. According to the representative of DHRW the spatially specific forecasting outside the normal “Mainstream” forecast is a new experience to the Department. Although MRC has been involved in flood forecasting in the Mekong Region since 1960s, it is reported that this is a good opportunity for MRC too to concentrate spatially specific flood forecasting at micro level with the implementation of the project. The usefulness of the Project goes beyond its objectives. For example, the information recorded in the village flood marker is of good value to Component 5 of FMMP on Land Management. As a result there is a strong demand to expand the EWS network for generating village flood data and also this information becoming part of the MRC regular data collection process.

The collection of spatially specific flood data is feasible due to the extensive network of CRC officials and Red Cross Volunteers (RCVs) based at the village level sending the daily readings of the flood markers installed in their villages during the flood seasons. Prior to the project and even now there is no governmental agency that is entrusted with the responsibility of observing flood levels at village level. The formal flood forecasts were limited to mainstream of Mekong based on the data from mainstream hydrological stations of DHRW. DHRW has no way of undertaking spatially specific flood forecasting given the topography, transport and communication difficulties of the villages in the flood prone provinces of Cambodia in addition to the limited institutional structure and arrangements of DHRW. It is unlikely to expect a full-scale decentralization of DHRW to the village level for couple of decades. The absence of a village-based institution to link the village with the center has successfully overcome by the CRC by recruiting RCVs and training them to serve as this link.

The capacity of implementing partners too had been strengthened as a result of the project to deliver their mandate more effectively through the partnerships they build during the project implementation with communities and other counterparts at the National, Provincial and District levels. The equipment provided under the Project seems to have strengthened the two-way communication of information on flood level data and flood forecasts from the village to the center and back to the village. There has been a close cooperation among these different groups at all levels during the implementation of the Project. The discussions held with the representatives of NCDM, PCDMs and CCDMs confirmed the system, strong cooperation and close coordination that are in place to implement the Project activities even after the present phase. This further confirms the degree to which the project is relevant and valid to the situation that the project aims to change.

The CRC is a constitutionally established national civil society organization in Cambodia with strong support of the government. The network of volunteers serving at all levels and geographical areas of the country are exposed to number of training and awareness programs particularly on Disaster Management. Community Based Flood Mitigation and Preparedness Project (CBFMP) implemented by the Asian Disaster Preparedness Center (ADPC) during the period of 1998 to 2001 developed an organizational framework for flood vulnerability

reduction in 23 Cambodian villages is one such program. Total of 159 RCVs of CRC were trained in disaster management and Hazard mapping in addition to the standard training on Red Cross Values and Responsibilities, Leadership and Community Organizing and Financial Management under this project while establishing village level Disaster Management Committees (DMCs). The training on EWS provided to RCVs provided additional skills to the existing capacity of CRC at the village level.

2.4 Performance

There are three specific outputs that the Project intended to produce as per the project annual work plans. These are the following;

Output 1.1 Flood referencing tools, materials and methods

Output 1.2 Early Warning System Guidebooks and Village Manuals

Output 1.3 Community feedback

Useful and understandable MRC flood warnings and the flood markers and billboards are the components of Output 1. Whilst the flood markers indicate the flood level at the location on daily basis the billboard gives the flood forecasts for two days produced by the MRC and DHRW for the same location and corresponding flood level at the benchmark of the mainstream. These are installed in locations largely identified by the people with negligible exceptions to the contrary. The flood markers had been located using Geographic Positioning Systems (GPS) and the elevations based on benchmarks of the nearest hydrological station of the mainstream of Mekong.

A team comprised of technical experts of both MRC and DHRW having consulted RCVs and villagers in determining the correct spot at each location had installed 142 flood markers. The Evaluation Team observed that the flood markers are solidly fixed on the ground with clearly visible marking in black on a white metal plate that is fixed to a strong steel post. There were few flood markers which are getting corroded and the marking on the metal plate becoming invisible.

The purpose of installing flood markers at specific locations of the flood plain is to provide location specific forecasts in addition to the mainstream forecasts expecting that information will be an adequate and useful tool to give responsible warning to the vulnerable people. The flood marker readings relayed to DHRW are utilized to forecast the next two day water levels and provide back the location specific forecasts to each village where flood markers are installed. *Attachment 1* provides a sample of Flood Forecast Bulletin formally issued by DHRW in the selected days of the flood peak season of 2006. The two day forecasts provided by DHRW are posted to the village billboard by the RCVs and thereby updating the billboard daily during the food season.

The target communities had been involved in identifying the locations of flood markers and also been informed of the purpose of these markers. In addition 40 Billboards and Alarm Boards had been established in central places of all 40 villages to provide correct and timely information on the flood situation enabling vulnerable people to respond accordingly. The billboard gives the flood forecast for two consecutive days. A sample Billboard is shown in the Figure 1.

Figure : 1 – Sample Billboard






The billboard is designed to provide the information given in the following Table.

Table 3- Billboard Information for EWS

Village Name
 Population
 Total Land Area

Alarm Stage

Green 
 Yellow 
 Red 

Day	Date	Village Water Level (Meters)	Mainstream Water Level (Meters)	Flooded Area Ha.
Yesterday				
Today				
Tomorrow				
After tomorrow				

There has not been a major flood after the installation of these flood markers and billboards. The real need to look for the information on the billboard as to the forecast therefore has not arisen yet.

However the End Line survey conducted reveals that 68% of the villagers depend on the flood markers and billboards to assess the direction of floods in addition to listening to the radio and watching in the Television in villages such facilities are available. The survey further revealed that the percentage of people looks at the Bill Board during floods is higher (59%) than those who look at them before floods (37%). This number drastically reduced after floods to 23% as there is no need for that information once the flood recedes.

In addition to the updating of the billboard with latest flood forecasts, and sending readings of flood markers to CRC, the RCVs has informed the people visiting house to house and also using the loud speakers on the flood situation during the floods of last year. In Kandal province the RCV in Tacho village has used his own boat fixed with the public address system to inform the villages of the flood levels. Being the leaders of the village the RCV understand well the behavior of his own fellow villages and therefore takes extra measures to convince them of the risks of floods. This commitment on the part of the RCVs is the strength of the CRC network.

However, during 2006 the people were taken by surprise when the paddy fields were suddenly flooded in November. Once the normal flood receded farmers prepared their paddy fields and sowed seeds and replanted paddy. There were no forecasts either on the billboards or by radio or any other source as it was completely outside the normal flood season. Infant paddy plants washed away forcing farmers to re-cultivate their paddy fields. The farmers in their normal spirit saying that they lost only few kilograms of seed paddy and not the entire harvest accepted this loss. This statement indicates the need for timely warning when it comes to their harvest, the result of their entire effort and livelihood as they are contended with any thing less than that.

The Evaluation Team observed two distinct models of implementing the activities of the Project. This difference is due to the difference of planning and implementing procedures of the two partner agencies, namely American Red Cross (ARC) with its sub-grantee Cambodian Red Cross (CRC) and Action Contra la Faim (ACF). The performance of the project too varies according to the two implementing arrangements.

ACF has applied Results Based Approach for planning the implementation of the project activities. Thus ACF focused on achieving four (4) results.

Result 1- The institutions at Provincial level (PCDM) has increased its operational capacity in disaster preparedness and mitigation

Result 2- The communal level (one Commune) has developed a Commune Disaster Management Plan including risk reduction measures and flood early warning system

Result 3- The Community level (2 villages) is fully interactive with Commune Disaster Management Plan

Result 4- The Civil Society (Cambodia Red Cross) contributes to the planning and implementation of Disaster Management Policy from the Provincial down to the community level

The activities lined up to achieve these results are logically designed with clear sequential order. (See Annex 5 ACF Report in Annual Report 2005 –page 42-56)

ACF has confined to “One way communication” under the EWS in two villages in Kampong Cham province. This means that the flood marker readings are reported to the center but takes no responsibility of disseminating the forecasting to the people in the same manner that

is done under the ARC/CRC implemented component of the project. Instead ACF used the local radio broadcasting facility in disseminating flood forecast. However the forecasts are being displayed on the billboard by the RCVs who are serving in these villages.

The ARC/CRC led project implementation has been largely concentrated on its institutional network. The activities lined up in the Annual Work Plans of ARC/CRC centered on delivering flood forecasts developed by MRC and DHRW to communities and relaying the readings from the village flood markers to MRC/DHRW. In addition providing training and awareness on EWS to many partners down this channel had been a major activity. The need to build the capacity of CRC officials particularly the RCVs is justifiable given the importance of their role in the communication of information, which is very critical and vital to the operation of the project.

ARC/CRC has opted to a two-pronged strategy to address the institutionalization of EWS. At the national level ARC/CRC has been able to mobilize the formal governmental support by linking with NCDM in 2005. One senior officer of NCDM has been assigned to facilitate providing flood warning information to PCDMs, DCDMs and CCDMs. This arrangement has facilitated to solicit the cooperation of PCDMs and CCDMs in the targeted provinces.

At the village level ARC/CRC has established Project Support Committees (PSC) in 2006 in all 38 villages where ARC/CRC implements the Project. The need for a special body was recognized around 2005 given the labor-intensive functions that each RCV has to perform in order to deliver properly the EWS in its full context. Therefore PSC had been established in 2006, comprising of 2 members of CCDM, 2 RCVs, village chief and 1 key person of the village. The functions expected from this committee are;

- Assist RCV to disseminate information to villages
- Mobilize community participation
- Increase involvement of governmental and Non-Governmental Organizations (NGOs) working in the area in the project activities.

The rationale of establishing the PSC could be justified given these functions. More importantly the making people understand EWS particularly the risks and response measures in the given situations of these villages need time and effort. This is about changing human behavior that has been there for generations. As the members of PSCs are drawn from the members of the CCDM another advantage of establishing PSC could be the opportunity available for lesser number of members to focus exclusively on EWS at the village level compared with the larger issues of disaster management addressed by the CCDM covering number of villages in the Commune. The previous experience of CRC under ADPC implemented CBFMP project where village level Disaster Management Committees (DMCs) were established may have influenced in setting up PSCs under EWS. This arrangement seems to have demonstrated its validity and relevance as discussed below.

Instead of creating a new institution, ACF has utilized the existing institutional structure namely CCDM, which has the mandate formally to address the disaster concerns at the Commune, level that covers number of villages. Commune is the lowest level of the Government structure. The Commune Council is the Local Authority elected through people's vote. The CCDM headed by the elected chairperson of the Commune Council. Other members of the CCDM include relevant officials at the Commune level plus village leaders. The CCDM is vertically linked up with DCDM and PCDM. The PCDM is directly linked with the NCDM.

This hierarchical order within the government administrative structure is permanent compared with any ad hoc institution that may establish to serve only the purpose of an externally funded project during its implementation. The approach of ACF to implement the project through the existing institutional arrangement therefore is rationale and bound to sustain whereas ad hoc arrangements have a higher probability to disappear with the tapering off of the external support.

However the Evaluation Team observed a strong willingness on the part of the PSC to continue the EWS while the beneficiaries expressing their confidence and support to the PSC. To this extent the Team is of the view that the PSC should be allowed to continue with its present mandate perhaps with a changed title as the main focus is EWS and not the Project. However the CCDM with its formal approval of the government to be responsible for disaster management concerns on the one hand and being a committee formally established within the existing Local Government structure on the other and, it is reported that there is a strong support by the Local Authorities in terms of cooperation, participation and contribution.

ACF has focused on achieving four specific results to strengthen the capacity of exiting institutions through training. ACF has provided training to PCDM working group comprised of two officials from each department of the government that serve in PCDM i.e Education, Health, Environment etc. The Governor has assigned these officials to be trained in Disaster Management. The main resource persons had been drawn from NCDM, CRC, PRC and ACF.

It is noted that ACF has promoted the participation and involvement of stakeholders strategically ensuring the sustainability of their initiatives. For instance the designing, writing and recording of the Radio spot that is being broadcasted through the radio of Kampong Cham was done with strong involvement of the Department of Information in Kampong Cham and Department of Culture and Art. The Deputy Director of the Department of Information expressed his strong support to continue this radio program as public response to the program is highly positive and satisfactory.

Another noteworthy and strategic result of the ACF responsible component of the project is the focus on “The Civil Society (Cambodia Red Cross) contributes to the planning and implementation of Disaster Management Policy from the Provincial down to the community level”. There is a great need to support the decentralized structure of the government in general and in terms of disaster management in particular. As the disasters are largely spatial specific occurrences, the management of such localized events could be tackled more effectively if such efforts are decentralized and closer to the event or on scene as far as possible. From the perspective of this project the institutional structure of the Province and below is critical to ensure the sustainability of its outcome.

ARC/CRC has invested largely in building the capacity of their officials. The training modules designed are focused on the needs and expected response at different levels. The delivery of these training modules to a large number of beneficiaries, including 76 RCVs had taken place during the last four-year period of the project. Thus there seems a ready pool of human resources for future operations at all levels particularly at the village level.

The contribution made by the RCVs is very significant in achieving the outcomes of the project. They have taken keen interest to educate their fellow villagers to understand the new form of information available to them in order to protect themselves and their economic

assets from flood risks. The RCVs who are serving in the 40 villages are largely the educated and respected youth, both male and female, in the village. There are 22 female RCVs at present among the total of 76 RCVs serving in the EWS project. They demonstrated high degree of commitment to the activities they perform under the project. RCVs had trained village youth to read flood markers and transfer the information to village billboards. This indicates the interests of village youth in participating in the activities of the village on the one hand and also the possibility of transferring the responsibility to them enabling the activity to continue that will ensure its sustainability.

It was reported that the RCVs are compelled to repeat the information on EWS in order to make the people in the community understand it properly and respond accordingly. The villagers are particularly concerned to know whether the flood level is going up and alarm situation is near so that they will be able to take next steps. They do not necessarily make an extra effort to read the billboard which is located at a central place of the village, may be somewhat far away from the person's own house. This nature of behavior is justifiable given the subsistence level of their living. The time is precious for them to attend to their livelihoods exclusively based on agricultural activities including looking after the livestock. It was observed that every member of the family, including children around six to seven years contribute their labor for the subsistence living. Little children taking animals for grazing, herding them back from fields, attending to crops, looking after the siblings when the parents are away from home are very common features in all the villages visited. RCVs themselves being one of the villagers whose livelihoods are also equally at subsistence level reported the enormous and highly labor-intensive effort they have to make in order to bring the required understanding on the EWS in the minds of the villagers. In other words bringing villagers on board to understand EWS needs several visits to one person and involving him in a long conversation before explaining the tools of EWS. In a way this is a normal practice in Cambodian culture where preparing the background is more important than directly plunging to the subject matter.

Both ARC/CRC and ACF had reported the progress of the respective activities in detail as reflected in number of Quarterly reports reviewed. This report therefore does not repeat the progress of the project activities as that has been adequately covered in the progress reports. However the evaluation particularly focused on the effectiveness of the project in producing its desired outcomes and also the efficiency with which the inputs were transformed into outputs.

2.5 Effectiveness in achieving desired outcomes

The evaluation team is of the view that the project was able to produce its desired outcomes to a great extent although it is too early and also not easy to present the outcome in quantitative terms. The following results of the End Line survey attempt to summarize the evidence statistically as to the successful accomplishment of one of the desired outcome, namely 'useful and easily understandable MRC flood warning'

90% in the targeted villagers knew EWS in their respective villages

A larger number, nearly 59 % of the villagers are keen to look at the Billboard during floods. This number reduces drastically after the flood situation is over.

The number of people who look for the "Alarm Color" of the billboard is significant i.e 41%

Many are keen to see the 'Today's water level' (44%) than 'Yesterday's Water Level' (34%)

A larger percentage of people i.e 76% do not want to rely on traditional means for flood warning. This indicates the changing perceptions as a result of more reliable warning closer to home.

Nearly 68.% people expressed that they would continue to look at the bill board for flood warning although there are other means of flood warning available to these vulnerable communities. Particularly the people in the distant villages of Stung Treng who have no other sources of information expressed their confidence and therefore the need for the Billboard information. Given their location far away from the city center and the topography of land which divides into many isolated parts during the flood season due to Mekong river water flowing inland through streams and creeks during flooding in addition to rain water collected in the area, the people in these villages have no way of receiving flood warning.

The other outcome envisaged to produce is the "development of tools and methods enabling vulnerable people to respond effectively to the MRC prepared flood forecasts".

It is too early to assess the effectiveness of this outcome at this stage of the project as the project is still being implemented. On the other hand there has not been an opportunity for the people to respond as there was no major floods since 2003 in which year the project started.

The project implementing partners have developed number of tools in addition to the Billboards such as leaflets, posters, village guidebooks, village maps and even had borrowed a video from OXFAM/GB on "Living with Floods" in order to make people aware of the need and importance of EWS in responding to higher than normal floods. The video developed by ARC/CRC also was shown in the villages using village Karaoke shops, village shops and houses that have televisions. Six TV channels have shown community based flood risk mitigation activities of ACF in Kampong Cham province. These separately developed but targeting a similar audience who face same threats and risks have been consolidated and disseminated effectively demonstrating the degree of cooperation among partner agencies that would generate multiple benefits.

There had been meetings almost in every month in the villages using common facilities such as pagodas and schools to create awareness on EWS. The use of village Karaoke facility and the display of borrowed video of OXFAM/GB as reported in the progress reports of the ARC/CRC demonstrated the commitment on the part of the partners to ensure timely implementation of the project activities. The delay in developing Information, Education and Communication (IEC) material seemed to have compromised with this type of initiatives for promoting awareness. Despite the delays the awareness programs carried out with borrowed material has made an impact as reflected in The Community Feedback survey conducted by ARC/CRC in October 2005. This has revealed the effectiveness of the project as far as the understanding of the vulnerable people is concerned. The End Line survey too confirmed the same result as given succinctly below;

57% of people understand the information on the Billboard

The people believe that EWS will help them in protecting their animals (45.%) their children (62%), their crops (32.%) and their houses (25.%)

68.% of people are willing to contribute money and their labor to maintain the flood markers, implying the strong need of the facility given its importance and benefits to them individually as well as collectively.

This level of commitment and ownership demonstrated by the target group is a positive achievement of the project. According to the Baseline survey nearly 66% saw the flood warning in the television while 59% heard over the radio. This is in a situation where 73% of the respondents own either a radio or TV or both. However the project has extended its coverage to very rural area where such modern communication means are yet to arrive while the villages are scattered over a vast extent of land that are divided topographically into small islands during floods with the overflowing sub-streams and tributaries of Mekong river. These are the nine villages in Stung Treng Province. Only one person out of 49 interviewed owns a television, which again does not receive normal transmission signals therefore used for watching videos. The End Line survey covered this Province and found that 57 % understands flood forecasts and the warning. The feedback of this Province is very positive compared with other provinces.

The evaluation exercise did not attempt to assess the cost effectiveness of the project as there has been a separate audit to ascertain the effectiveness in financial terms. The positive outcomes stated above are based on the responses of the people who expressed their views to a structured questionnaire. The real time test is not yet observed as there was no significant flood after project commenced its activities in 2003. In fact it was reported that the floods occurred during last four years were less than normal.

On the other hand the positive outcomes that are observed outside the project too could be considered as spread effects, which should be taken into account when assessing the returns to the original investment. The use of EWS as a tool and the village specific flood data by Components 4 and 5 of FMMP proves that the outcome of the project has already contributed to the achievement of the larger goal of FMMP. This argument is further elaborated in the section on Success.

In view of these discussions, it could be concluded that the project performance during the period of its implementation is **highly satisfactory** and effective particularly in the face of number of significant constraints faced in each stage of project implementation, which are discussed in this report.

2.6 Efficiency

Despite the positive outcomes achieved so far, the Evaluation observations are skeptical about the efficiency with which the inputs of the projects were transformed into outputs. There are number of reasons for this skepticism which are discussed below.

The key reason for this skepticism is the delays reported repeatedly in commencing activities due to delays in completing administrative arrangements on time. As per Annual Report 2005, these delays were mainly due to the time taken to review and sign the Grant Agreement. (Ref. page 8, Annual Report 2005). It is reported that ARC Head Quarters has taken nearly eight (8) months to review Grant Agreement of 2005. Similar delays had been the case in point in signing the agreements between MRC and the implementing partner ARC having signed the grant agreement between USAID/OFDA the donor and MRC, the executing agency on 13 December 2002. These delays are presented below for easy comprehension.

Table 4 - Delays in Administrative Arrangements

Sub-agreement No	Period	Signed on	Remarks
MRC 573/2003	1/01 to 31/12/2003	12/08/2003	8 months delay
MRC 600/2004	1/01 to 31/12/2004	13/02/2004	Only 2 months, yet a delay
MRC 67/2005	1/01 to 31/12/2005	3/10/2005	10 months, a serious delay
MRC/690/2006	1/01 to 31/12/2006	No date	Serious laps

Source: Annual Reports of respective years

The first Agreement between MRC and ARC for the year 2003 has signed on the eighth month of the year leaving only four months to carry out the planned activities as per the Annual Work Plan. The delay of completing second agreement seems negligible, as it has taken only one and half months of 2004. However that delay also should have been avoided given it was the second year of project implementation. The ten months taken to complete this simple but very pertinent administrative procedure in 2005 is totally unacceptable and far from any justification as 2005 could have been the peak year of the implementation of this five-year project. The next agreement signed for 2006 has no date but only signatures implying serious concerns as to the responsiveness of the partners.

Number of activities planned as per annual work plans had been re-scheduled due these administrative delays according to the Quarterly reports of ARC/CRC. The impact of these delays on liquidity situation has been minimized by reshuffling funds available with ARC/CRC.

Similar administrative difficulties are reported within the CRC such as opening bank accounts for CRC Branch offices. Particularly the vacancy of the branch office that delayed opening bank account for Kandal province until 2005 is a serious lapse as this province is very closer to the capital city and the Head Quarters of CRC. These were sorted out in 2006, which is almost the last year of the project. CRC should have these arrangements in place before or minimum at the time of starting the Project knowing very well the need for efficient management of funds and accountability. Given the past track record of CRC having implemented similar projects even in the provinces that EWS is being implemented , the time spent in settling minor administrative matters could have been either avoided or minimized.

The reason for highlighting these weaknesses is to draw the attention of project partners on the need and importance to clear administrative matters no sooner the agreement is signed with the donor agency. In fact best arrangement would have been signing a five year agreement at the outset rather than signing annual agreements in each consecutive year as this is a Five-Year project. The only clearance required should have been limited to the annual budget on a basis of the cash flow. A suitable condition for this should have been included in the original agreement. This could have eased the uncertainty implicated on project beneficiaries. More importantly such long term agreement could have facilitated smooth operations of project activities.

The arrangement in place for monitoring the project has been through a monthly meeting at the MRC with all partners and quarterly reporting on the progress. These meetings had been instrumental in clearing the constraints and steering the project through its trajectory. The proceedings of these monthly meetings are well recorded. That provided useful information for the evaluation. It was found that the manner these meetings were conducted, proceedings were recorded and the follow up actions taken on the decisions arrived at the meetings were very useful in monitoring the implementation of the project activities. The Project Manager and his staff should be commended for their close monitoring of the project activities. The high turn over of Project Managers who were responsible for the EWS project has had limited negative impact according to the observations of the Evaluation Team. However the practice of monthly meetings has been replaced with quarterly meetings starting from 2006 according to the Second Quarterly Report of 2006. No serious negative impact was noted on monitoring activities due to this change.

The Monitoring and Evaluation Feedback form and the daily and weekly feedback form developed jointly by MRC/ARC/CRC have been effective instruments in monitoring the project activities.

The team is of the view the project was well monitored with proper records which makes an evaluation easy and more productive.

The evaluation found number of issues related to the quality of inputs provided under the project. However this excludes the most vital input for the successful achievement of the project objective 1 : the **“Useful and understandable flood forecasts”**. The Evaluation Team did not attempt to assess the technical quality of the flood forecasts provided to villages given the fact there was no such technical competency within the team. On the other hand it is accepted as technically sound and serves the expectations of the project as useful and understandable warnings given the fact that these are developed in greater cooperation and harmony between MRC and DHRW, the two technical agencies responsible for this input. The field observations confirmed that the MRC produced village specific flood forecasts were made available to the people during each consecutive flood season after 2005. This information has immediately been conveyed to the villagers through the chain of communication system established until it finally appears in the village level billboard enabling villagers to benefit from this information. The officer in charge of Research and Flood Forecasting of DHRW confirmed that the flood marker readings are being used as a parameter in the flood plain water level forecasting. It was reported that there is no direct involvement of MRC to produce these village specific flood forecasts. MRC too is a recipient of DHRW produced flood forecasts for further dissemination. This confirms that as far as the village specific flood forecasts are concerned, DHRW is in full control over its product demonstrating the technical capability and authority of the organization.

The most critical input of the project has been the series of training programs undertaken at different levels to make the flood warnings ‘understandable’ to the people. In order to deliver this input the CRC has trained the RCVs who engaged in the project activities at the village level during “None flood season”. The subjects of the training include key themes such as Flood early warning and dissemination, flood response and preparedness. The End Line survey confirmed that relatively a larger number of people i.e 58%, understand the information on the billboard. Given this situation and the level of understanding revealed in the End Line survey, it may be correct to assume that the training inputs have been reasonably of good quality.

The quality of the 38 speaker systems provided in 2005 draws a serious concern as some were out of order and got deteriorated by 2006. Some of the speakers provided could only be used for a short period. ICOM battery did not last enough to communicate water level to and from CRC branches. Car battery for charging the ICOM has failed in certain instances. The village Flood Marker in Peam Ta Ek village in Lovea Em District got rusted and broken. The Evaluation team also observed some deteriorated flood markers. These deficiencies indicate that the quality of some inputs was inferior or sub-standard.

It is also reported that some of the essential equipment were provided very late in the project period e.g bicycles were given in 1 quarter of 2006. These are essential for the delivery of the services of RCVs. The work plan of 2004 has planned to procure equipment for RCVs. However the actual delivery had been delayed till late 2005.

Despite the minor deficiencies reported and observed during the field visits of the Evaluation Team, the overall performance of the project is satisfactory. Using the standard rating adopted in evaluating projects, i.e satisfactory, highly satisfactory, average, unsatisfactory and highly unsatisfactory, the Evaluation Team would like to rate EWS project as **Highly Satisfactory Project**, given its performance as discussed above.

2.7 Success

The Project has changed the situation existed before its intervention although actual testing of this changed situation is yet to emerge. The real impact of the project could only be assessed in the event of a serious flood. However, the villagers refer to flood markers and billboards to get a sense of the situation as discussed above. This confirms that the project has been successful in achieving its objectives within the project period.

The following observations and facts reported further confirm the success of the project

1. 35 houses on the river bank of Taskor village/Lovea District/Kandal province moved their houses before the river bank erosion began as a result of flood warning provided by the RCVs
2. Villages in Kandal, Prey Veng and Kratie raised the level of their houses and have located high grounds for their cattle in preparation of the next years flood already in 2005 (Annual Report of ARC 2005). The villagers did not know the raising the ground until the project started disseminating simple methods of preparing for floods. During field visits the Team too observed the raised ground of the houses so the flood waters does not enter the premises.
3. Regular communication flow during the flood season is working effectively with few negligible exceptions of delays due to communication failures. The village flood marker readings are taken twice a day during the flood season and reported to head quarters in Phnom Penh by the village RCVs. There had been times that their ICOM battery was weak and therefore the communication got interrupted. There also had been instances where the e-mail was out of order, preventing the flood forecasts reaching the villagers.
4. School children were involved in a “Game Show” a quiz contest on public awareness on EWS and to review the questionnaires. The Children have provided correct answers. The Team met some school children during the field visits and involved them in informal discussions to obtain their views on EWS. It was revealed that the teachers provided information about the EWS during the school sessions and now they have developed the

practice of looking at the billboard while they pass the place where it is located. This is another effective tool for dissemination of information particularly to educate parents.

5. Use of resources available with other source e.g The video of OXFAM on Living with Floods” and radio time from ACF in Kampong Cham. This gives evidence to the fact the different agencies operating in the flood prone provinces of Cambodia have the will and the ability to cooperate in order to gain mutual benefits
6. The project provided training to ARC and CRC officials in areas such as Disaster Management, EWS, USAID Rules and Regulations. Particularly the RCVs met during the field visits showed their keen interests to serve her/his community with added knowledge as a result of training provided by the CRC. This is a readily available pool of human resources at the grassroots level that can make a real difference to the rural communities in the flood prone villages of Mekong River
7. Cross visits to Vietnam by ARC, NCDM and CRC officials enabled them to introduce Home Flood Markers demonstrating immediate results of the activity
8. Community fund raising for the continued operation of the flood forecasting tools reflects the need and therefore the ownership of the tool by the community. By First quarter 2006, 4 Provinces have raised Riel 1.919million. This is a substantive amount that reflects the ownership of the beneficiaries (1 Q 2006 Report). In addition the End Line survey revealed the willingness on the part of people to contribute money and labor for operation and maintenance of Billboards and flood markers
9. The villages adjacent to the 38 villages served with EWS have installed their own Flood Markers using the EWS information and made themselves prepared for upcoming floods
10. Some people have erected their own home flood markers by marking the one of the stilts of their own house.
11. The EWS tools are being replicated in the GTZ funded Component 4 of FMMP successfully having realized the importance of the tools as a flood warning method.

Chapter 3.0 : Sustainability

The sustainability of any intervention depends largely on three key parameters. These are the strengths of the outcomes of the intervention and the opportunities and challenges it needs to harness and overcome.

3.1 Strengths

The Evaluation noted that the following two major outcomes originally envisaged producing under the project, stand out strongly;

- “Useful and understandable MRC flood forecasts” based on information flows from the flood plain
- Flood vulnerable communities in Cambodia effectively respond to MRC prepared flood information

The first is the result of the effective cooperation between the two technical agencies namely MRC and DHRW. MRC has been producing Mekong river flood forecasts on regional basis since 1960. Similarly DHRW is in the business of producing flood forecasts based on the data from hydrological stations on the mainstream of Mekong for many years with the technical and financial support of many donors. However, these forecasts were distant to those who seriously in need of such information for their survival. These are the highly vulnerable people living in the flood plain of Mekong River. They were exposed to repeated risks in the annual as well as flash floods despite the presence of technically useful and more efficient tools, simply because of the gap between the supply of flood forecasts and demand for flood warning information.

The Project facilitated bridging this gap by improving the flood forecast as a tool of warning that is specific to the location of the flood plain on one hand and by preparing the vulnerable communities to understand the meaning of the forecast provided to them and thereby educating them to respond suitably on the other hand. The four-year operation of the project has brokered an excellent partnership (marriage), which hitherto did not exist.

The durability of this relationship is possible due to the following factors;

1. Commitment at the highest level of the Cambodian Government- Cambodian National Mekong Committee (CNMC) strongly emphasized the need to integrate EWS in the Commune Development Plan and thereby to incorporate it in the Five Year National Development Plan of Cambodia. Following the close cooperation and resulted partnership built during the project by ACF and ARC/CRC through the respective project implementation models, the next levels of the government institutional structure on disaster management i.e PDCM, DCDM and CCDM is harnessed to incorporate EWS. The EWS will be an essential component of the Commune Disaster Management Plan which will be included in the Five Year Development Plan of Cambodia, guaranteeing the financial allocation from the central government budget
2. The Cooperation Agreement that has been signed by MRC with CNMC and CRC gives assurance as to the continuation of the flood forecasts based on specific locations of the flood plain of the Mekong. The three objectives of this Cooperation Agreement envisage achieving continuous implementation of EWS, enhanced capacity of NCDM and CRC as the key owner of EWS and continuous maintenance of EWS including dissemination of flood warning information in the 40 villages hat

the EWS project was in operation from 2003. The present Agreement will provide funding support until November 2007 to achieve stated objectives.

3. The inclusion of the outcome of the EWS project in the two Components of FMMP i.e. Component 4 and 5 is a strong indication of its continuity. Component 4 has already replicated the flood markers and billboards in 17 villages in Kratie Province in preparation of flood preparedness plans. The Component 5 of FMMP is using village specific flood data in formulating land management activities. The usefulness of the spatially specific data initiated under the EWS project is priceless and highly critical for land management activities.
4. The presence of experienced implementing agencies too is a factor that ensures the sustainability of the project. ARC/CRC expanded its network through the project. Presently CRC has an extensive network of volunteers from the national down to the village level. More importantly the decentralized management that CRC introduced during the implementation process of the project is now in its operational mode. The officials and the volunteers of CRC have benefited from another USAID/OFDA funded project titled Community Based Flood Mitigation and Preparedness Project implemented in Kandal and Pre Veng Provinces of Cambodia by ADPC. This too adds to the capacity of CRC. The presence of dedicated and highly committed RCVs at the village level is a powerful asset that neither government nor any other international non-governmental agency produced so far.
5. More importantly the vulnerable communities who have changed their attitudes and behavior as a result of their realization of the importance of flood markers, information posted daily during the flood season on the village billboard and more specifically the warning that is announced by the RCVs demand the continuity of the project. This demand is strong in the remote areas of Stung Treng Province where other sources such as radio and television have not reached yet. This is therefore a healthy ground to sustain the achieved outcomes of the project.
6. The channel of communication established under the project to record and report the daily flood situation is another strength that will contribute to the durability of the project. The equipment provided under the project facilitated and strengthened two-way communication needed to produce flood plain specific forecast and also to convey the same to the target group on time enabling them to use it as an early warning tool.
7. The Provincial FM Radio of Kampong Cham assured to broadcast the flood forecasts and flood-warning programs developed through 92.5 MHz regularly even after the completion of the project.
8. The EWS tools developed and installed under the project are simple and easily understandable and therefore easily replicable. That is the reason for Component 4 of FMMP replicating the flood markers in the 17 villages it operates the project activities. The EWS has its on strength as a 'stand-alone' tool. At the same time it could be built into a larger picture of disaster management.
9. The PSCs established under the project in all 38 villages demonstrate higher-level commitment to support and maintain the EWS having realized its value and importance in the lives of the people in flood prone villages. The members of the PSCs being the leaders of these communities are keen to continue the facility.

3.2 Opportunities and Challenges

The momentum gathered as a result of the project is a good opportunity to harness its full potential. EWS is the foundation for the constructing of the larger building of disaster management within the FMMP. Having initiated the process by laying the foundation, the decision makers have been already demonstrated greater interest and commitment to institutionalize EWS in the general administration and development planning. The Cambodian government presently considers more specifically the need of EWS in the poverty reduction and disaster management strategies. The Sub-Decree issued by the government formally establishing CCDM the legal provisions are also in place to incorporate EWS in the Commune Disaster Management Plan, which is an integral component of Commune Development Plan. This window of opportunity is a significant indicator of the sustainability of the project provided the actors and partners of the project keep to their commitment.

There are several initiatives in progress within Cambodia to strengthen the capacity of people and their institutions to manage disasters holistically and also as an integral component of development. The outputs envisaged in the “Flood Emergency Management Strengthening” of FMMP (Component 4) could be another most appropriate opportunity. The ‘preparation and implementation of flood preparedness plans, national capacity development and conducting flood risk awareness campaigns’ will be more meaningful with EWS. Thus there is a great need to consolidate these stand-alone initiatives in order to optimize the benefits to the people who are vulnerable not only to floods but also other disasters.

The achievements of the EWS are presently confined to Cambodia. The EWS tools developed in Cambodia are simple and easily understandable. Therefore these tools could be easily replicated. There are no other tools with similar characteristics to provide easily understandable flood warning to the communities in the LMB. Given the nature of this client base in LMB for flood warning it may be a good opportunity to consider introducing the same in other member states of MRC.

However, there are number of challenges to the sustainability of the effort. These are presented below in brief;

1. The most serious challenge is the availability of funds. The repeated appeals for funding were made at the Handing over workshop by senior governmental officials of Cambodia. Specially the funding is critical during the period from now and until the government provides its central budgetary resources to Commune Development Plan in which EWS is incorporated. Assuming that the process of the preparation of the next Five Year Plan will be completed within a period of three years, there must be a source to finance the present level of operation of the project in order to sustain its achievements.
2. Equally important is the challenge to maintain the present momentum of the project. The implementing partners have tirelessly worked to make the project visible to the vulnerable people who are not the most educated and resourceful people of the country. If billboards are not daily updated during the flood season and presence of RCVs disappears the villagers particularly their leaders who have formed PSCs will certainly lose the confidence on the EWS tools provided under the project. Re-

building the same level of confidence of these vulnerable communities will need a heavy effort in many fronts.

3. The most critical factor in the EWS is the entire chain of operation. DHRW produces village based flood forecasts using the daily flood marker readings relayed by RCV through the communication channel. The same chain is used to provide the flood warning to the people. In order to sustain the project activities, it is highly critical to maintain the entire chain as a whole. This is the biggest challenge for the continuity of the project's achievement.
4. The cooperation among the partner agencies is a serious challenge that needs to overcome in order to ensure the durability of EWS. The sustainability of the above stated chain depends on this cooperation of partners.
5. The limited institutional capacity could be another challenge that needs attention in terms of sustaining the achievements. DHRW expressed the need to upgrade its equipment in order to produce quality flood forecasts. The communication equipment too needs to be replaced for efficient dissemination of early warning. More importantly the capacity of human resources should be kept updated.
6. FMMP has limited time left of its scheduled completion in 2010. It is a too shorter period to test the EWS tools and replicate the model in the entire flood plain of the Mekong River.

Chapter 4.0 : Conclusion

The project is fully relevant as far as its original objectives are concerned which remain still valid perhaps more valid tomorrow. More specifically the Project is highly relevant in terms of its target groups of vulnerable communities living in flood prone areas of Cambodia are concerned, the main development issue of risks to lives and economic and social assets of people due to higher than normal and flash floods it focused on are considered and also the direct beneficiaries that consisted of the project partners who are responsible not only for implementing the Project but, more significantly, for sustaining its positive results are taken into account.

Despite the minor deficiencies reported and also observed during the field visits, the overall performance of the project in terms of achieving its objectives and efficiency with which it has transformed project inputs into outputs within the period of its implementation is satisfactory. EWS has become an integral component of the Commune Development Plan, which ensures the sustainability of the outcome of the project. As a stand-alone project EWS has made a great success by generating the support to integrate it in the Commune Disaster Management Plan that will be incorporated in the National Development Plan through Commune, District and Provincial development planning process thereby opening a window of opportunity to commit national budgetary resources in future.

The project contributed to achieving the development goal of FMMP by providing a useful and understandable tool to the vulnerable communities, which will eventually help them in minimizing their sufferings and economic losses. It is already applied in the two components of FMMP, namely Component 4 Flood Management Strengthening and Component 5 Land Management. The EWS tools could be of use to other Components of FMMP too in order to optimize the benefits of FMMP.

The quality of some inputs and the timeliness of providing them could have been improved if the administrative procedures were conducive to the effective and efficient implementation of the project.

However, the strengths of the outcome of the project stands out to indicate its sustainability. There are number of opportunities to its replication as a model of EWS in other needy regions.

The overall performance of the EWS project is therefore be considered as highly satisfactory.

Chapter 5:0 : Lessons Learned

Number of lessons that were noted during the evaluation exercise are given below with the objective of sharing them with other partners.

1. A clear institutional arrangements and administrative procedures must be agreed upon and approved prior to the commencement of project activities based on a clearly developed and agreed Performance Management Plan. It is highly cost effective and more efficient if a period of minimum three months is allocated to plan the operationalization of the project between the signing of agreement with the donor and actual commencement of implementation of project activities.
2. The daily and weekly feedback form developed and used is an effective tool to record the details of project implementation. Particularly the data thus collected is of importance to other development practitioners in the flood prone areas of Mekong River.
3. The consolidation and pooling of resources is possible as demonstrated successfully under this project. The use of the video developed by OXFAM/GB titled “Living with Floods” by ARC/ CRC is a good example.

Chapter 6.0 : Recommendations

In view of the findings discussed above in detail the Evaluation Team would like to propose one principal recommendation. That is the following

6.1 Principal Recommendation

It is proposed that,

“External support to the provision of EWS to most vulnerable communities in the flood affected provinces in Cambodia should continue for a period of minimum three years”

The justification for this recommendation is presented below;

1. EWS provided under the project has not had the opportunity to test its effectiveness in a real flood situation. The next flood will be the first opportunity to test the real impact of the achievements of the project
2. The returns to the total investment of U.S.\$ 1,250,000 could not be realized unless the outcomes of this “stand alone project” is not fully integrated in the general government administration and planning process on the one hand and in the other components of FMMP on the other hand. Given the assurances and willingness expressed by the senior officials responsible for both Five Year National Development Plan and NCDM, incorporation of EWS in the National Plan and hence to provide central budgetary resources may involve minimum three years. Therefore there is a need to maintain the present momentum during this transition period of three years.
3. The target group has developed a sense of ownership of the EWS. They will continue to rely on the system to reduce their vulnerability.
4. The time is ripe to harmonize the two implementation models adopted by ARC/CRC and ACF to gain dynamic benefits. This is the institutional arrangement established at the national level with NCDM and at village level with PSC and the RCV by the ARC/CRC on one hand and the participatory process initiated in Kampong Cham at the Provincial level by ACF. The two arrangements adopted within the same project provided a good opportunity to anchor the project activities within the formal administrative framework
5. EWS as a stand-alone initiative has proved its success. However it will generate a multiplier effect if it is integrated with general disaster preparedness and management programs that are being developed and implemented in the flood prone provinces of Cambodia. It is therefore strongly recommended to provide spatially specific flood forecasts produced during last four years be made available to other development partners through web sites of MRC, DHRW, ARC/CRC and any other source enabling them to use this valuable data. This will facilitate in consolidating all the efforts aimed at reducing vulnerability of the communities in the flood plain of Cambodia
6. Given the usefulness of EWS in the macro goal of reducing the sufferings of people as expected in the FMMP, it is time to upscale the EWS to cover geographically a larger area namely the entire LMB and sectorally within broader Disaster Management.

6.2 Strategic Recommendation

The team would like to propose an additional strategic intervention to complement the principal recommendation. That is to consider concentrating the intervention to one Province and cover that geographical area intensively with the provision of EWS with modest interventions to improve the quality of life of the ‘End User’. This geographical area is Stung Treng Province.

This strategy is justified on the following reasons;

1. Stung Treng villages are located far away from mainland of the province. The houses are dispersedly located as the land plots are large in extent. The villagers involve in extensive agricultural practices, as the forestland is available for their expansion.
2. The people in these villages have no access to information, as they are located in remote villages with no radio or television coverage.
3. There are no signs of improved economic, social and living conditions of these people for considerable period due to their location.
4. Limited presence of other NGOs in these villages may be due to transport and travel difficulties.
5. CRC is a visible Civil Society Organization in the area with their committed RCVs.
6. The PSCs already established are strong and willing to continue their support to the project
7. Consider including further activities to anchor EWS strongly in the minds of the ‘end user’ by adding further activities to promote solar systems to provide electricity, primary health care and environment protection.

6.3 Supplementary Recommendations

If both of the above recommendation are accepted and a Phase II of the project is approved the Team would like to propose the following activities for the efficient operationalization of the Phase II.

1. Replicate the EWS in other critically vulnerable villages by integrating with ongoing interventions on Disaster Management
2. Upscale the present level of EWS by integrating longer term forecasts up to five (5) to seven (7) days.
3. Prepare a clear Exit Strategy as an integral component of the Phase II
4. Provide high quality equipment for DHRW enabling them to produce flood forecasts more efficiently and speedily
5. Share and integrate the data on flood plain flood forecasts with other Components of FMMP
6. Share the Results of the two Baseline surveys with other partners who are in the process of designing their interventions in flood prone villages of Cambodia
7. Clear all required administrative, financial and management issues prior to the commencement of implementation.
8. Enhance capacity of RCVs on simple flood forecasting techniques and Disaster Management

9. Encourage people themselves to have their own home flood markers particularly those who are living away from the bill boards. This may need further awareness enhancement on the need of such indicators and the risk of not having such alarms.
10. Find more effective and improved means of dissemination of Early warning. Billboard information should be simplified for an average villager to understand.
11. Encourage multiple sources of flood information by promoting access to radio, Television and even mobile phones by introducing solar power to supply cleaner energy to the villages in the flood plain that will not be served through a national grid for decades to come
12. Consolidate separately developed IEC tools and instruments for larger benefit and effectiveness e.g videos of ACF and ARC/MRC, leaflets, guidebooks, posters etc.

* * * * *

Scope of Work

I. Introduction

The Mekong River Commission (MRC) working in close collaboration with the American Red Cross and Accion Contre Le Faim, seeks an external consultant to serve as the Team Leader, to work closely with the Cambodia Early Warning System (EWS) final evaluation team to review and assess the Cambodia FEWS Project. Specifically, the Team Leader will facilitate the evaluation process as well as serve as the lead writer and editor of the final evaluation report. The final evaluation will focus on the project's life and will take place in March 2007.

The Mekong River Commission (MRC) initiated a five-year project in early 2003 entitled Provision of Flood Early Warning to Flood-Vulnerable Communities in the Lower Mekong River Basin under the Flood Mitigation and Management Program (FMMP). The total implementation budget is US\$1,250,000. The project goal is to reduce the vulnerability of communities to higher-than-normal annual floods and flash flooding.

Funded by USAID's Office of Foreign Disaster Assistance (OFDA), FMMP and its Center works in Cambodia with the American Red Cross (ARC) and Action Contre la Faim (ACF) as the main partners and the Cambodia Red Cross (CRC), the National Committee for Disaster Management (NCDM), and Department of Hydrology and River Works (DHRW) as the main Cambodian counterparts to achieve its goal.

The communities are located in five provinces bordering the Mekong River: Kandal, Prey Veng, Kratie, Stung Treng, and Kompong Cham. The total population benefiting from the information provided by the project is 55,979 peoples.

II. Purpose of the Final Evaluation (FE)

The final evaluation will focus on the impact that the project had on the communities and the sustainability of the flood early warning system within the communities.

The FE will specifically focus on whether:

- expected project outputs were achieved and the objectives accomplished;
- overall view of the relevance, effectiveness, efficiency and appropriateness of the project activities with respect to the larger FMMP program;
- transfer value to flood-at-risk communities in other parts of the Lower Mekong River Basin (and other basins) of sustainable tools and methods developed by the project, and
- To propose strategies for continuation of the early warning system process by responsible local authorities and replication of such activities in other high risk areas.

The FE results will be shared with the key government and non-government partners.

III. Background

In 2000, the lower Mekong River flood effects were unusually severe. As many as 10 million people were displaced (8.5 million persons were displaced in Cambodia and Vietnam alone), around 800 people (mostly children) lost their lives, and damage exceeded USD 400M. And in 2001, annual and flash floods were unusually severe, with high loss of life and property, and disruption across social, economic, and environmental sectors.

Immediately after the 2000 flood, the Mekong River Council—comprised of cabinet-level officials of the four riparian states of Thailand, Laos, Cambodia, and Vietnam—instructed the MRC Secretariat (MRCS) to prepare a Flood Management and Mitigation (FMM) Strategy using, a highly participatory process of interaction with National Mekong Committees (NMC) and line agencies in the four riparian states, the Civil Society Organizations (CSO), International Organizations (IO), Private Volunteer Organizations (PVO), and the donor community.

Although the FMM Strategy was a broad policy level document, it identified numerous activities that should be considered for future implementation. After the FMM Strategy was accepted by the Council at its meeting in Bangkok in November 2001, the MRC launched the formulation of an FMM Strategy Implementation Programme (FMMSIP) for consideration at the next Council meeting in Ho Chi Minh City, Vietnam in November, 2002.

In the process of formulating an implementation program, the MRC FMMSIP team grouped numerous flood-related activities within nine so-called FMMSIP components, which were consolidated into a final five that are listed below:

Component No.	Component Title
1	Establishment of a Regional Flood Management and Mitigating Center
2	Implementation Plan (Structure Measures and Flood Proofing)
3	Mediation of Trans-boundary Flood Issues
4	Flood Emergency Management Strengthening
5	Land Management

Notwithstanding FMMSIP preparation, the MRC is committed to strengthening the MRC Flood Forecasting and Early Warning System (FFEWS) that the Mekong River Committee began in the 1960s. Within the framework of FMMSIP components, FFEWS activities will be included in the first component.

IV. Evaluation Focus

The EWS project aims to reduce the vulnerability of communities in Cambodia to higher than normal annual floods and flash flooding. The goal will be met by providing timely flood warnings to the population in flood-vulnerable communities.

Communities have been provided with tools and training to allow them to reference their communities to MRC prepared flood information and forecast points in communities bordering the Mekong River. The establishment of a continuous dialogue and exchange of information between the communities and MRC has been carried on to ensure the accuracy

and appropriate applications of flood referencing information and assessment of community flood-warning needs.

The goal of this program was to be achieved through the following two objectives:

Objective #1: Develop useful and understandable MRC flood warnings, which are responsive to the needs of, and promptly conveyed to, the most flood-vulnerable communities in Cambodia.

Objective #2: Develop tools and methods, with the help of community-based implementing partners, to enable flood-vulnerable populations in Cambodia to effectively respond to MRC-prepared warnings.

Illustrative examples of activities to achieve these objectives include:

Objective	Activities
1	Communications technologies will be identified to convey MRC/DHRW flood forecasts and warnings from the MRC/DHRW to the community level.
1	Analysis will be undertaken to facilitate MRC/DHRW flood forecasts and warning becoming more geographic specific and timely, using Geographic Information Systems, and other analytical and communications technologies.
1	Partners will assist MRC/DHRW gain feedback from communities on the efficacy of forecasts and warnings, and means for their improvement.
2	The most vulnerable populations in Cambodia will be identified, according to their historical vulnerability to annual and flash floods.
2	Tools and methods will be developed to facilitate community based, flood referencing, based on their historical vulnerabilities.
2	Tools and methods will be documented in graphics-rich guidebooks in each of the riparian languages (and other ethnic dialects, if warranted) to enable MRC and partners to transfer lessons learned to additional communities.

The FE will address the critical issues and questions detailed in Appendix A, as requested under the USAID/OFDA Final Evaluation guidelines.

V. Methodology

The FE will use several methods to collect information and data:

- review of project data and information from the routine monitoring system;
- detailed document review (see below for list of documents);
- conduct endline survey to compliment baseline survey;
- key informant interviews with personnel, local partners including the NCDM, other organizations and stakeholders (see below for details); and
- focus group discussions that include beneficiaries, other community members and village leaders, and project support committees.

The FE will employ a participatory review methodology that engages project stakeholders in the review process not only as key informants, but also as reviewers. This approach will ensure that project staff and stakeholders will learn from both the successes and challenges encountered.

Team Composition: The FE team will consist of the following individuals: External consultant who will serve as the team leader, ARC Project Manager, ACF Project Manager, CRC Disaster Management Specialist Officer, Red Cross Volunteers and an independent translator, who has no association with the project. The FE team will conduct project site visits to interview key informants and conduct focus group discussions with project volunteers and beneficiaries as well as conduct endline survey.

However, during project sites visits the FE team will be divided into two separated working groups with following responsibility:

- Interview/discussion group: Consist of an external consultant who will undertake independent interview/discussion with project volunteers and beneficiaries; and a hired independent translator, who will collaborate with relevant project staff and serve the role of assistant; to assist with logistics, admin-related work, etc.
- Endline survey group: Consist of ARC Project Manager, ACF Project Manager, CRC Disaster Management Specialist Officer, and Red Cross Volunteers. The ARC Project Manager, ACF Project Manager, and CRC Disaster Management Specialist will provide a brief training session with RCVs to orient them on how to conduct the survey and submit the completed forms as well as monitor the progress of the endline survey conducted by responsible RCVs.

The Team Leader will lead a detailed document review of all project reports to prepare for the in-country planning sessions. Planning sessions will also focus on logistics (including finalizing site selection, organizing key informant interviews/focus group selection and endline survey questionnaires forms) and identify a detailed schedule and timeline for evaluation activities. Discussions will include the identification of sample criteria (types of persons to interview and include in focus groups).

Prior to conducting the country field visits, the FE team will conduct a detailed planning workshop to review critical questions and design and revise data collection instruments and key informant interview guides;

The baseline survey questionnaire and results will be reviewed to formulate the endline survey questionnaire by the team leader independently in consultation with responsible OFDA Program Officer(s).

At the conclusion of the site visits, the interview/discussion group will jointly analyze and synthesize the completed endline survey questionnaire forms, key informant interviews, and focus group discussions during a workshop. During this time, initial findings and recommendations will be identified independently by the team leader and shared with all stakeholders. Together with the FE team, the Team Leader will also facilitate the development of the findings, lessons learned, and recommendations of the evaluation.

Project Documents and Materials to Review

The following is a list of key project and other documents that will be reviewed:

- Project proposal
- Quarterly Reports
- Annual Reports
- Developed IEC materials
- Training materials and curriculum
- Meeting/discussion minutes or reports

Project Agreements
Baseline Reports

Key Informants Interviews

Key Informant interviews will be conducted by external consultant with the following individuals:

MRC office:

Project Officer, FMMP Coordinator, CNMC staff person, Chief Technical Adviser

ARC office:

Senior Regional Field Representative, Project Manager, Finance Manager

CRC office:

Project Officer, Disaster Preparedness and Response Director

ACF office:

Project staff

Government:

NCDM officer, PCDM and DHRW key staff

Focus Group Discussions

Focus Group Discussions will be convened in all of districts and will include the following:

CRC volunteers

PSC groups

The external consultant will also have interviews/discussions with village leaders, other relevant local government officials and households in the beneficiary villages.

Proposed Workplan

Total working day for final evaluation is 30 days included weekend days, to be started on 1st March 2007. The detail and exact workplan will be prepared by the FE team in cooperation with project implementing organizations. However, the work plan for final evaluation is drafted as follows:

Dates	Specific Tasks	Responsible	Level of Effort (# of days)
<i>Pre-evaluation planning</i>			
December/January	Develop initial terms of reference , qualification of external consultant and identify external consultants	Project team	—
February	Identify, recruit and hire external consultant and translator	MRC and ARC	—

	Collect all relevant project documents	Project team	—
	Develop workplan and begin in-country logistics planning for country visits	Project team and FE team	—
	Identify/finalize final evaluation team	Project team	—
March	Conduct document review	External consultant	1 day
	Develop initial data collection instruments (key informant questionnaires, focus group discussion guides and monitoring checklists) Review evaluation objectives, revise data collection instruments and finalize logistics	External consultant and project team	4 days
	Conduct HQ key informant interviews	External consultant and translator	2 days
	Conduct site visits (endline survey, key informant interviews, and focus group discussions)	FE team	9 days
	Data analysis workshop, present initial findings	External consultant	6 days
<i>Post evaluation visit</i>			
	Report writing	External consultant	6 days
	Provide feedback/comment on the draft report	Program implementing partners and related government entities (needs 1 week to provide feedback/comment)	-
	Integrate comments; finalize FE report	External consultant	2 days
TOTAL			30 days

VI. Minimum requirements for the consultant

- Demonstrable skills in project and team management
- Knowledge of flood-related issue at both a basin-wise and community levels
- Knowledge of community-based disaster risk reduction programs
- Relevant experience in Cambodia and Knowledge of Khmer is preferred
- For the previous three years, not been a member of any of the organization implementing the project
- Excellent oral and written communication skills in the English language.

VII. Key Deliverables

- 1.) Final workplan approved _____
- 2.) National headquarter key informant interviews conducted by _____
- 3.) Draft of data collection instruments completed by _____
- 4.) Final data collection instruments by _____
- 5.) Draft evaluation report by _____
- 6.) Final evaluation report by _____

Appendix A: USAID OFDA Guidelines, “A General Guide to the Construction of an Evaluation Report”

Appendix B: Information that can be used when developing interviews

Appendix C: Evaluation Handbook

Appendix D: Draft Endline Survey Questionnaires Forms

Work Plan of the Evaluation Mission

Time schedule From 4 March	Description	Responsibility
4	TRAVEL TO PHN / CAMBODIA	TEAM LEADER (TL)
5	Meet Project partners & discuss on broad scope of the evaluation Review EWS Project document and other material Prepare a detail Work Plan of the Evaluation Mission and share among the other Team members for their concurrence	TL
6	Draft questionnaire for Endline Survey to find out what changes have been made as a result of the Project Design separate questions to be used in interviewing Individuals /focused groups of project partners, target groups, beneficiaries including other actors in similar projects in the same thematic concern and /or spatial area	TL
7	Identify key stakeholders to be interviewed by the Evaluation Mission (EM) in PHN	Team Members(TMs)
	Arrange meetings with them from 9-13 March	TMs, Vandy, Lekhena
	Review and comment on the questionnaires	TMs
	Identify key stakeholders to be consulted at the Provincial, District and Commune levels	TMs
	Select minimum 2 villages in each Province for field visits (If more villages can be covered during field interviews/focused group meetings select additional villages)	TMs
	Prepare Field visit Plan to cover above groups during the visits to each location (Use a map)	TM,MRC/PRM.O,TL
	Communicate the Field Visit Plan to all stakeholders including RCVs and target beneficiaries	TL
	Arrange logistics for the field visits	Admin Assistant/Translator
	Meeting of the FE Team to finalize the Work Plan, Field Visit Program and the Endline Survey questionnaires	MRC/PRM.O & TL with TMs
8	Agreements reached with the FE Team to be finalized and shared among the Team Review documents and plan for consultations during field visits	TL

9 9.00 a.m.	Meeting with DHRW (Use Questionnaire No 3 as a guiding tool) Translate Questionnaire Draft minutes of the meeting Meet CRC in PHN	TL with TMs Translator/Admin.Asst. TM
3.00p.m.	Arrange other meetings with key stakeholders in PHN i.e.MRC,ARC Draft minutes of the meeting Provide additional reports and secondary data needed for the evaluation	TMs with TL TMs and Translator TMs and Translator TM TM
10-12	Review documents and meet officials of MRC to understand other ongoing programs that are relevant to the Project	TL
13	Travel to Kam Pong Cham	TL and TMs with Translator
14-15	Attend the hand over workshop in Kam Pong Cham Meet provincial ,District and Community level officials and partners as much as possible during the workshop	TL and TMs with Translator
16-27	Field visits to all Provinces (Details are given in Annex 1(a) Conduct Endline survey Compile data of the survey Prepare a summary of findings of Endline for each location surveyed	TMs, RCV TMs TMs TMs and Translator
28-29	Draft the Evaluation Report Provide additional inputs to the Evaluation Report	TL TM
30	Arrange a consultative meeting in PHN to present evaluation findings and recommendations to the key partners of the Project Present the draft Executive Summary with findings and recommendation in brief	MRC and TMs TL
31	Travel out of PHN	TL
1-4 April	Receive comments on the Draft FE Report via electronic mail and work on the final report of the evaluation on Home based arrangement	TL TL
5 April	Submit electronically the soft version of the Draft Evaluation Report	TL

Note:

1.The International Consultant will work on the Finalization of the FE Report while waiting for the comments of the project partners until 5 April. This will need minimum 5 working days on home based arrangement.

2. This Work plan was endorsed by the Team Members of the Final Evaluation Mission at the meeting held at 2.00 p.m. on Wednesday 7 March 2007.

Annex III

Persons Consulted during the Evaluation Process

Organization	Name	Designation	Contact details
USAID/OFDA	Mr. Robert Barton	Regional Advisor for Asia & Pacific	USAID, Regional Development Mission/Asia, GPF Vitthayu Tower A, 93/1. Wireless Road, Bangkok 10330, Thailand Telephone 662 263 7459 Email: rbarton@usaid.gov
	Ms. Fiona Shanks	Manager-Information Support Unit	1201, Pennsylvania Avenue, NW, Suite 200, Washington, D.C.20004 Telephone 202 661 9309 Email: fshanks@usaid.gov
MRC	Mr.Nicolaas Bakker	Chief Technical Advisor	MRC (RFMMC) P.O.Box 623,Preah Monivong Boulevard, Phnom Peng, Cambodia Telephone 855 23 726 622 ext 2090 Email: bakkar@mrcmekong.org
	Mr.Bob Pengel	Technical Advisor Component 1	Address same as above Telephone: 855 23 726n622 ext 1012 Email: pengel@mrcmekong.org
	Dr.Chusit Aprirumanekul	River Forecasting Expert	Address same as above Telephone: 855 23 726 622 ext.1016 Email: Chusit@mrcmekong.org
Water Resources & Flood Management Consulting, LLC	Mr.Richard Paulson	Principal	7896 Hart Glen Court, St.Michaels, MD 21663, USA Telephone: (410 745 2060) Email: Richard.w.paulson@earthlink.net Richard.paulson@noaa.gov
Asian Disaster Preparedness Center	Mr.Thanongde th Insisingmay	Program Manager(DMS)	RFMMC, MRC Secretariat,364,Monivong Blvd, Phnom Penh, Cambodia Telephone: (855 23) 726 622 Email: Thanongdeth@adpc.net
Cambodia National Mekong Committee	Hon.Taing Eng	Secretary General	
Organization	Name	Designation	Contact details
National Committee	Mr.Pon Narith	Director General	

for Disaster Management, Cambodia	Mr.Chheav Nak	Assistant to the first Vice President of NDMC	274, Blvd Preah Monivong, Phnom Penh, Cambodia Telephone: 023 211 030 Email: nak.ncdmewn@everyday.com.kh cheavnak@yahoo.com
Department of Hydrology & River Works	Mr.Yin Savuth	Chief, Research & Flood Forecasting	
	Mr.Sin Cham	Provincial DH&RW/Stung Treng Province	
Cambodian Red Cross	Mr.Duch Sam Ang	Project Officer/Flood Early Warning System	CRC-EWS, 3 REo, St.180, Phnom Penh, Cambodia Telephone:855 23 224 027 Email sam_ang.crcews@everyday.com.kh dsamang@yahoo.com
	Mr. Doeu Saram	CRC/Kampong Cham	
	Mrs.Keo Chanareth	CRC/Kampong Cham	
	Mr.Chong Cheynuon	CRC/Kratie Province	
	Mr.Kim Vuthak	CRC/Stung Treng Province	
	Mr.Soeun Doeun	CRC/ Stung Treng Province	
American Red Cross	Mr.Ven Sarith	EWS Program Manager	19,, Street 352, Boeng Keng Kang, Chamkar Mon, Phnom Penh, Cambodia Telephone: 855 23 211 996 Email: vsarith.amcross@everyday.com.kh vensarith@yahoo.com
Action Contre la faim	Ms.Sandrine Roussy	Project Manager	Kampong Cham
Department of Information	Mr.Chea Kruch	Kampong Cham Province	
Provincial Committee of Disaster Management (PCDM)	Mr.Suy Vanno	Stung Treng Province	
Community Committee of Disaster Management (CCD)	Mr.Phauk Boeun	Chief/CCDM Kratie Province	

End Line Survey

Purpose:

The purpose of the End Line Survey is to find out whether and to what extent the intended changes to the identified problem (s) at the baseline situation took place as a result of the intervention (Project).

Note: This exercise needs not be a full-scale survey similar to the baseline. It should serve the purpose of the Final Evaluation (FE). The questions framed below are designed to serve that purpose. It may not be possible to obtain quantifiable data to illustrate the success or failure of the Project through this survey. However very pertinent qualitative information will emerge to ascertain the relevance of the Project, its effectiveness, the efficiency through which the inputs of the Project were transformed into outputs, the sustainability of the achievements of the Project and also lessons that can be shared with others as guiding principles and tools in further intervention.

Different questionnaires are designed to achieve the above purpose focusing on each stakeholder of the Project that includes the following groups;

Targeted beneficiaries i.e vulnerable communities/villagers
Service providers at village, District, Provincial and national levels i.e RCVs, DOs, SBOs, CCDM, DCDM,PCDM, NCDM, CRC, ARC, MRC etc.

Questionnaire No 1: Questions to be used during field visits to selected villages of all five Provinces

1. What are the Early Warning signs installed in your village?
2. How many of those signs are in your village?
3. Were you consulted/ involved in identifying the locations for the flood markers in your village
4. Are these installed in correct locations?
5. When did you last look at these?
6. When would you look at it if you have not seen it yet?
7. Do you understand the flood markers?
8. Who informed you of these EWS?
9. Are the Bill Boards updated regularly?
10. Are there Safe Areas in your village ?
11. Have you seen EWS Guide Books, booklets, posters, flood hazard maps?
12. Have you been consulted by RCVs, DOs or DMD staff after the last floods?

13. What are the other means of getting flood warnings in your village? i.e Radio, TV. Friends etc. Please specify
14. What is better in warning you of floods Radio and TV or Flood Markers, Bill Boards and Alarms?
15. Any narrative description as to the achievements of the Project as perceived by the villagers

Questionnaire No 2: To be answered by all RCVs in 40 villages

1. What are the documents of EWS Project that you use in your daily work? Name these documents?
2. Do you have an Individual Performance Plan for your work?
3. How much time you spend average per week in implementing EWS project activities in the village that you are assigned?
4. How many EWS installed in the village you work? Give number of each sign e.g Flood Markers.... Bill BoardsSafe Areas
5. Do you use a village map in performing your functions?
6. How do you keep records of your daily activities? i.e Use a field note book, Use a diary, use loose papers
7. How regularly you report to your supervisor? Weekly/monthly/quarterly/annually
8. Do you go through the village leaders when you communicate with the villagers?
9. What are the most accepted EWS in your area by the people?
10. Do people use these EWS prior to flood season? What evidence you can give?
11. Are there any damaged/ destroyed Flood Markers in your village?
12. How many people in the flood prone areas attended dissemination meetings on EWS?
13. What deficiencies you observe in this EWS? Specify.
14. What do you propose to overcome these deficiencies?
15. What do you recommend further to maintain the progress achieved under the Project?

Questionnaire No 3: To be used as a guidance at the discussions with officials at the national level

1. Do you consider that the EWS Project correctly addresses the issue of absence of Early Warning Systems and related issues? Explain your views.
2. What is your overall assessment as to the effectiveness of EWS Project?
3. Do you think that the Project has been implemented according to the agreed plan?
4. What constraints/problems encountered during the implementation of the project? Please highlight these concerns.
5. What extent you were involved in the Project management process?
6. What are benefits of the Project that you consider as outstanding ?
7. What are the serious mistakes that you are aware of the Project?
8. What do you propose to overcome the above deficiencies? Please specify
9. What do you propose to continue the operation of EWS in future in the villages that the Project delivered such assets after the donor funding is over?
10. Do you think that the Project outcomes could be replicated in other spatial areas which are prone to floods?
11. Would it be possible to use same tools but to provide Early Warning to other natural hazards i.e droughts in Cambodia

Field Observation Report

By Manel Jayamanna - International Consultant/Team Leader

Introduction

The purpose of this additional input to the Evaluation Report is to provide location specific observations in order to supplement the evaluation report. The report was compiled after each days field work so that some of the observations are not lost in the memory.

The field visits were extremely tiring and exhaustive. The heat during the day was unbearable. The sudden rain started on 19 March 2007 made the travel further difficult. Long distance of walk through the villages and some time in motor cycles through paddy fields and village foot paths were very exhaustive. Added to that was the environment. The co-existence of people in complete harmony of their livestock in dusty compounds was a new experience. The travel to villages in Steng Trung Province was particularly exiting experience as the team leader never had any opportunity of traveling in over crowded boats with livestock, vegetables, gasoline etc. in addition to people and their motor cycles, bicycles, karaoke equipment etc. Despite the scaring rattle of the old motor of the boats, the journey through the waters of Mekong enabled to observe yet another world hitherto unknown to the team leader.

Kampong Cham Province

The two villages visited are the areas under ACF implemented component of the project located on the right bank of Mekong River. Population in one village is predominantly Muslims while the people in the other village are Khemer Buddhists. The close proximity to the city of Kampong Cham has greater influence on the life style of the community. The main transport mode is the motorcycles and bicycles while there are motor cars too entering the villages. Many people have access to modern communication means such as mobile phones, radio and television.

Houses are concentrated on both sides of the road making information sharing is fairly easy and faster. The billboard and the flood markers are located in the compounds and the paddy fields of the RCVs. These locations also are central to the houses in the villages. Both villages were holding functions of their respective religions at the time of our visit. The use of loudspeakers as a tool to address the public is the distinct feature I noted.

It was learned that Chatting program over the FM channel of the Radio is popular in the Province given the use of mobile phone by the people particularly the youth. The Department of Information is capitalizing this opportunity to broadcast flood risk reduction related information and awareness programs. The strong partnership between ACF and the Dept. of Information has produced an innovative initiative to reach vulnerable communities with information on flood risks.

The strong support extended by Mr.Chea Kruoch, Deputy Chief of Dept. Information in dissemination of flood forecast through the FM channel of the radio is commendable. However, there are two significant challenges he needs to address. One is the technical issue. The present technical capacity of the radio station is limited. As a consequence there have

been breakdowns of the broadcasting sessions preventing the radio to provide timely information to the people. The other issue is the need for authentic information on flood warning. Presently the radio transmits the flood forecast sent by ACF and CRC. Unless such a responsible and official information is received, the radio is unable to broadcast flood forecasts of any other source.

This indicates the need to continue the flood forecasts by formally accepted institutions. It is therefore suggested that MRC and DH&RW should continue to provide flood forecasts to local radio stations given the increasing access of the people to modern form of communication network i.e mobile phone, radio and television.

Kratie Province

The houses visited in the villages of Kratie Province are located on both sides of the road within close proximity to the Kratie city. The villages have mixed features of predominantly rural but with urban influence. The co-existence of people in complete harmony with their livestock makes the living environment very unique to these villages. The presence of large number of children below five years in this living environment was noted with concern. It is hard to observe the prevailing hygienic practices in the presence of vast volume of fresh water of Mekong River.

The villagers were busy with harvesting and also campaigning for the commune elections scheduled to be held on 1 April at the time of our visit. The use of loudspeakers was very prominent. In addition to the political campaigns with loudspeakers the religious and wedding functions also use this mode of public address system. The use of car batteries to power these systems and recharging the batteries every other day is very significant. The batteries are re-charged using diesel powered motors. This is an excellent opportunity to introduce solar systems to charge batteries and also to provide home solar panels so the people have access to electricity with renewable source of energy. The electricity through a national grid to these villages will be a distant star that will not be reached for next couple of decades. The long period of dry season averaging eight months of the year provides excellent opportunity to promote this technology.

Stung Treng Province

The villages served with EWS are located on the left bank of Mekong River. Only access to villages at present through boats. These boats are overcrowded with people, animals, petrol cans, motorcycles, bicycles and many other things. There is a bridge being built across Sekong River, a large tributary of Mekong. With the completion of the bridge, access may be possible through roads in future.

These are typically rural villages of the country. Only means of transport within the villages is by motorcycles and bicycles. The team used hired motor cyclists to visit some villages served with EWS. The houses are scattered in a vast area even encroaching to the natural forest. There are number of small streams dried at present but get filled up with surface water from rain as well as from Mekong river flood water reaching up streams dividing villages into small islands. The dried streams at the time of our visit are very deep. The only way to cross these places is to go down the ravine through powdered soil which is slippery or to walk on a trunk of a tree placed on the two banks of the dried stream. Both means were equally difficult and no words to explain the danger.

The main occupation in these villages is agriculture including livestock at the subsistence level. However, there seems a surplus that is taken to the markets in the city. Fishing is largely for domestic consumption.

One billboard is located at the entrance to the village and the others along the road. One flood marker was observed in a paddy field. The billboards and alarm boards provide a great visibility to USAID/OFDA, MRC and CRC. The presence of any other NGOs or INGOs was not observed in these villages. Only exception is the few protected wells with had pumps provided by UNICEF and billboards with hygienic practices i.e drink boiled water, wash hands etc. However there are no signs of these practices that could observe during my visit. There were few home gardens cleanly kept but majority is not cleaned. One special feature observed in these villages is the manner they cook their food. There are makeshift open hearths built in the garden. The women cook food using firewood. As the firewood is available within the vicinity the inefficient burning is not an issue. The type of tools used in cooking, particularly local noodles, is noteworthy. This noodle maker requires four people to press the dough made out of rice flour through a container with holes into a container with boiling water below. This preparation takes lot of energy and the time of women including little girls in the family.

The manner the child deliveries take place in the villages is noteworthy. Almost every baby is delivered at home with the assistance of the local midwife. Most of the families are large with even ten children per family born. Of the ten children born to one of the families interviewed for the End Line survey only six survived. The age of the mother is only 40 years implying that she may deliver minimum two babies in her present reproductive capacity.

It may be of long term benefit to undertake a research study on the role of women including little girls in the rural economy and social life in the flood plains of Cambodia.

Kandal Province

This province is located very closer to Phnom Penh and therefore the movement of people to the city is very close. The villages were reached by ferry and then by four wheeled vehicles. The roads were slippery due to the rain. The houses are large and densely located. The villages seem more sub-urban cities than rural villages. Many people commute to and from Phnom Penh for work and for trade. There are young school children attending higher grades in the schools of Phnom Penh.

Many have access to radio, television and mobile phones. The use of car battery as a source of energy is predominant.

The women were busy in processing reed as this is the season to harvest this particular variety. The processed reed is either sold as a raw material largely for export to Vietnam or turned into mats.

The donkey driven carts are used extensively to transport heavy loads within the area.

Prey Veng Province

Another difficult area to visit having taken the ferry at Neuk Leung. The accommodation was extremely poor but no choice I understand. The villages were reached by boat and then

on hired motorcycles, the only mode of transport within the area, through muddy meadows and slippery footpaths.

The villagers were busy trying to save their harvest from the unexpected heavy rain. Here too the use of radio and television seems increasing. I observed two sets of radios being taken by two people who took the boat with us.

General Observations

1. Most of the villages selected under the project are predominantly rural but with few urban features in four out of five provinces. The urban features are the use of mobile phones, radio and television. The villages in Stung Treng province are the most rural and difficult area in the EWS project with no other source of information on floods except bill boards and RCVs who are given communication equipment under the project.
2. There is a significant visibility to USAID/OFDA, MRC and CRC through billboards, alarm boards and other IEC material
3. The temples/pagodas are always located in high area of the villages making these places safe areas during floods for affected communities. These are large and prosperous buildings that accommodate almost every one affected.
4. The sound system attracts people making it a powerful means of reaching the people. That is why when RCV announces the flood information people hear it and understand it better than reading or looking at the billboard.
5. Women serve multiple roles in the family and also in the economy and social life of the village.
6. The heavy use of batteries for powering radios, televisions and even lighting the houses provide an excellent opportunity to promote solar systems which is clean energy. This will certainly enhance the quality of life of the rural people.
7. There is a greater need to promote general hygiene and health care, particularly among children.
8. Environmental deterioration is overwhelmingly alarming with the use of plastic and polythene and the manner they are disposed of. The Mekong River carries plastics and polythene scattered in the villages stressing the importance of managing this substance.

Report of the End line Survey

Introduction and Rationale

The Scope of Work (SOW) of the Final Evaluation of the Provision of EWS to Flood Vulnerable Communities in the LMB envisaged conducting an End Line Survey to complement the base line survey that had been carried out during its operational phase. A draft End Line Survey questionnaire was given as an annex in the SOW.

The Evaluation Team reviewed this draft and found that it was identical to the questionnaire that has been used at the Baseline survey. The Evaluation Team therefore was of the view that the questionnaire has limited utility value for the purpose of the Final Evaluation which aimed at finding out whether and to what extent the intended changes to the identified problem (s) at the baseline situation took place/ happened as a result of the intervention (Project).

The End Line Survey does not need to be a full scale survey similar to the baseline. It should serve the purpose of the Final Evaluation (FE). It therefore should be specific in its focus and should complement the evaluation findings by way of specific indicators of the projects achievements and also to frame concrete conclusions and recommendations

The questions for End Line survey were therefore designed to serve that purpose. The questionnaire thus developed is given in *Annex 4.a*. This was used during field visits of the team to 20 villages in all five Provinces where the project is being implemented to obtain a feedback from 223 respondents. The questionnaires were filled by the four members of the Evaluation Team in all four provinces of Kratie, Steng Trung, Kandal and Pre Veng whereas the surveys in Kampong Cham province was conducted by the officials of ACF and RCVs. Average of thirty to forty five minutes were spent with each respondent to extract information to fill the questionnaire. The members of the Team used this opportunity to enhance the awareness of the respondents on EWS and promote the villagers to understand the importance of EWS in order to be prepared for disasters. This is certainly an additional benefit of the End Line Survey that should be added to the achievement of the project.

In addition to the quantifiable data to illustrate the success or failure of the Project through this exercise the survey envisaged that very pertinent qualitative information to be emerged that would support the relevance of the Project, its effectiveness, the efficiency through which the inputs of the Project were transformed into outputs, the sustainability of the achievements of the Project.

The results of the survey in quantitative terms are summarized and presented in *Annex 6 (a)*. This report contains the analysis of the End Line Survey Results.

Effectiveness of the project

The MRC flood warnings are the flood forecasts produced by DH&RW using flood marker readings relayed by the RCVs of each village through the communication system established vertically from village to the center in Phnom Penh. The warning is posted to the Billboard located centrally in each village enabling the people to refer to it during the flood season. Therefore flood markers and billboards are the means that villages would understand the MRC flood warning. That is the major outcome of the project, namely useful and understandable MRC flood warning tools.

Of the 223 respondents, 199 were aware of the flood markers installed in their villages while 201 were aware of the billboard. This indicates that 89% of the people in the villages are aware of the flood markers while 90% knew about the billboards. Even though the majority of them, nearly 57% were not involved in identifying the locations for installing these referencing tools, there had been a serious attention to the tools as reflected in their high degree of awareness. That indicates the effectiveness of the project which gives the extent to which the project outcomes has reached its target groups.

As far as the locations of the EWS are concerned 74% of the respondents expressed their satisfaction. The Billboards are installed next to the RCVs houses or public places such as pagodas, schools, entrance to the village from the boat landing place. The reason for the billboard next to the house of the RCVs could be justifiable as s/he is responsible in posting the flood forecasts daily to the billboard in addition to providing house to house information service using the public address system and reading and relaying the flood level at the flood marker. The role of RCVs seems highly labor intensive particularly during the flood season. S/he too is one of the vulnerable people who have her/his own responsibility to respond to the floods.

The people normally look at the billboard during the floods according the survey results Nearly 59% of the responded look at the billboard during the floods whereas the number is less i.e 37%, before floods. The number reduces to 23% once the flood situation recedes. It is interesting to note the number who never looks at the billboard. Overall it is negligible as it stands only 21% of the total respondents. This is mostly due to the presence of other sources of flood information, distance to the billboard from his own house, reliance on neighbors to read the billboard on ones behalf and more importantly the dependency on the RCVs to provide the information in case of alarming situation.

Another indicator of the effectiveness of the project is the answers given to question No.6 of the questionnaire. When the question was raised whether they understand the information in the billboard, 57% answered positively. This is a significant achievement given the short period of four years of project implementation. The answers to the question No 7 elaborate this further. Of different water levels marked on the billboards, respondents were more concerned over the Today Water Level (44%) followed by Village Flood Level (40%). The alarm color reflected on the billboard is important information that the people are concerned with.

Efficiency of the Project

The End Line survey did not expect to obtain any feedback from the target group on the degree to which the project inputs were transformed into its outputs. However, question No. 9 of the questionnaire was framed to obtain an idea as to the efficiency of one input, i.e Information, Education and Communication (IEC) material provided under the project. This too was limited to three items of IEC, namely flood hazard leaflets, EWS Guidebooks and Flood Hazard Posters. As many as 58% of the respondents had seen the flood posters and 54% had seen the hazard leaflets. The EWS Guidebooks were not meant for the target group but for the trainers. There had been a delay in producing these IECs as reported in the progress reports.

Another indirect indicator of the efficiency of the project is the percentage of people who depend on the RCV to provide flood information during last three years. Nearly 82 % of the responded categorically said that they rely on RCV to give the flood warning. The RCVs has used the public address system provided under the project to announce flood situation during the flood season. Despite minor breakdowns of speaker systems reported, RCVs have used the system to inform people of the floods.

Sustainability

68% of the respondent confirmed that they continue to rely on billboard information for flood warning. They therefore are willing to operate and maintain the system with their own money and labor. The higher degree of willingness to contribute money and labor reflects the strong desire and therefore the demand for this simple but effective tool. It is closer to their home and easily understandable.

Similarly the perceptions of the people seem to have changed as reflected in the higher percentage (76%) of respondents who do not believe in traditional flood warning. This number was 43% in the Baseline survey conducted in 2003. This reveals that the people do increasingly understand more scientific information and not necessarily rely on traditions and mythology if scientifically processed information is available.

The degree of dependency on the EWS demonstrated in the presence of other sources of flood warning such as radio and television indicates the people's desire and hence the demand to sustain the system. As the demand alone is not a sufficient condition to ensure sustainability, the supply side of the equation needs to be matched.

List of Indicators

1. Percentage of the villagers who are aware of EWS in their own villages
2. Percentage of villagers refer to billboard during the floods
3. Percentage of people who understand the information in the billboard
4. Percentage of people who would like to know billboard information before floods and after floods
5. Percentage of people who depend on EWS to protect their crops, livestock, children and houses.
6. Percentage of villagers who have received flood hazard Information, Education and Communication material
7. Total amount of funds raised for operation and maintenance of EWS as of 30 March 2007
8. Percentage of villagers who expressed their willingness to support financially to maintain the EWS
9. Percentage of people who do not rely on traditional flood warning as a result of EWS established in their villages
10. Female volunteers as a percentage of total volunteers working in villages